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# MEASURING THE VALUE OF OPEN ACCESS ETDS IN ALGERIAN DIGITAL REPOSITORIES: AN EVALUATIVE STUDY

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## **Abstract**

Over the past years, grey literature in general and electronic digital theses (EDTs) in particular have been becoming more and more digital. Algeria is ranked first among Arab countries with fifteen (15) digital repositories. EDTs represent a large percentage of the repositories' content. Fourteen (14) of these repositories have policies for the collection of theses and dissertations, as well as other types of documents such as articles and reports. The usage of EDTs by undergraduates has been increasing exponentially. This study aims to highlight and evaluate

the tools used to measure the usage of ETDs in the digital repositories, their availability and the evaluation methodology.

## Keywords

Digital repositories, usage statistics, ETDs, open access, grey literature, evaluation of ETDs, University of Constantine 2.

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## Introduction

"We cannot call a digital library or electronic publishing system a success if we cannot measure and interpret its use". (Bishop 1998).

Digital repositories have made significant changes as regards the publishing industry and scholarly communication over nearly two decades, nonetheless institutional repositories (IRs) have a conflicted history in terms of purpose despite being always closely associated with the open access movement and the publishing of research produced by universities through academic community members.

IRs have a significant role in providing visibility for the research outputs of the academic community, both locally and internationally. Algeria, with fifteen (15) digital repositories registered in the OpenDOAR directory, is ranked first in the Arab countries for its high number of institutional repositories. 46% of these repositories are using metrics such as Google Analytics. However, the fact remains that some repositories have already been launched and exist yet are not registered in international directories like OpenDOAR or ROAR. These projects have been launched since 2013 with the aim of increasing the ranking of the universities by providing visibility to their publications at an international level.

Many digital repositories have been undergoing technical issues affecting their visibility and web presence. A study conducted by Hachani (2017) about the web presence of three countries in the Maghreb, namely Algeria, Tunisia and Morocco, concluded that these open repositories do not seem to implement a clear open access policy as most of them restrict access to registered users, which contravenes the essence of open access philosophy allowing access to scientific literature, and this has negatively impacted the performance of those repositories and the ratio of their open access literature. This seems to be the reason why users are not using or discovering these tools.

Bouderbane et al. (2018) indicated that 80% of the sample respondents, consisting of university teachers in Algeria, mentioned that they "rarely" use grey literature in their information searches because of the tremendous obstacles they face when attempting to use these resources, while 15% of them affirmed they "never" used grey literature documents in their research because of the harsh and complex environment surrounding these specific resources. However, the different understandings of the term 'use' represent a challenge to clarifying what the term can be considered to mean. At institutional level, "popular" metrics (tweets, Facebook shares, mainstream media mentions, etc.) can be appreciated in terms of public relations. It may be difficult for library administrators to see the value in popular metrics

beyond marketing, but item level metrics are more and more important today for scholars and, to some extent, academic departments because scholarly exchanges are increasingly taking place via online networks, including social media platforms (Lavoie et al. 2014).

This emphasizes the importance of metrics in giving different understandings of use through tweets, Facebook shares and mentions), which can be a useful reference for information seekers in the social web. Repository managers can take advantage of these new metrics to meet the different needs of stakeholders and communicate with them. Different metrics serve different needs of stakeholders in the academic community, leading to continued use of repository services and benefits from their content in terms of access, sharing, use and reuse. This whole activity can also be tracked, assessed and counted to increase the value of the content - especially grey literature such as ETDs - and faculty research, as well as other types of content. Altmetrics - new tools to measure impact in the social web - can add more usefulness to how the value of ETDs and other IR can be increased and assessed. As of 2014, only 9% of repositories collected and displayed altmetrics or citation metrics for their content. These repositories tend to source their altmetrics data from Altmetric and PlumX (Rehemtula et al. 2014). Many IR platforms track usage statistics "out of the box" (Konkiel and Scherer 2013). Pageviews and downloads are commonly reported on public-facing pages, while systems track and privately report other useful information (top search queries, unique visitors, etc.) to system administrators or individual authors. This might be a good option for IRs that do not issue permanent identifiers like Handles or DOIs - they could monitor social media sites for mentions of relevant URLs instead. Measuring the success of any online collections and physical collections, and collecting and interpreting these numbers in an assessment tool to gain new insights about collections and user attitudes are top priorities for any repository manager. Metrics are necessary for repository managers in assessing the services they provide to their university community. For a young repository, generating quick metrics is essential (Gibbons 2013).

