Enhancing the visibility and impact of scholarly research: an exploratory study on knowledge production settings

Isabel Pinho [*]

Sara Diogo [**]

Abstract

Research work and knowledge production have a lack of visibility and impact strategies. At the individual level, researchers must share their results and disseminate outputs, such as publications, patents, etc. In addition, research work is a collaborative space based on formal and informal procedures. The literature on the field argues that there is the need to improve the visibility of research in order to enhance its impact, at both the academic and the societal level. This article is based on recent studies about impact-oriented monitoring and assessment. In order to identify researchers' tools and strategies to address this situation, an exploratory study in two university research centers in Portugal was developed. Preliminary results show a need for implementing strategies at both organizational and individual levels that define the relevance of knowledge production for the research center, while simultaneously promoting visibility and impact of this production.

Keywords: Scholarly communication. Research visibility. Knowledge production. Research impact. Scientific communication. Higher education.

[*] PhD in Management from University of Aveiro, Portugal and Post-doctorate in Higher Education from Federal University of Rio Grande do Sul, Brazil. Member of GOVCOPP – Governance, Competitiveness and Public Policies, Portugal. Member of Inovaval, Brazil. E-mail: isabelpinho@ua.pt.

[**] Policies Post-Doc Researcher at GOVCOPP – Governance, Competitiveness and Public Policies Unit, University of Aveiro (Portugal). Invited assistant Professor at the University of Aveiro (Portugal) and Researcher at CIPES – Research Centre on Higher Education. E-mail: sara.diogo@ua.pt.

1. Introduction

In the often called "knowledge society", "information society", the "expert society" (BRANTE; FULLER; LYNCH, 1993, p. 177), researchers play a paramount role in sharing and disseminating their research. Nevertheless, to publish scientific articles and sharing research results does not suffice to researchers and academics contribution (and commitment) to their profession. There is a gap in the implementation of visibility strategies, both at the individual level and at the organizational level, here understood in the context of university research centers.

In order to identify the main dissemination tools and impact strategies in this domain, an exploratory study was developed. To start this research, an online questionnaire to researchers of one Portuguese university was applied, providing some insights about strategies to be implemented to increase the impact of researchers' production, institutional visibility and attractiveness.

The purpose of this study is to understand if the researchers have a strategic thinking and action (behaviour) on knowledge production visibility and impact.

Two questions guided the study:

- What are the main strategies that researchers use to increase visibility and impact of their publications?
- What are the tools that researchers use when they perform research activities during knowledge acquisition, knowledge creation, knowledge sharing and knowledge transfer processes?

Ultimately, or consequently, we also aim at understanding researchers' behaviour and relationship towards their scientific production and the institution(s) they work for.

Based on the literature background and on the results of this exploratory study, it is possible to confirm that the topics of research visibility and research impact – as well as the processes of knowledge production – are relevant for the study participants and for the academic community in general. However, there is still a lack of literature that approaches these issues in an integrated manner (EGGHE; GUNS; ROUSSEAU, 2013). In addition, we found that practical conclusions can be applied from the data gathered, namely organisational strategies for the research centres, as well individual procedures that researchers can apply. Also, Christine Musselin (2013) reinforces the idea that when

doing peer review, institutional managers can have a positive impact by empowering "individuals who set the norms according to which academic activities are rewarded and funded by public actors" (2013, p. 1165). In fact, even if the role of managers in the knowledge production scenario may seem somehow invisible, considering that those who produce knowledge are the researchers, it is, however, institutional managers' duty to provide conditions to manage the processes of knowledge production and knowledge diffusion. The idea that research outputs can sometimes look like "fortunate happenstance (a characteristic usually referred as **serendipity**) is being changed to give room to the fact that knowledge emerges from a series of more or less organised processes that, at some point, need to be professionally managed.

The importance that both researchers and institutions feel in creating impact is justified (and even legitimized) by the pressure of research agendas which are now driven not only by the requirements of pursuing scientific excellence, but also by the expectations of multiple (and demanding) stakeholders (GIBBONS et al., 1994; DERRICK; SAMUEL, 2016). Impact relates to research in the sense that enables to produce knowledge which will contribute to solving big societal challenges and to the achievement or implementation of the sustainable development agenda goals (SEYFANG; SMITH, 2007; UNITED NATIONS, 2015).

2. Theoretical Background

The knowledge produced by research is considered to be a public good and should be available ubiquitously (HESS; OSTROM, 2007, p. 14). The intrinsic quality of the research is not sufficient for its use, both at the scientific and at the societal levels. Knowledge management can help to bridge the gap between knowledge production and its dissemination and impact. We start from the assumption that knowledge is a resource that should be managed as such in order to facilitate not only its production but also its use in a wise manner. The intangible nature of knowledge makes it a challenging resource to be managed and valued. We know that it is easier to explicit or to attribute value to tangible resources because, obviously, they can be quantified. Nevertheless, differently from other tangible (and natural) resources, the production, development and use of knowledge do not restring it – quite the opposite: as more as it is produced and used, the more it grows, generating both internal and external spillovers (CARLINO, 2001). An

efficient management of knowledge facilitates both its production and use. By knowledge management we refer to "the conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance" (O' DELL; GRAYSON, 1998, p. 6). Academic institutions are organizations that have an intensive use of knowledge (TIAN, NAKAMORI; WIERZBICKI, 2009; SANTIAGO; CARVALHO, 2011; CARVALHO; SANTIAGO, 2015; SANTIAGO; CARVALHO; FERREIRA, 2015; CARVALHO; SANTIAGO, 2016a; 2016b). In this context, we can think of managing knowledge by creating advantages to both individuals and institutions. Although the university research centres assume their mission as knowledge creation privileged spaces, the management of knowledge within these organisations seems to be, still, at an embryonic stage (SOUSA; HENDRIKS, 2008) despite their significant increase of autonomy (CARVALHO; DIOGO, 2018).

The linear or input-output model does not reflect reality because between both concepts – input and output – there are activities and processes which mediate these stages. If we want to understand how inputs are transformed into outputs, it is crucial to realize what is in the middle: the knowledge processes. Bearing this knowledge management approach in mind, four main research knowledge processes are considered to be efficient (authors).

1) Knowledge acquisition, which refers to the searching, identifying, selecting, collecting, organizing, and mapping information/knowledge;

2) Knowledge creation is seen as ''the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting it to an organization's knowledge system'' (NONAKA; VON KROGH; VOELPEL, 2006, p. 1179);

3) Knowledge transfer applies to the process that deals with transmitting explicit knowledge from one source/agent (individual, team/department, and/or organisation) to another (JOSHI; SARKER; SARKER, 2007), and

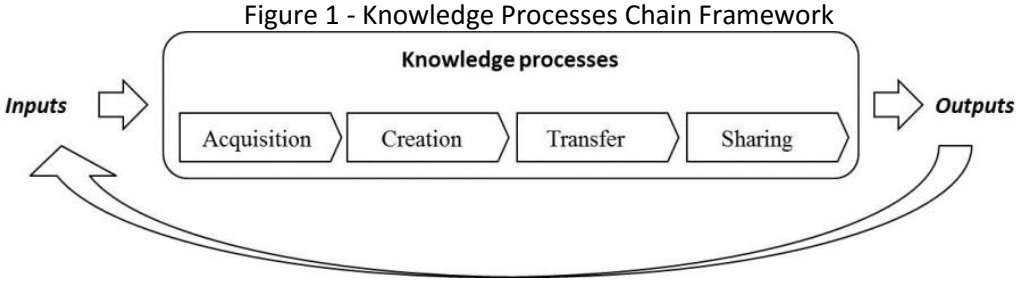
4) Knowledge sharing is the process of exchanging tacit knowledge through social and collaborative processes (NONAKA; TOYAMA; KONNO, 2000).

