Characteristics and use of grey literature in scientific journals articles of Algerian researchers:

Case study of University of Science and Technology Houari Boumediene (*Physics, Chemistry and computer sciences*)

Lydia CHALABI

DRDSI, CERIST research center, Algiers, Algeria; Information Science Department, University of Algeirs2, Algeria

lchalabi@mail.cerist.dz, net_lydia@yahoo.fr

Abstract. This paper examines grey literature in research articles of Algerian teachers-researchers across the STM(Physics, Chemistry & Computer science) sciences at Algerian University of Science and Technology "USTHB". Each of these disciplines is respectively high ranked according to the report of Algerian general directorate of scientific research and technological development about Top emerged disciplines in Algeria. The purpose of the study is to reports the important and use of electronic resources particularly grey literature resources in their scientific journal papers and to identify the characteristics of these kinds of resources. The methodology is based on quantitative and qualitative components. The quantitative part of our sample consists of five articles per year for each discipline: physic, chemistry, computer science. 1028 references were examined; derived from 60 Algerian teachers- researchers articles journals published in international scientific journals and reflected in Scopus. The study attempts to provide insights into the characteristics of grey literature in a range of disciplines.

Introduction

The advent of the World Wide Web and the Internet in particular has a huge impact on the publishing of science where new forms of circulation and access to knowledge have emerged namely open access, as well as , a strong need to assess the effectiveness of scientific research has emerged. The latter must be consistent with current communication modes knowledge and the changing of users needs.

In reality, issues of significant amounts allocated to electronic resources integrated into the academic sphere and for which a return on investment analysis and is indispensable, have allowed the development of studies uses in order to guide the offer and services to offer [1].

However, when studies of electronic resources uses and open access platforms proliferate, it should be noted, that few studies, in this regard, on the ground in developing countries in general and Algeria in particular.

In fact, the Algerian scientific research makers are aware that the evaluation of scientific research is an absolute necessity [2], where a favorable policies with infrastructure and digital services to promote a national policy research and development was created. We also notice several incentive

and financing scientific research programs and investment in some large commercial scientific publishers (Boukacem, 2010).

Therefore, among of documents used by researchers which belong to the so-called grey literature consisted of a set of scientists variable contents where the most are academic. This type of literature is not easily accessible, especially for developing countries that many studies and researches are made on issues of vital importance to the growth and development, but which are not widely distributed and difficult to find [3].

In this regard, our study focuses on the analysis of teachers-researchers patterns in physics, chemistry and computer science, at University of Science and Technology Houari Boumediene « USTHB » - first Algerian university in terms of publications (Thomson Reuters in January 2012) - in terms of information retrieval, characteristics and place of the grey literature in the research activity and communication results, in the era of electronic resources pay and open access.

What are the Algerian researchers habits regarding information retrieval?

How important and characteristics is grey literature publications in scientific research?

Interest and objective of study

This study is the first of its meaning, it can be seen as a contribution to stimulate interest in an issue that we consider important to the Algerian researchers, it also concerns the assessments of research institutions to decide how to orient and improve their acquisitions, information policy, and information dissemination. It also contributes to study the impact of open access on publication of Algerian researchers.

Hypothesis

To achieve these objectives, we made two assumptions that will form the basis for the collection of information:

- Grey literature is used in the research of Algerian researchers, particularly in scientific articles.

- The Algerian researchers use, much more, the open access grey literature retrieved on the web.

Methodology

Our study sample is Algerian University of Science and Technology Houari Boumediene "USTHB" first active university in terms of publications according to the report of Algerian leadership of research and development about 10 Top Algerian universities [4]. Therefore the discipline choice is focused on the physics, chemistry and computer science, ranked among the top 10 emerged discipline in Algeria [5].

Our methodology consists of two parts: quantitative and qualitative.

Quantitative part

Our sample is consisted of five articles per year for 2009 to 2012.

These journals articles are referenced in one of the biggest databases of citations and referencing known worldwide « Scopus » [6].

The selection of items is based on the following points:

- Period: 2009-2012
- Most cited journals articles
- First author affiliated to USTHB

1028 references were examined and derived from 60 Algerian teachers- researchers articles journals published in international scientific journals and referenced in Scopus for 2009 to 2012.