Digital repositories collect many different types of statistics to add value to their collections of ETDs and increase their usefulness as rich scholarly resources for improving the quality of and disseminating research for undergraduate students and the whole research community. The integration of download metrics and social media tools might strengthen their already significant impact and make them a good choice for repository managers to better communicate with different stakeholders in the community, although both aggregators provide varying degrees of important qualitative data behind the numbers they report. For example, in addition to seeing that items in your repository have been mentioned 17 times on Wikipedia, you can also see exactly what has been written about them. PlumX, however, does report some metrics that do not have the underlying qualitative, auditable data available for review (Konkiel et al. 2015) due to the increasing importance of the social web in giving more insights to research and going beyond numbers to ways to assess and measure the impact of different types of IR content.

## **Methodology**

Content analysis of the Algerian digital repositories has been adopted as an evaluation tool to assess the metrics used to evaluate electronic theses and dissertations with a sample size of twelve (12) repositories out of the total number of fifteen (15). Three were excluded due to technical problems. The approach sought to analyse the metrics used to increase the value of

the electronic theses and dissertations through the observation method, which was used to observe each repository with its metrics, and to analyse and evaluate the different metrics used to increase the value of the ETDs in each of the repositories.

The following repositories were examined and evaluated according to the commonly used repository metrics mentioned below:

- Item downloads
- Number of items in the repository
- Item uploads
- Location of visitors
- Participating units
- Participating faculty

Note\*: other metrics also have been analysed and mentioned besides those mentioned above:

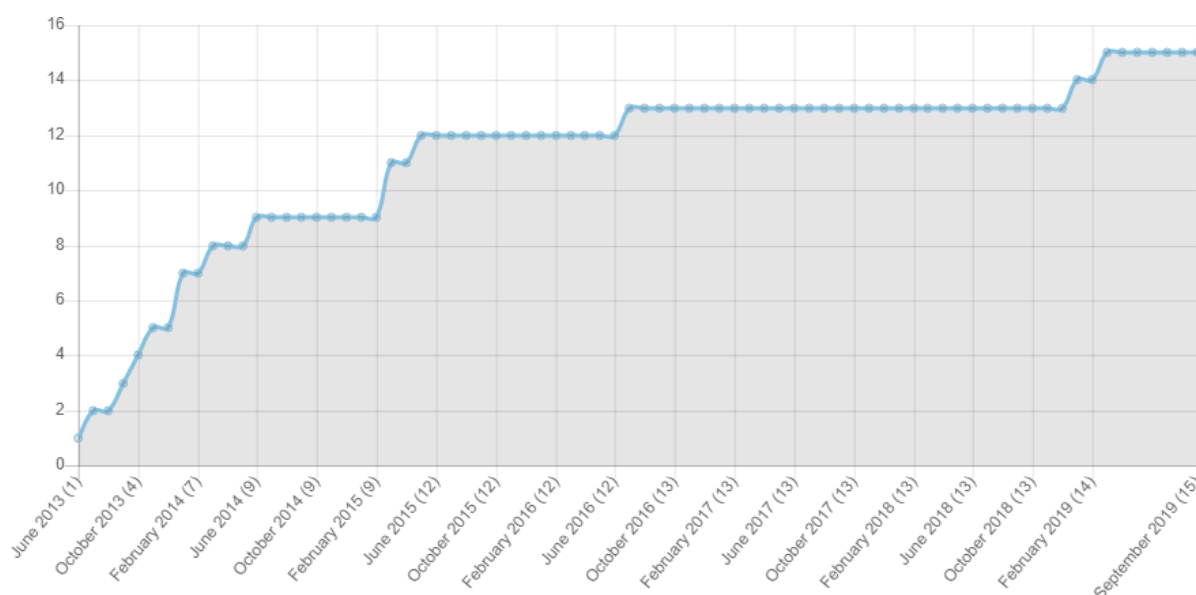


Figure 1: The growth in digital repositories in Algeria (OpenDOAR, 2019)<sup>1</sup>.