It is important to note that we distinguish knowledge transfer from knowledge sharing based on the distinction between tacit and explicit knowledge (POLANYI, 1967). Thus, the transfer of knowledge appears associated with explicit knowledge, documented and connected with what is generically termed as information. In turn, knowledge sharing

is associated with tacit knowledge, which is embedded in people and communicated through social interactions (COLLINS, 1974). The knowledge sharing process happens in social spaces where tacit knowledge can be captured through a learning exchange. Part of this tacit knowledge can be articulated and codified and then packaged; this is the explicit knowledge that can be transferred. In this way, knowledge transfer happens at the level of explicit and codified knowledge (information), in the form of documents or patents, while knowledge sharing involves human interaction, a learning experience at the tacit level of know-how and even learning by doing (NONAKA; TOYAMA; KONNO, 2000). Knowledge Sharing is more about tacit knowledge that need a shared language that promote knowledge co-creation. The exponential growth and social/professional networks and the use of social media tools are facilitators to knowledge flows and to social interaction, but human interaction is the richest way of sharing knowledge (TURNER; PETRUNIN, 2015).

Those four knowledge processes are interdependent; each of them and all of them together produce outputs. In this study, we want to identify what tools can be used to improve the visibility of the outputs in order to improve their use and impact (Figure 1).

Figure 1 - Knowledge Processes Chain Framework



Source: The authors, (2018).

We defend that the more visible research outputs are, the more it benefits researchers, directly and indirectly. This also corroborates the vision of Leo Egghe and his colleagues about the interdependence of the visibility of articles and his co-authors (EGGHE; GUNS; ROUSSEAU, 2013). Research knowledge management must define and implement visibility and impact strategies that allow for learning and understanding about research communities and outreach activities in order to engage various knowledge user groups (VAN NOORDEN, 2014). Knowledge management also facilitates research work coordination and collaborative knowledge construction (MAYORDOMO; ONRUBIA, 2015).

Traditionally, and still nowadays, the act of writing academic scientific articles for publication continues to be a vital activity for academics (MCGRAIL; RICKARD; JONES, 2006). The process of writing scientific articles must take into account an important task: to choose the most appropriate journal (ENGELS; OSSENBLOK; SPRUYT, 2012). In fact, writing a scientific article **per se** is not **enough**... The journal with the most appropriate or suitable scope can be the key to reach the proper target audience, and consequently, to have a positive impact on the visibility and dissemination of research (DOYLE; CUTHILL, 2015). A very meaningful scientific paper can lose part of its visibility and impact if it does not reach the journal with the **right** scope and audience. Another criteria to choose the journal is related to journal impact factor; because of researchers should be aware of the controversy and debate on the impact factor and its use in research evaluations (VAN RAAN, 2012; WALTMAN; TRAAG, 2017).

One global problem of the publishing process is related with the ambiguity of the researcher name. There are two types of "name ambiguity that emerge in real data: a single object, e.g. individual, is referred to the use of different names (synonym problem); two objects, i.e. individuals are referred to the use of the same name (homonym problem)" (GOMIDE; KLING; FIGUEIREDO, 2017, p. 750). Through the use of a unique and unequivocal identifier for each researcher these problems can be overcome, facilitating the collection of data of the researchers' bibliographical production. The Orcid ID provides a persistent digital identifier that facilitates a clear authorship recognition and integration of all dispersed publications.

Another publishing decision is related to the language used: to publish in English or in non-English language have implications on the visibility of articles and also in the research evaluation and career development (TARDY, 2004; DELAMONT, 2011; VAN WEIJEN, 2012; MARTYNA; JOHANSSON, 2015).

Research evaluation and assessment are structural elements of contemporary academic context. Traditionally, (blind) peer-review is the method of evaluating and assessing research through which colleagues mutually evaluate research outputs (BORNMANN, 2011). Additionally, the process of assessing science, researchers, in general and research, as well as higher learning institutions, uses a variety of bibliometric indicators (GODIN, 2007; AURANEN; NIEMINEN, 2010). Whether, at a first stage, the (high) number of publications was the indicator that weighed more, and especially after the advent of online platforms, as time

went by, the number of citations of each publication becomes an important indicator. New indicators related to the sharing and transfer of publications have gained more credibility in the academia, evaluation processes and society (MELERO, 2015).

3. Methodology

In order to identify strategies and tools that researchers employ to improve visibility and impact in their knowledge production, a self-administered questionnaire was designed with a total of 27 questions, spread by three main groups, as it will be explained later in this section. Our sample, constituted through a convenience sample, comprised researchers from a Portuguese public university, located in the littoral centre of the country. This institution is considered a young university, as it is less than 50 years old. It is a multidisciplinary university that quickly became one of the most dynamic and innovative universities in Portugal. It has about 15,000 students attending undergraduate and postgraduate programmes, including 32 post-doctoral students and 1316 PhD students. In terms of academic staff, 1199 professors and 420 researchers work at this university. The population of our sample is distributed around the following occupations and percentages: Professors (51%); PhD students (32%) and researchers (17%). The "researcher" occupation is still challenging to define in Portugal, as only recently, with the approval of the DL 57/2016 of 29th of August, has this category became regularised. For this questionnaire, and because the data was collected in 2016, but before the approval of this law, we considered a "researcher" someone who dedicates his/her time almost exclusively to research (no teaching activities or almost none), at the PhD level or upper levels, and who has a contract with the university where the questionnaire was distributed (e.g. a PhD or Post-Doc Marie Curie scholarship holder). Most of these participants belong to the field of Social Sciences and Humanities (89%). The preponderance in these two scientific fields can be explained due to the fact that the questionnaire was distributed in two research centres belonging to these scientific fields.

The purpose of this survey is to identify strategies on the visibility of scientific production by allowing scholars to reflect on their own publications and research dissemination practices. The three main parts of the questionnaire are related to the

researchers' profile, to the researchers' strategies – (active) behaviour on visibility and to the tools used on knowledge processes.

In the first part – researchers' profile – we gathered personal data of the participants, namely such indicators as disciplinary affiliation, experience in publishing and the research role (e.g. PhD student; Post-doc students; etc.). The second part focuses on visibility strategies such as **Open Access** publications, international co-authorship and the use of standardized affiliations. The third and last section – knowledge processes – is composed of questions about tools and/or websites and platforms used to facilitate research activities. An accurate list of some tools, online platforms and websites can be checked on Annex 1. These tools are presented according to some of the research activities: a) references' management; b) relevant literature searching; c) accessing full documents; d) data analysis; e) archiving and sharing documents; f) decide which journal to submit; g) measure scientific production; h) sharing online CV. Although the exploratory data analysis here presented relies mostly on statistical frequency analysis, it already provided a solid starting point for a further deeper and more developed study (CRESWELL, 2009).