Quantitative part

After the quantitative part, it was necessary to find "on the ground" qualitative confirmation of diversity and convergence of practices observed among the researchers interviewed.

 In this section it was discussed to achieve semi-structured interviews with a sample of 12 teachers, researchers, men and women, PhD, lecturers and teachers at Physic, chemistry and computer science faculties of Algerian University of Science and Technology Houari Boumediene "USTHB"

The interview grid was based on the following:

- research and teaching disciplines

- time devoted to research and teaching

- habits and practices regarding information retrieval

- use and characteristics of grey literature

The interviews lasted between 40 minutes and 1 hour 30 minutes on October 2012 to November 2012 in offices of faculty, which has allowed reading the material environment and organizational documentation and resources used.

During these meetings, teachers-researchers explained their habits and practices related the information research: site consulted characteristics and the materials used...etc.[... they show reasoning, arbitrations, strategies and objectives that underlay](Boukacem, 2010).

This part has also been able to shed light on the context in which teachers-researchers work at university and understand if it affect or not the integration of resources in their research.

However the biggest obstacle that we faced was to meet teachers to achieve the interviews. Obtaining the contact details of researchers has been very difficult. The latter are not always visible on directory of researchers and if they exist, not always up dated for both appointments.

Results and discussion

The goal of our study is to define the use and understanding of the researchers habits looking for information, how electronic resources are received, how important grey literature is in their scientific publications.

1. Patterns in information research

The majority of interviewed teachers-researchers admit having used the web to find the scientific literature from their homes or internet cafes in particular. This is due of connection problems at the university and if it exists, it does not permit necessarily a good information retrieval and the download of full text because of its slow speed. The interviews confirmed that the almost exclusive use of Google as a search engine and allowed to understand that consultation electronic resources platforms is limited and insufficient. Contingency access provided by institutions (difficulty, slow connections) is cited as an obstacle to the use of electronic documentation. Also for the Algerian online national system of documentation"SNDL"[7], the interviewers report that over its shortcomings in terms of supply and services, adding connection problems that drive most of the time to give up.

Another aspect has to be emerged from this analysis, that teachers-researchers manage their information research, by using Google for the supervision of doctoral thesis, through contacts with colleagues or an internship. We noticed a random and inefficient information search which indicates a web training needs as well as platforms of electronic resources.

2. Place and characteristics of gray literature

According to the quantitative information as shown below the use of grey literature differs from discipline to another. The higher level citation of this kind of literature comes from computer science and the last one form chemistry. (tab.1)

This difference is due to the characteristics of information research for each discipline. The Interviews related with what we said earlier, in some discipline, researchers prefer simple research, which guarantee wider answers, even if they are not well organized.
In other discipline, as chemistry, the interviews allowed us to understand that the majority of teachers-researchers prefer to include items most cited and not difficult to identify.

The teachers-researchers have a limited time to read, they have a teaching activity parallel to them research, they have administrative and educational responsibilities and it have yet to publish regularly in places recognized by the community.

The information we have gathered during the interviews shows clearly that this practice is more prevalent among the more experienced users, with scientific and administrative responsibilities, and combining the roles of "reader-author-reviewer".

Therefore the characteristics of grey literature used, is consisted to five documents type: thesis, conference, working paper, reports and data collection, where the conference take the majority of uses. (tab.2)

For the accessibility and grey literature full text retrieval, qualitative and quantitative results revealed that most of full text can be found on the web freely. (tab.3)

Table 1. Volume of grey literature references

Year	Physic			Chemistry			Computer science		
	N° of all references	N°of grey literature references	Percentage	N° of all references	N°of grey literature references	Percentage	N° of all references	N°of grey literature references	Percentage
2009	94(100%)	9	9,57 %	62(100%)	1	1,62 %	57(100%)	24	42,06 %
2010	90(100%)	6	6,66 %	68(100%)	4	5,88 %	120(100%)	45	37,5 %
2011	79(100%)	4	5,06 %	99(100%)	1	1,01 %	102(100%)	23	22,54 %
2012	75(100%)	8	10,66 %	68(100%)	0	0 %	114(100%)	50	43,85 %