## The Development of the Algerian Digital Repositories

Digital repositories of the Algerian universities began to be established from 2013. Fifteen (15) repositories have been registered as of September 2019. The main purpose of those projects is to disseminate and facilitate access to the research outputs of the universities and research centres in the country. The different information resources being uploaded to the repositories are of huge importance to support the education in the universities and also the academic community. In order to make this work, achieving high visibility in the usage of the digital theses and dissertations is paramount. Moreover, ETDs have been extremely important in conducting research and, as rich information resources, ETDs tend to overcome many obstacles such as the growing size of paper dissertations and the related shortages of available storage capacity at traditional libraries, the difficulties in reporting and assessment the impact of those

<sup>1</sup> OpenDOAR [.https://v2.sherpa.ac.uk/view/repository\\_by\\_country/dz.default.html](https://v2.sherpa.ac.uk/view/repository_by_country/dz.default.html) (accessed 13 September 2019).

resources, and the need to provide access to the old theses and dissertations, which are a memory heritage for both the institutions and the users.

Nowadays, theses and dissertations exist only electronically (as ETDs); it is often the IR that preserves and provides access to this valuable scholarly and institutional literature. In addition, the IR can provide support for a wide variety of “supplementary” files for ETDs, crucial information which, because of its format, cannot be included in the PDF submitted to ProQuest. These files often include datasets, software, and multimedia content, as well as research protocols in the case of technical reports and ETDs (Kennison et al. 2013).

ETDs are key factors in making the open access movement a reality. Most of the content in Algerian digital repositories is grey literature and ETDs represent 55% of all the content in Algerian digital repositories. Consequently, there is a definite need to establish metrics that measure their use. This has generated increased international interest from the academic community since 1987, when work was first begun to resolve the many obstacles, ranging from ease of access to the need for long-term preservation, while the reasons were mainly to resolve the many issues related to printed theses. For instance, Aquil et al. (2014) mentioned that the digital libraries of ETDs promise to be extremely useful to scholars, especially in developing countries. The greatest advantages of ETDs lie in avoiding duplication in research work, ensuring fast access to information, promoting resource sharing and providing a permanent solution to the problem of space.

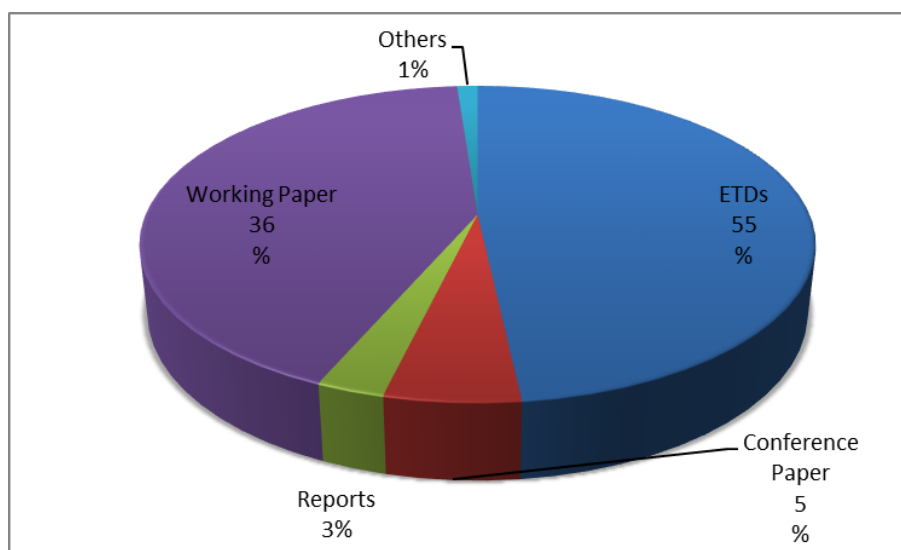


Figure 2: ETDs compared to the total content of Algerian digital repositories.<sup>2</sup>

## Metrics to Enhance the Value of ETDs in Digital Repositories

The tracking of IR activity is of great importance in evaluating the sustainability of IRs, enhancing their ability to assess and predict the changing needs of users to then help repository managers evaluate their content and make decisions. Download statistics and other expressions of information use, like page visits, are regarded as additional metrics for information impact (Tsakonas and Paratheodorou 2009). As highlighted in Figure 2, 55% of the content in Algerian digital repositories is ETDs, and 50% of the repositories use metrics