4. Results

4.1 Sample Profile

Before moving to the findings obtained through the questionnaire answers, it should be referred that we considered academic age as the number of years that mediate respondents' first scholarly publication (we did not include students' thesis or dissertations), until the moment they answered to the questionnaire. By other words, instead of considering the age of the participant, we chose to focus on their experience in publishing. Therefore, the question used to segment and define the categories of the academic age of respondents was "In which year did you publish your first scientific publication?"

The academic age of respondents (First scholarly publication) was quite evenly distributed across our four categories: novice, junior, experienced and senior. Thus, when we refer to academic age, we mean the year that each respondent published his/her first article. In this way, if the first article was published in the last five years, i.e., from the

period between 2011 and 2016, we classified this respondent as a novice, meaning this someone who is starting his/her academic career. Following this line of thought, those who have published their first articles between 2006 and 2010 were classified as **juniors**; those who have published their first article between 2001 and 2005 are the **experienced ones**; and the **seniors** are those who have published their first article before 2001. Based on this classification, 17% of our sample are novices, 26% are juniors, 21% are considered experienced researchers and the largest group is composed by the seniors, with 29% of respondents. It should be noticed that 7% of the respondents have not published yet. Those data evidence a somehow **natural phenomenon**: in academia life, it is somehow expected to find different concerns and strategies from the **novices** respondents when compared to the **senior's** segment, considering that they are starting their career. As such, not only are they less experienced than the **seniors**, but also they are more expectant about their careers. Changes in the academic profession, knowledge production, institutional and individual assessment performance also explain differences in academia behaviour as mentioned before.

At the organisational level, research centres should look to the novices and give them training to improve their own curricula, as well as, and consequently, to improve the image of the research centre. Additionally, the research centres can learn from each other's best practices in order to learn and share the best strategies. In fact, research centres should work as epistemic communities (HAAS, 1992).

4.2 Strategies

The second part of the questionnaire was devoted to identify the strategies that researchers use most to increase the visibility and impact of their work. In order to contextualise the respondents on what we consider to be a "research strategy", the first question of this group introduces some websites available for researchers (and another type of academic workers) to build and to access to their CV online.

The key platforms that respondents use to prepare their CV online are: FCT-SIG (32%); Orcid (24%); FCT-DeGois (20%) and Europass (12%). Following this, we asked whether our sample had already published a literature review article. We followed Onodera and Yoshikane (2015) argument who refer that this type of articles – literature review articles usually have a higher probability to be read and cited. On this, 51% of respondents

reported that they have published a literature review article. This goes much in line with what other authors have referred about the importance of literature review publications, as they elucidate on theoretical grounds, help to structure the readers' thoughts and their points to ideas or issues for future research (MARTÍNEZ; ANDERSON, 2015).

Within this section, we also asked if respondents consider that **Open Access** publications have a positive impact in the number of citations articles have. Most of them consider that **Open Access** publications, effectively, have a positive impact on the (increased) number of citations (90%). 65% of respondents think that publishing with international co-authorship increases the number of citations of their work (WANG et al., 2015). These findings go in line with the results of Mirnezami and colleagues (2016), who reported that scientists who publish with a larger team of authors generally receive more citations. "Hence the greater visibility provided by a more prolific scientific production, better journals, and more co-authors, all contribute to increasing the perceived impact of articles" (MIRNEZAMI; BEAUDRY; LARIVIÈRE, 2016, p. 262).

McKiernan et al. (2016) analyse the correlation between open access and incoming citations, the scientific impact and the development of researchers'/authors' career, challenging the general assumption that publishing in open access may not be positive for researchers, when, in fact this has been proved to be quite the opposite situation (MCKIERNAN et al., 2016).

The findings of this questionnaire position research production as an outcome of a collaborative social activity (BOARDMAN; CORLEY, 2008). The vast majority of respondents (90%) agree that after publishing an article, they need to make it visible. On this, we included an open question to capture respondents' strategies used to enhance the visibility of their publications. The most common procedure that respondents pointed out is the need of using a unique name (96%), but 22% of them use their Orcid identifier. Related to the institutional level, 88% of the respondents are aware that they should use the standardized affiliation of their institution and they also indicated that they choose relevant keywords to facilitate the search made by other researchers (90%). These data show us that, even if not through formal and strict ways, there is a real concern that respondents have in disseminating their knowledge production. Other visibility strategies applied by respondents relate with the speed and capability of dissemination as well as with the easiness of the access that their work is made available. By other words,

respondents feel that by uploading their work in various online platforms (e.g. ResearchGate; academia.edu), and by publishing it in open access databases, it will help them to increase their potential audience (MAQABLEH et al., 2015). In addition, they also attribute considerable importance to archive their work at the institutional repository, or even in new current channels, such as social and professional networks. Notice in Annex 1 some of the tools, online platforms and websites.

4.3 Knowledge processes

Until this part (so far), the questionnaire applied more transversal and direct questions. However, in order to try to obtain a more practical and deeper use of the findings, this stage of the questionnaire – knowledge processes – applies more segmented questions, i.e. questions that focus on each process of the chain framework: knowledge acquisition, knowledge creation, knowledge transfer and knowledge sharing. This classification of the knowledge processes allows us to present results in a more clear and easy way.

4.3.1 Knowledge Acquisition Process

Bearing this in mind, and with respect to the process of knowledge acquisition, we are aware that this process encompasses several stages, such as the search for, identifying, selecting, collecting, organising, and mapping information/knowledge. However, only two of these specific activities were analysed. We selected “searching relevant articles” and “getting accesss to full documents” as the focus of our analysis. With respect to this, data revealed that the most used tools/online platforms (or websites) to search were the Google Scholar (28%), Scopus (26%) and Web of Science (22%). Complementary, to get access to full documents, the most used tools/websites are Google Scholar (30%), Institutional repositories (25%) and ResearchGate (24%).

4.3.2 Knowledge Creation Process

The second stage or process of this chain is the knowledge creation process. In order to better understand this stage, we firs asked our respondents about tools/websites they use to analyse documents, videos and pictures. The large majority of the participants (65%)

answered that they used quantitative and qualitative data analysis software, such as Excel (65%), SPSS (12%), WebQDA (10%) and NVIVO (8%).

The second question relates to the knowledge creation process and it aimed at assessing which type of software is more used by respondents to manage references. The surveyed participants pointed to RefWorks (42%) as the most used software, followed by EndNote (31%) and Mendeley (15%).

4.3.3 Knowledge Sharing Process

Knowledge sharing is the process of exchanging tacit knowledge through social and collaborative processes. Within this process, we included three main aspects: i) how researchers disseminate their research profiles; ii) how do they share their publications, and iii) how do they measure the impact of their scientific publication.