Table 2. Characteristics of grey literature

Discipline	Year	N° of GL references	N° of conference	N° of thesis	N° of rapports	N°of working papers	N° of data collection
Physic	2009	9(100%)	88,88%	11,11%	0 %	0 %	0 %
	2010	6(100%)	66,66 %	16,66 %	0 %	16,66 %	0 %
	2011	4(100%)	75 %	0 %	25 %	0 %	0 %
	2012	8(100%)	87,5 %	0 %	12,5 %	0 %	0 %
Chemistry	2009	1(100%)	1 %	0 %	0 %	0 %	0 %
	2010	4(100%)	50 %	0 %	25 %	0 %	25 %
	2011	1(100%)	100 %	0 %	0 %	0 %	0 %
	2012	0(100%)	0 %	0 %	0 %	0 %	0 %
Computer science	2009	24(100%)	79,16 %	20,83 %	0 %	0 %	0 %
	2010	45(100%)	77,77 %	11,11 %	6,66 %	4,44 %	0 %
	2011	23(100%)	95,65 %	0 %	4,34 %	0 %	0 %
	2012	50(100%)	82 %	14 %	2 %	2 %	0 %

Table 3. Accessibility of documents

Discipline	Year	N° of GL references	Accessibility by a pay platform	Open access	unpublished
Physic	2009	9(100%)	3(33,33%)	3(33,33%)	3(33,33%)
	2010	6(100%)	1(12,5 %)	1(12,5 %)	4(66,66%)
	2011	4(100%)	1(25%)	3(75 %)	0 %
	2012	8(100%)	4(50 %)	4(50 %)	0 %
Chemistry	2009	1(100%)	0 %	0 %	1 %
	2010	4(100%)	0 %	3(75 %)	1(25%)
	2011	1(100%)	0 %	0 %	1(100 %)
	2012	0(100%)	0 %	0 %	0 %
	2009	24(100%)	9(37,5 %)	10(41,66 %)	6(25 %)
	2010	45(100%)	10(22,22%)	20(44,44%)	15(33,33%)
	2011	23(100%)	5(21,74 %)	15(65,21 %)	3(13,04 %)
	2012	50(100%)	13(26 %)	30(60 %)	7(14 %)

Finding

This is an exploratory study that can be considered difficult in this type of work.Even the limits; this study reveals characteristics of Algerian teachers-researchers practices regarding the information research. The reality is that:

Even quantitative data reveals the use of electronic resources, difficulties that the teachers-researches could face, show a marked lack of uniformity due to the environment in which they work and consult electronic resources. Like autonomy and isolation that leads to develop unraveling practices that is not homogeneous and inactive. Despite the offer content which it's not enough.

As was clearly indicated by Schöpfel (2010) and Chalabi (2012), the grey literature has found a means of communication on the web especially in institutional open repository, but its uses differ from discipline to another.

More grey literature studies covering other developing African nations are necessary.

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Appendix

Links offering free full text

http://www.pnas.org

http://scripts.iucr.org/

http://rspa.royalsocietypublishing.org

http://arxiv.org

http://scitation.aip.org

http://royalsocietypublishing.org

http://www.aipuniphy.org

http://scitation.aip.org

http://eresearch.qmu.ac.uk/806/

http://www.assta.org

http://www.afcp-parole.org/doc/Archives_JEP

http://www.svms.org/learnability

https://online.tugraz.at

http://wam.inrialpes.fr

http://reference.kfupm.edu.sa

http://www.cnbc.cmu.edu

http://www-clips.imag.fr

http://www.speech.kth.se

http://www.aipuniphy.org/Portal/Portal.aspx

http://www.clean-auto.com/spip.phparticle1334

http://www.soe.uoguelph.ca

http://www.irisa.fr/

http://www.dtic.mil

http://www.asel.udel.edu

http://www.speech.kth.se

http://acustica.ing.unibo.it/

http://ijrte.academypublisher.com

http://research.microsoft

http://eresearch.qmu.ac.uk/806/