<sup>2</sup> Author is the creator of the picture.

from third parties such as Google Analytics. As a new publishing system, repositories include many different tools to increase the value of the content. Once a faculty member has one article in a repository and begins to receive monthly statistics on downloads and use, they have greater motivation to ask libraries to include the rest of their materials (Giesecke 2011). Due to the importance of metrics in assessing the usage of online materials and the failure of traditional tools to resolve the multiplying issues and to keep abreast with new technologies in this arena, the advancement in technology which heralded ETDs brought leverage to efforts to address the problems of printed TDs.

Awareness of ETDs was increased with the introduction of the Database of African Theses and Dissertations (DATAD) by the Association of African Universities (AAU). Anunobi and Onyebinama (2011) posit that several projects are being developed in the European library community to set standards and develop tools for IR statistics reporting. These include PIRUS2, which has been funded as the IRUS-UK service (O'Brien et al. 2017). With the increasing importance of the social web, outreach has become more possible for electronic theses and dissertations with new metrics to spread ETDs in the social web environment. In this regard, Palmer (2013) argued that the benefits of introducing altmetrics into a repository include the possibility to deliver impact measures for publications that have not been published in scientific journals, such as posters, dissertations, datasets, and books. Moreover, altmetrics and PlumX can add more significant metrics for repositories, contribute towards disseminating EDTs, and measure impact and references on the social web. Konkiel et al. (2015) claimed that Altmetric collects altmetrics for any content in an institutional repository or digital special collection, including institutional repository items that have multiple versions stored elsewhere (i.e. the publisher's "version of record" of a journal article stored on the publisher's site, plus the author's preprint stored in the repository). The reports it generates include both metrics for the preprint in the repository as well as metrics related to the publisher's version on the journal's website. This might be a good option for IRs that do not issue permanent identifiers like Handles or DOIs that could monitor social media sites for mentions of relevant URLs instead.

Table 1: Metrics in the Algerian digital repositories<sup>3</sup>

Metrics in repositories	Percentage
Item downloads	50%
Location of visitors	58.33%
Number of items in repository	75%
Recent submissions	83.33%
Item uploads	25%
Total visits	58.33%
Total visits per month	58.33%
Top country views	58.33%
Participating units	75%
Participating faculty	66.66%
Scopus H-index for journals	10%
Impact factor	10%

<sup>3</sup> Author is the creator of the table.

As can be seen from Table 1, the recent submissions metric ranked first, followed by number of items in repository with 83.33% and 75% respectively. Then came participating faculty and participating units with 75% and 66%, which are considered in-house metrics. The metrics related to Google Analytics are represented through location of visitors, total visits, total visits per month and top country views, all with 58.33%, then item downloads with 50%. This can be counted at individual and community level as well. In addition, most repositories count the number of ETDs in a specific community, and the ones included in each community. Regarding metrics related to the growth of the repository, represented through item uploads, 25% of the repositories provide item uploads in a specific period of time, which has an impact on determining the growth of the repositories. The Scopus H-index for journals and impact factor metrics have been found to be less commonly available in the Algerian repositories with 10% for each, although those metrics are specifically for journals rather than ETDs. According to (OpenDOAR, 2019), 73% of the repositories use DSpace software, which also offers statistics at the individual record and collection level, and just 7% use Eprints, whereas 20% use others, like WordPress and self-built CMS. Presumably, the use of non-standard software for repositories makes it difficult to set up reports and strong statistical services that fully meet the need to measure the usage of the repositories with statistical projects either with commercial services or academic ones and free from third parties such as Google Analytics services, which has been adopted by 46% of the repositories.

## **Discussion and Conclusion**

The importance of repository metrics as value-added tools has been increasingly decisive in the online environment for determining and evaluating the success of repositories and content. Repository managers should be aware of the importance of metrics and their contribution in adding impact and value to their content. The results of the present study indicate that half the Algerian repositories have metrics related to usage statistics from item downloads, total monthly visits and top city views, counted at individual, collection or community levels, the same for location of visitors using metrics like item downloads, which has not been enabled by some repository managers, although these are actually integrated in their repositories, especially those using DSpace and EPrints.