Most of respondents indicated that they use ResearchGate (28%) to deliver their research profile. Also Orcid is used (22%), as well as Google Scholar (21%) and Academia.edu (20%). Regarding the second aspect analysed, surveyed participants mentioned that the most used tools/sites to share documents (articles, posters and presentations) are: Academia.edu (34%), LinkedIn (26%) and Mendeley (19%).

On the last point – the impact of their scientific publications – respondents indicated that the most used tools/websites are: Scopus (48%), Web of Science (30%) and the Journal Citation Reports (JCR) with 20%.

4.3.4 Knowledge Transfer Process

The last process of the knowledge production chain is knowledge transfer. This process deals with transmitting explicit knowledge from one source/agent (individual, team/department, and/or organisation) to another. Here, we have chosen to focus only on publication activities in order to make our questionnaire and research process clearer. We did not consider, for example, patent creation and registration activities, among others. Related to the tools participants use to choose the journal where they wish to submit and to publish their articles, respondents indicated that the main tool used is Scopus (39%) followed by the JCR (29%). Participants also tend to archive their publications in ResearchGate (37%), ORCID (29%) and in other institutional repositories (29%).

5. Discussion and Conclusions

Throughout this paper, we have argued that there is a need to manage visibility and impact of knowledge production by implementing strategies and choosing appropriate tools.

The main theoretical implication of this exploratory study is the idea that knowledge production depends from the management of knowledge processes (acquisition, creation, transfer and sharing). Nevertheless, the value of that knowledge production depends on its visibility and subsequent academic and societal impact. The initial theoretical model proved to be very useful to build the questionnaire and to analyse data (Figure1). The questionnaire was simple and easy to understand by the respondents. Moreover, it revealed to be practical to analyse the answers and to better tackle and understand such a complex phenomenon as knowledge production.

We also learned from the sociology of professions that the concept of profession (different from that of occupation) and professional work still objects of discussion among sociologists. Nevertheless, there is an overall agreement that a profession implies high scientific and knowledge-based and frequently following years of higher/further education and even specified years of vocational training and experience, as well as the advanced division of labour (BRANTE, 1988; EVETTS, 2014; DIOGO, CARVALHO; AMARAL, 2015; CARVALHO, 2017).

Research management and/or administration “is still regarded by the literature as an abstract concept” (DERRICK; NICKSON, 2014, p. 26). Those authors think that the “concept of the research manager is undefined and it is still unclear”(DERRICK; NICKSON, 2014, p. 27). On this, also Atkinson and colleagues considered research management “as a profession which can be integrated into a theoretical model” (DERRICK; NICKSON, 2014, p. 19) based on the field of sociology of professions (CARVALHO and SANTIAGO, 2016b). We follow the argument of Timothy Atkinson and his colleagues about the need to legitimize the profession of research manager as a support to the work of researchers, highly specialized workers who should devote themselves to their field of knowledge (ATKINSON; GILLELAND; BARRETT, 2007).

In the particular case of the research centres, the research management plays an important role in the research process (DERRICK; NICKSON, 2014; SANTIAGO; CARVALHO,

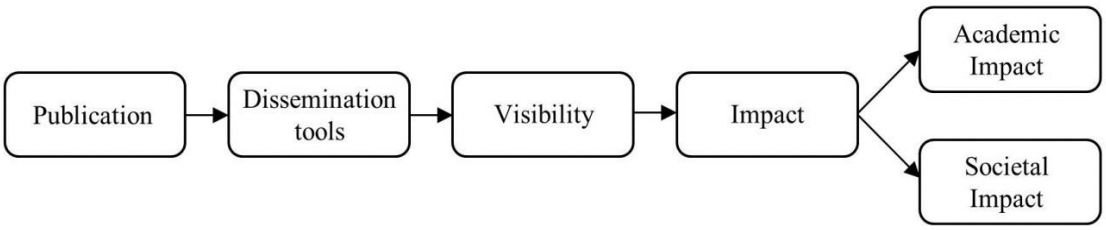
2016). This "research administrator" or "research manager" roles is becoming increasingly needed and pronounced as universities and researchers are competitive players to limited financial resources. In parallel, the prestige of any organization – and "even more for universities – is linked to its performance on international league tables, rankings and national research evaluation exercises" (ATKINSON; GILLELAND; BARRETT, 2007, p. 34). To perform well or excel in these competitive environments is becoming, more and more, related to the organization's ability to design, implementing and adjusting strategies successfully, as well as creating incentive rewards and training programs. In fact, these processes seem to be as more effective as more aligned they are, or, by other words, there is the need of thinking strategically and collectively, benefiting both and simultaneously the individual and organizational knowledge production. As Woelert (2015) refers, there are distinctive governance challenges arising from the increasing reliance on formalized knowledge in the governance of research activities. This shift requires the administration by a team of full-time professional workers in managing and administrating research. More and more, in practical terms and in our daily routines, some institutions follow these practices.

At a more practical level, namely in terms of organizational administration and management, this research leads us to think of several implications. For example, top and middle managers must care about knowledge value. Knowledge management is a challenging, but also a necessary task for project-based organizations, such as research centers, which tend to be less hierarchical than other types of organizations. In fact, this corroborates what Derrick and Nickson (2014, p. 26) referred about research management playing "(…) an important role in the research processes that result in technology transfer, knowledge brokering and sharing, scientific collaboration, grant success, industry involvement, productivity through publications, and even university student outcomes".

Managers must implement strategies to improve organizational knowledge processes. Looking at research centers as learning organizations for individuals, teams and groups gives us the perspective that the management of those organizations must provide research training, research information and data management support, in order to develop sustainable research capacity (GOMO, 2011). In this context knowledge management and research management have a natural link, because those organizations

are based on an intensive use of knowledge. We can look at the visibility and impact of publications through a **publication research chain impact** approach in order to simplify the process of thinking about a sequence of activities and actions thought to improve the visibility of research outputs and consequently to increase academic and societal impact (see Figure 2).

Figure 2 - Publication research chain impact model



Source: The authors (2018).

Traditionally, the process of knowledge creation is seen through a linear logic where the inputs are processed in order to originate outputs. According to this perspective, the process ends when the scientific academic article is published. Nevertheless, we defend that the value of knowledge is related to its use – being this use (more) applied or (more) theoretical. Researchers must go beyond this to better manage and use the process of publishing. We propose to look at the knowledge creation process as a dynamic chain which works with a kind of loop movement. By other words, as soon as outputs are available, they can be turned into new inputs, helping to create new and consolidated knowledge. This represents thus a new cycle of knowledge production, where publications need an accurate dissemination strategy, which in turn can and will improve visibility.

From a scientific communication perspective, the relationship between communicators and recipients can be divided in the so-called pull communication and push communication (MARCINKOWSKI; KOHRING, 2014). When the active communicator makes information available to an anonymous and dispersed public through appropriate channels (e.g. journal articles, science blogs) this is considered pull communication, but when university press offices and international relation offices send out e-mailings to "their" mailing lists this is classified as push communication (MARCINKOWSKI; KOHRING, 2014). Both of these communication strategies can be used by higher education

institutions and research centers, to think about and implement knowledge production visibility and use. Those organizations need to implement professional development and training in science communication in order to minimize the barriers that researchers face in publishing and disseminating their research (WEITKAMP, 2016).

For a global potential audience, the visibility of the knowledge that is produced by higher education institutions and research centers influences the impact of research. The research impact concept goes beyond the contributions to academia (SMITH; WARD; HOUSE, 2011). The UK Research Excellence Framework guideline defines research impact as "an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia" (RESEARCH EXCELLENCE FRAMEWORK, 2014, p. 6). In a similar way, the Australian Research Council defines research impact as "… the demonstrable contribution that research makes to the economy, society, culture, national security, public policy or services, health, the environment, or quality of life, (...)" (AUSTRALIAN RESEARCH COUNCIL, 2015).

According to the audience and users, we consider two potential types of impact: academic impact and societal impact. By academic, scholarly or scientific impact we refer to – in addition to the number of citations and publications produced – the different settings of applicability of the research object, e.g. when lecturing, in decision-making processes, enhancement and development of more knowledge, etc. (MORTON, 2015). On the other hand, the societal impact can be defined as "the connection and involvement of the university with the civil society, the creation of new products or innovation in common working processes, to sustain with relevant and accurate information political and social decisions, the capability of creating awareness among the civil society, …" (BORNMANN, 2013).

Traditionally, academics look to impact through a past perspective, e.g. by measuring the number of citations per article. However, we can look forward and think about creating an impact to a broader audience (researchers, practitioners, organizations and policymakers) by managing its critical antecedents (publication, dissemination and visibility). Bearing this in mind, it is valid to apply this chain logic at the individual, organizational and institutional levels.

At the individual level, sharing research and its findings can improve impact and development in the scientific field, where researchers belong or perceive their scientific

contributions. Consequently, and simultaneously, this will lead to an increased number of citations, to enhance and exchange the development of new ideas and to find potential new partnerships to richer collaborations inside research groups and networks (MÜLLER, 2012). To improve the researcher's individual visibility allows for broadening its audience: researchers all over the world can access to formal publications hosted in online platforms. When the researcher makes his/her research production available, he/she is making it easier for others, i.e., potential users to find his/her research. Those virtual spaces help users to find, access, choose, use and cite researchers' work. It is not enough to publish: to communicate scientific contributions is a critical and essential factor in building research visibility and impact (EGGHE; GUNS; ROUSSEAU, 2013; GUENTHER; JOUBERT, 2017).

At the organizational level, some research centers have concerns on improving the visibility of their research. A common and practical way of achieving this is to maintain updated platforms and websites with relevant information, along with publication lists, collaborators, projects, and knowledge expertise. Nevertheless, it is acknowledged that most of the research centers' main concern is to increase the number of publications. Research centers are agents of change and, they have an important role in knowledge transfer and sharing by acting as platforms for convergence, facilitating all knowledge processes (BRZAKOVIC; COZZENS, 2015) and authors.

At the institutional level, higher education institutions need visibility and impact strategies because it is fundamental to attract potential excellent people (collaborators, professors, researchers, students and staff, the so-called talents). Higher education institutions also need to disseminate research findings and publications just-in-time. Not only should higher education institutions be confined to the function of accountability, i.e. not only do they need to be accountable of their work, but they also need to make it visible to a wider audience and to the society (DE FILIPPO et al., 2012). To achieve this, it is crucial that information is updated regularly. Some institutions have invested in online repositories where research production is available through open access. This is quite significant because these repositories are crawled regularly by search engines and certainly enhance the visibility of higher education institutions research outputs. If those

mechanisms provide fluid knowledge flows, the links between education and research will be strengthened (TIGHT, 2016).

At the institutional level, there is still the belief, very much based on the age and mission of higher education institutions that it is challenging to implement change in these institutions, especially in universities, and to change them (authors). Institutionalism has enlightened us on the possible reasons for this, drawing attention to the increasing complexity and need to interconnect and create strong connections between knowledge producer institutions and their surroundings, being local, national or/and international. Additionally, there is still the need to figure how research centers and higher education institutions can align actions (at individual, team and organizational levels) to avoid duplication of administrative tasks, namely related to updating information regarding their knowledge production.

There is, in fact, a lack of strategic thinking, openness, innovation and missing opportunities for learning in research centers and for these to increase their competitive edge in the global market. Additionally, it is possible to observe, not only through the data obtained with the questionnaires, but also from our daily experience as academic workers, both in universities and research centers, that there is a need for innovation inside research centers, and that some organizational inertia that produces resistance to change needs to be overcome. Organizational inertia locks individual and groups competences, being then barriers to knowledge flows. Thus, the implementation of an effective knowledge management approach in research centers can help to transcend traditional silos. In turn, this will upgrade the role of research centers to knowledge organizations that are able to increase their competitive edge in the global market. Knowledge management can help to make connections among people with specialized and specific knowledge who use different languages and various tools, and facilitates the (increasing) work in virtual and multidisciplinary teams.

Limitations and directions for future research

The study we have presented, aims at identifying strategies and tools to increase knowledge production visibility and impact in higher education. By asking researchers and professors (academics) about their publications' procedures and habits, we explored the relationship between the use of tools used throughout the four knowledge processes and

the effective increase of the visibility of researchers' publications. Through these steps, it is expectable or at least it should be easier to track down or to assess the potentialities of the creation of new knowledge, both at the academic and societal levels. Nevertheless, our findings and data gathered are limited by the exploratory nature of this study. The visibility of research does not happen by chance: it needs to be managed in a strategic way, by the (individual) researchers, by the research projects, research centres and higher education institutions.

With respect to the methodology used, we have now consolidated steps to improve our questionnaire by including more areas of study as well as more questions in order to obtain answers that are more informative. For example, to ask when someone has finished their PhD to know if he/she has started to publish before or after concluding the thesis or even if he/she has not published at all during the process.

We are conscious of the limitations, but this actual study is still in an initial exploration. This exploratory study raises more questions than answers, a fact that leads us to identify potential future directions for research and more **food for thought**. A possible step to develop this research includes the need for more cross-disciplinary studies, and opportunities for future research at three main levels or fields of action. Theoretically and conceptually, there is still the need for conceptual refinement of the relationships and interactions between/among the elements of the knowledge processes chain framework (GARRISON; ARBAUGH, 2007; PINHO; ROSA, 2017).

At the empirical level, it would be interesting to include more quality-quantitatively-oriented studies in order to solidify our research and to gain insights on how, for example, the general trends such as digitization, social platforms, open access publication, and other recent and new processes impact on researcher's visibility, and which tools are used in these processes.

At a more practical level, and although quite challenging, it would enrich the study to know more about benchmarking on best-practices for developing and applying guidelines on research visibility. In fact, this leads us to another question that deserves more attention, namely how research centers support the collaborative nature of research? This aspect has also been tackled by Katz and Martin (1997), who refer that "collaboration can enhance the potential visibility of the work. Using their network of contacts, one's collaborators can diffuse the findings, either formally (e.g. through pre-prints, seminars

or conference presentations) or through informal discussions"(1997, p. 15). In parallel, the issue of "performance alignment" or "activities' alignment" of research centers (and other knowledge producer institutions) seems to be of paramount importance to us. By other words, we wonder how universities, research centers and research groups can align its performance measurement systems with strategies and actions that can enhance the potential visibility and impact of the work of its members.