Most other software packages are old versions, and this is a problem in view of the new trends in the complementary process of the repository, from collection to evaluation of the content, increasing the value of EDTs and broadening access to wider audiences worldwide, giving ETDs the maximum possible exposure. The need to establish a culture of metrics has been increasingly clear as the age of data has penetrated all fields. The lack of this culture prevents ETD and grey literature publications from being discovered and used. Online usage data has become vital as different metrics serve different purposes for different stakeholders in the digital repositories projects. Every stakeholder has its own significant metrics which demonstrate the value of its contribution to the repository in numbers. This is because metrics give vitality to the electronic theses and dissertations, and enable authors to see the impact of their theses. This consequently gives them motivation to place their work in repositories, and establish connections through the impact of their work. This process is beneficial for many parties in relation to IR projects.



## **Recommendations and Suggestions**

The Algerian digital repositories lack a strong culture of metrics, since half the metrics relating to the measurement of use are less available compared to other metrics, at 50% and 58.33% respectively, while metrics of usage should be top priorities for repository managers. This might be a potential barrier to obtaining funding for enhancing the value of ETDs (the quantities of which are growing rapidly due to the mandatory depositing of digital copies in libraries) in particular, and grey literature in general.

Data standardization is becoming of significant importance for repositories when measuring the impact of research. Schufreider and Romaine (2008) demonstrated that most respondents felt the greatest challenges relating to usage statistics were the amount of time involved and a lack of consistency/absence of standards. Needham and Lambert (2019 a) emphasized that there is no single, perfect measure to assess value and impact, and institutions may use a range of metrics including citations, page views and altmetrics. However, download statistics are among several measures used to demonstrate value and are the focus of this article. Usage metrics are a key aspect in terms of understanding how publicly available research is being used. Tracking, monitoring and benchmarking the usage of scholarly resources supports an understanding of an institution's research. Over the past 15 years, the COUNTER standard has been integral to facilitating the recording and reporting of online usage statistics in a consistent, credible and comparable way, as current research is prompting an increasing interest in more granular metrics, including item-level and research data metrics. The COUNTER standard, now in its fifth iteration, has evolved over time in response to a changing environment and evolving requirements. COUNTER CoP release 5 (R5) standardizes usage metrics for e-resources, including journals, books, databases and platforms due to the increasing interest in more granular metrics, including the item level and research data metrics. (Needham and Lambert 2019b). Most importantly, the need for repositories to collaborate using standardised metrics today is the subject of great international interest, and many projects and initiatives like COUNTER have been released over the past decade, such as SUSH (Standardized Usage Harvesting Initiative) and the OpenAIRE Usage Statistics Service to meet the needs of use granularity and standardization usage metrics for e-resources.

Electronic theses and dissertations can add more value to the research and the institution. We have observed significant variations between repositories regarding the metrics they offer, generated using various platforms which in turn use different metrics to represent different meanings on impact, and the ability to use the Google Analytics service for this purpose without any cost. Based on the outcomes of the research, two suggestions have been made:

### **Use Metrics to Argue for Funding**

Many repository networks like IRUS-UK (Institutional Repository Usage Statistics UK) have appeared to measure the use of online content. Funders, whether people or organisations, need to know that the money they invest has a positive impact on the project they have invested in and the outcomes the project intends to produce. A strong, targeted metrics infrastructure is needed to serve as a driver to increase the impact of the content, and to assess the sustainability of a project, its use, growth and success, and to measure the advantages for all the members of the academic community. Such services, like Plumx, need effort and financial support, which can only be received by advancing and spreading a real culture of

metrics and establishing meaningful metrics to measure the impact of the content and to evaluate its use and reuse for members of the academic community members and others.

### **Altmetrics as a Value-Added Service**

The further development of metrics technology in alignment with the social web is needed to expand access and referrals to ETDs in the social web; social media platforms are powerful altmetrics tools to ensure the outreach and measure the impact of ETDs and grey literature in general in a new context and in a much more complex environment. Altmetrics might be useful for repositories to measure the visibility of their content on social media, bookmarking platforms complementing download/citation metrics and ETDs, as these represent more than half the content that will be exposed to wider and global audiences.

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