The reasons why we tend to emphasize the alignment of performance and research activities, and research knowledge management, i.e. the combination of knowledge management and the alignment of micro-services for researchers and managers of research centers lay on the belief that synergies and mutual benefits are created for institutions. Moreover, within the academic context, "waste" can be produced at several levels with similar patterns. The most important (or common) is waste of time on "unnecessary duplicated" activities and processes, as for example multiple data entries with different names or surnames, which can be easily solved by using persistent identifiers for authors, organizations and institutions to facilitate data processing automation. Moreover, it improves search accuracy and also supports the unambiguous connections between researchers and their research and their affiliations (GASPARYAN et al., 2016). On the other hand, and somehow paradoxically, research centers and other knowledge producers institutions should spend more efforts in assessing their outcomes and procedures after the publication process.

Either successful or not, a reflection should be taken upon the questions: what was done, which strategies and/or procedures were applied? What can be done to improve and to meet successful outcomes? Assessment procedures after publication should also involve strategic planning. What seems to happen in most research centers is that success assumes, almost exclusively, the form of numbers: at the end of the year, or any "evaluation period" researchers are asked to fill a list with all their publications of that period, and not much more is done. The evaluation of research centers should not be only based on the sum of publications of each of its members. The evaluation process should also measure (and assess) to what extent research centers support researchers, which type of co-creation knowledge environment does it incite, how it uses the results and outcomes of the evaluations for its improvement, how it gives the opportunity to conciliate lecturing and research, etc. Furthermore, the scientific system of a country

should not be measured through the sum of publication of the various scientific institutions, although bibliometric indicators can be “socially transformative” (HAZELKORN, 2015; 2016), leading to wrong (general) assumption that successful systems performance are merely the aggregate of institutional performances.

In sum, “alignment” (or even research governance) works as a key word that should be sponsored at the level of management (or by top managers), and the advantages of the use of identifiers at all operational levels should be promoted. At the organizational and individual level, the use of persistent identifiers, such as Orcid should be encouraged through information and awareness creation about its benefits (e.g. time-saving) best practices. As this type of ID is linked to referential databases as SCOPUS and FCT, it has a twofold benefit of increasing visibility while simultaneously reducing administrative work.

This governance perspective that cuts across all layers (micro – individual; meso – organizational; and macro – national system, as conceptualized by Woelert (2015), where knowledge processes happen can deliver mechanisms for improving visibility and impact of knowledge production in higher education. Advances in technology allow research centers to offer proactive knowledge management services through multiple channels and open infrastructures. Growing interoperability, between diverse digital collaborative platforms, is the challenge to facilitate knowledge processes in research centers. A global research dissemination and communication system needs work with an interoperability perspective. Knowledge management connects people which are simultaneously knowledge suppliers and knowledge users of this global system.

We are acknowledged that science is “organized in various areas of knowledge and each of these areas has been further divided into fields, subfields, disciplines” (MARTÍN-MARTÍN; ORDUNA-MALEA; DELGADO LÓPEZ-CÓZAR, 2018, p. 1251). These units seek to build their identity by identifying their “own” objects, principles, methods and techniques. Those social processes create territories of knowledge (disciplines) and build tribes where knowledge workers interact (BECHER; TROWLER, 2001), establishing also epistemic communities (HAAS, 1992). Knowledge management should take all those aspects into account. However, it should also seek to look beyond these boundaries by identifying common activities, cross-cutting and specific problems in the implementation of these activities and provide information and training to facilitate research work in order to enhance the effectiveness of knowledge processes and improve science communication.

Referências

AUSTRALIAN RESEARCH COUNCIL. *Research impact principles and framework*. Canberra: ARC, 2015.

ATKINSON, T. N.; GILLELAND, D. S.; BARRETT, T. G. The dimensions of influence on research administrator behavior: Toward a theoretical model of research administration as a public service profession. *Journal of Research Administration*, v. 38, n. 1, p. 19, 2007.

AURANEN, O.; NIEMINEN, M. University research funding and publication performance: an international comparison. *Research Policy*, v. 39, n. 6, p. 822-834, 2010.

BECHER, T.; TROWLER, P. *Academic tribes and territories*: intellectual enquiry and the culture of disciplines. Berkshire: Society for Research into Higher Education & Open University Press, 2001.

BOARDMAN, P. C.; CORLEY, E. A. University research centers and the composition of research collaborations. *Research Policy*, v. 37, n. 5, p. 900-913, 2008.

BORNMANN, L. Scientific peer review. *Annual Review of Information Science and Technology*, v. 45, n. 1, p. 197-245, 2011.

_____. What is societal impact of research and how can it be assessed? A literature survey. *Journal of the American Society for Information Science and Technology*, v. 64, n. 2, p. 217-233, 2013.

BRANTE, T. Sociological Approaches to the Professions. *Acta Sociologica*, v. 31, n. 2, p. 119-142, april, 1988.

BRANTE, T.; FULLER, S.; LYNCH, W. *Controversial Science*: from content to contention. Albany: State University of New York Press, 1993.

BRZAKOVIC, D.; COZZENS, J. H. Academic Research Centers: Platforms for Convergence of Science, Technology, and Innovation. In: BAINBRIDGE, W. S. e ROCO, M. C. (Ed.). *Handbook of Science and Technology Convergence*: Springer International Publishing, 2015.

CARLINO, G. A. Knowledge spillovers: cities' role in the new economy. *Business Review*, v. 4, p. 17-24, 2001.

CARVALHO, T. The Study of the Academic Profession: Contributions from and to the Sociology of Professions. In: HUISMAN, J.; TIGHT, M. (Ed.). *Theory and Method in Higher Education Research*. [S.l.]: Emerald Publishing, 2017.

CARVALHO, T.; DIOGO, S. Exploring the relationship between institutional and professional autonomy: a comparative study between Portugal and Finland. *Journal of Higher Education Policy and Management*, v. 40, n. 1, p. 18-33, 2018.

CARVALHO, T.; SANTIAGO, R. (Ed.). *Professionalism, Managerialism and Reform in Higher Education and the Health Services*: The European Welfare State and the Rise of the Knowledge Society. UK: Palgrave Macmillan, 2015.

_____. Professionalism and knowledge. *The Routledge Companion to the Professions and Professionalism*, p. 144, 2016a.

_____. Professionalism and knowledge. In: DENT, M.; BOURGEAULT, I. et al. (Ed.). *The Routledge Companion to the Professions and Professionalism*. London: Routledge, 2016b.

COLLINS, H. M. The TEA Set: Tacit Knowledge and Scientific Networks. *Science Studies*, v. 4, n. 2, p. 165-185, abr., 1974.

CRESWELL, J. W. Research design: qualitative, quantitative, and mixed methods approaches. 3rd ed. Los Angeles: Sage, 2009.

DE FILIPPO, D. et al. Visibility in international rankings. Strategies for enhancing the competitiveness of Spanish universities. *Scientometrics*, p. 1-18, 2012.

DELAMONT, S. Academic writing in a global context: the politics and practices of publishing in English. *Studies in Higher Education*, v. 36, n. 4, p. 505-506, jun. 2011.

DERRICK, G.; NICKSON, A. Invisible Intermediaries: a Systematic Review into The Role of Research Management in University and Institutional Research Processes. *Journal of Research Administration*, v. 45, n. 2, p. 11-45, Fall, 2014.

DERRICK, G. E.; SAMUEL, G. N. The Evaluation Scale: Exploring Decisions About Societal Impact in Peer Review Panels. *Minerva*, v. 54, n. 1, p. 75-97, mar. 2016.

DIOGO, S.; CARVALHO, T.; AMARAL, A. *Institutionalism and organizational change*. (Ed.). London: The Palgrave International Handbook of Higher Education Policy and Governance, 2015.

DOYLE, J.; CUTHILL, M. Does 'get visible or vanish' herald the end of 'publish or perish'? Higher Education Research & Development, v. 34, n. 3, p. 671-674, maio 2015.

EGGHE, L.; GUNS, R.; ROUSSEAU, R. Measuring co-authors' contribution to an article's visibility. *Scientometrics*, v. 95, n. 1, p. 55-67, 2013.

ENGELS, T. C. E.; OSSENBLOK, T. L. B.; SPRUYT, E. H. J. Changing publication patterns in the Social Sciences and Humanities, 2000-2009. *Scientometrics*, v. 93, n. 2, p. 373-390, 2012.

EVETTS, J. The Concept of Professionalism: Professional Work, Professional Practice and Learning. In: BILLETT, S.; HARTEIS, C., et al (Ed.). International Handbook of Research in Professional and Practice-based Learning. Dordrecht: Springer Netherlands, 2014.

GARRISON, D. R.; ARBAUGH, J. B. Researching the community of inquiry framework: Review, issues, and future directions. *The Internet and Higher Education*, v. 10, n. 3, p. 157-172, 2007.

GASPARYAN, A. Y. et al. Scientific author names: errors, corrections, and identity profiles. *Biochemia Medica*, v. 26, n. 2, p. 169-173, 2016.

GIBBONS, M. et al. *New Production of Knowledge*: The Dynamics of Science and Research in Contemporary Societies. London: Sage, 1994.

GODIN, B. Science, accounting and statistics: The input-output framework. *Research Policy*, v. 36, n. 9, p. 1388-1403, 2007.

GOMIDE, J.; KLING, H.; FIGUEIREDO, D. Name usage pattern in the synonym ambiguity problem in bibliographic data. *Scientometrics*, v. 112, n. 2, p. 747-766, august, 2017.

GOMO, E. Towards Sustainable Research Capacity Development and Research Ownership for Academic Institutes in Developing Countries: The Malawian Research Support Centre Model. *Journal of Research Administration*, v. 42, n. 1, p. 38-45, Summer, 2011.

GUENTHER, L.; JOUBERT, M. Science communication as a field of research: Identifying trends, challenges and gaps by analysing research papers. *Journal of Science Communication*, v. 16, n. 2, 2017.

HAAS, P. M. Introduction: epistemic communities and international policy coordination. *International organization*, v. 46, n. 1, p. 1-35, 1992.

HAZELKORN, E. Globalization, internationalization and rankings. *International Higher Education*, n. 53, 2015.

_____. *Could HE rankings be socially transformative*. United Kingdom: University World News, 2016.

HESS, C.; OSTROM, E. Introduction: an Overview of the Knowledge Commons. In: HESS, C.; OSTROM, E. (Ed.). *Understanding Knowledge as a Commons*: From Theory to Practice. London: MIT Press, 2007.

JOSHI, K. D.; SARKER, S.; SARKER, S. Knowledge transfer within information systems development teams: examining the role of knowledge source attributes. *Decision Support Systems*, v. 43, n. 2, p. 322-335, 2007.

KATZ, J. S.; MARTIN, B. R. What is research collaboration?. *Research Policy*, v. 26, n. 1, p. 1-18, mar. 1997.

MAQABLEH, M. et al. The Impact of Social Media Networks Websites Usage on Students´ Academic Performance. *Communications and Network*, v. 7, n. 4, p. 13, 2015.

MARCINKOWSKI, F.; KOHRING, M. The changing rationale of science communication: a challenge to scientific autonomy. *Journal of science communication*, v. 13, n. 3, p. 4, 2014.

MARTÍN-MARTÍN, A.; ORDUNA-MALEA, E.; DELGADO LÓPEZ-CÓZAR, E. A novel method for depicting academic disciplines through Google Scholar Citations: The case of Bibliometrics. *Scientometrics*, v. 114, n. 3, p. 1251-1273, mar. 2018.

MARTÍNEZ, R. A.; ANDERSON, T. Are the most highly cited articles the ones that are the most downloaded? A bibliometric study of IRRODL. *The International Review of Research in Open and Distributed Learning*, v. 16, n. 3, p. 18-40, 2015.

MARTYNA, Ś.; JOHANSSON, M. Playing in the academic field: Non-native English-speaking academics in UK business schools. *Culture and Organization*, v. 21, n. 1, p. 78-95, 2015.

MAYORDOMO, R. M.; ONRUBIA, J. Work coordination and collaborative knowledge construction in a small group collaborative virtual task. *The Internet and Higher Education*, v. 25, p. 96-104, abr. 2015.

MCGRAIL, M. R.; RICKARD, C. M.; JONES, R. Publish or perish: a systematic review of interventions to increase academic publication rates. *Higher Education Research & Development*, v. 25, n. 1, p. 19-35, 2006.

MCKIERNAN, E. C. et al. How open science helps researchers succeed. *eLife*, v. 5, p. 1-19, jul. 2016.

MELERO, R. Altmetrics - a complement to conventional metrics. *Biochemia Medica*, v. 25, n. 2, p. 152-160, 2015.

MIRNEZAMI, S. R.; BEAUDRY, C.; LARIVIÈRE, V. What determines researchers' scientific impact? A case study of Quebec researchers. *Science and Public Policy*, v. 43, n. 2, p. 262-274, 2016.

MORTON, S. Progressing research impact assessment: A 'contributions' approach. *Research Evaluation*, v. 24, n. 4, p. 405-419, Oct., 2015.

MÜLLER, R. Collaborating in life science research groups: The question of authorship. *Higher Education Policy*, v. 25, n. 3, p. 289-311, 2012.

MUSSELIN, C. How peer review empowers the academic profession and university managers: Changes in relationships between the state, universities and the professoriate. *Research Policy*, v. 42, n. 5, p. 1165-1173, 2013.

NONAKA, I.; TOYAMA, R.; KONNO, N. SECI, Ba and leadership: a unified model of dynamic knowledge creation. *Long Range Planning*, v. 33, n. 1, p. 5-34, 2000.

NONAKA, I.; VON KROGH, G.; VOELPEL, S. Organizational knowledge creation theory: evolutionary paths and future advances. *Organization Studies*, v. 27, n. 8, p. 1179-1208, 2006.

O' DELL, C. S.; GRAYSON, C. J. *If only we knew what we know*: the transfer of internal knowledge and best practice. New York: Free Press, 1998.

ONODERA, N.; YOSHIKANE, F. Factors affecting citation rates of research articles. *Journal of the Association for Information Science & Technology*, v. 66, n. 4, p. 739-764, 2015.

PINHO, I.; ROSA, M. J. Research Evaluation: the need to include processes and impact. IN: CONGRESSO INTERNACIONAL DESAFIOS DA QUALIDADE EM INSTITUIÇOES DE ENSINO, 2., 2017, Coimbra. *Proceedings...* Coimbra: Escola Superior de Enfermagem de Coimbra, 2017.

POLANYI, M. *The Tacit Dimension*. London: Routledge, 1967.

RESEARCH EXCELLENCE FRAMEWORK. *Research Excellence Framework 2014*: The results. Bristol: REF, 2014.

SANTIAGO, R.; CARVALHO, T. Mudança no conhecimento e na profissão acadêmica em Portugal. Cadernos de Pesquisa, São Paulo, v. 41, p. 402-426, 2011.

_____. The "Dark Side of the Moon": The Non-Teaching Structures in the Portuguese Higher Education Institutions. In: SARRICO, C.; TEIXEIRA, P., et al. (Ed.). *Global Challenges, National Initiatives, and Institutional Responses*. Rotterdam: Sense, 2016.

SANTIAGO, R.; CARVALHO, T.; FERREIRA, A. Changing knowledge and the academic profession in Portugal. *Higher Education Quarterly*, v. 69, n. 1, p. 79-100, 2015.

SEYFANG, G.; SMITH, A. Grassroots innovations for sustainable development: Towards a new research and policy agenda. *Environmental Politics*, v. 16, n. 4, p. 584-603, ago. 2007.

SMITH, S.; WARD, V.; HOUSE, A. 'Impact' in the proposals for the UK's Research Excellence Framework: Shifting the boundaries of academic autonomy. *Research Policy*, v. 40, n. 10, p. 1369-1379, 2011.

SOUSA, C.; HENDRIKS, P. Connecting Knowledge to Management: The Case of Academic Research. *Organization*, v. 15 n. 6, p. 811-830, 2008.

TARDY, C. The role of English in scientific communication: Lingua franca or Tyrannosaurus rex?. *Journal of English for Academic Purposes*, v. 3, n. 3, p. 247-269, 2004.

TIAN, J.; NAKAMORI, Y.; WIERZBICKI, A. P. Knowledge management and knowledge creation in academia: a study based on surveys in a Japanese research university. *Journal of Knowledge Management*, v. 13, n. 2, p. 76-92, 2009.

TIGHT, M. Examining the research/teaching nexus. *European Journal of Higher Education*, v. 6, n. 4, p. 293-311, 2016.

TURNER, J. R.; PETRUNIN, K. Creating Self-Generating Knowledge Sharing Spirals: Improving Motivation in a Knowledge Economy. *Performance Improvement*, v. 54, n. 7, p. 20-25, 2015.

UNITED NATIONS. *Transforming our world*: The 2030 agenda for sustainable development. New York: UN - General Assembly, 2015.

VAN NOORDEN, R. Online collaboration: Scientists and the social network. *Nature*, v. 512, n. 7513, p. 126-129, 2014.

VAN RAAN, A. Properties of journal impact in relation to bibliometric research group performance indicators. *Scientometrics*, v. 92, n. 2, p. 457-469, ago. 2012.

VAN WEIJEN, D. The language of (future) scientific communication. *Research trends*, v. 31, nov. 2012.

WALTMAN, L.; TRAAG, V. A. Use of the journal impact factor for assessing individual articles need not be wrong. *Computer Science*, mar., 2017.

WANG, X. et al. The open access advantage considering citation, article usage and social media attention. *Scientometrics*, v. 103, n. 2, p. 555-564, 2015.

WEITKAMP, E. Filling the Gaps: Exploring researchers communication experiences. *Journal of Science Communication*, v. 15, n. 6, p. 1-4, 2016.

WOELERT, P. Governing Knowledge: The Formalization Dilemma in the Governance of the Public Sciences. *Minerva*, v. 53, n. 1, p. 1-19, mar. 2015.

Recebido em: 10/02/2018

Aceito para publicação em: 14/11/2018

Annex 1. *Online tools*

a) To manage references

EndNote	"More than just a reference manager. EndNote moves you through the research process as you search, organize, write, publish and share"	http://endnote.com/
Mendeley	"Mendeley is a free reference manager and academic social network that can help you organize your research, collaborate with others online, and discover the latest research."	https://www.mendeley.com
Papers	"Papers helps you collect and curate the research material that you're passionate about. This award-winning reference manager will improve the way you find, organize, read, cite and share"	http://www.papersapp.com/
RefWorks	"basic features of RefWorks including creating your database, managing your references and generating bibliographies"	http://www.refworks.com/
Zotero	"is a free, easy-to-use tool to help you collect, organize, cite, and share your research sources"	https://www.zotero.org/

b) To search relevant literature

Google Scholar	"Google Scholar Library allows you to build your personal collection of articles within Scholar"	https://scholar.google.com
Scielo	"SciELO - Scientific Electronic Library Online is a model for cooperative electronic publishing of scientific journals on the Internet. Especially conceived to meet the scientific communication needs of developing countries, particularly Latin America and the Caribbean countries, it provides an efficient way to assure universal visibility and accessibility to their scientific literature, contributing to overcome the phenomena known as 'lost science'." "SciELO Model is product of a partnership among FAPESP (http://www.fapesp.br)– the State of São Paulo Science Foundation, BIREME (http://www.bireme.br) - the Latin America and Caribbean Center on Health Sciences Information, as well as national and international institutions related to scientific communication and editors"	http://www.scielo.org/
Scopus	"Scopus is the largest abstract and citation database of peer-reviewed literature: scientific journals, books and conference proceedings."	http://www.scopus.com/
Web of Science	"With the Web of Science platform, you can access an unrivalled breadth of world-class research literature linked to a rigorously selected core of journals and uniquely discover new information through meticulously captured metadata and citation connections. The Web of Science platform connects the Web of Science Core Collection to regional citation indexes, patent data, specialized subject indexes, and an index of research data sets, all in all totaling over 33,000 journals, meaning you have the breadth you need to be truly comprehensive in your search."	http://wokinfo.com/

c) To get access to full documents

arXiv	"Open access to 1,284,453 e-prints in Physics, Mathematics, Computer Science, Quantitative Biology, Quantitative Finance and Statistics"	http://arxiv.org
Open Access button	"Free, legal research articles and data delivered instantly or automatically requested from authors."	https://openaccessbutton.org/
ResearchGate	"ResearchGate is built by scientists, for scientists." "ResearchGate today has more than 13+ million members." "Our mission is to connect the world of science and make research open to all.	http://www.researchgate.net

Continua

Continuação

d) Data analysis:

Excel	"Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications." (Wikipedia)	http://microsoft.office.com/excel
NVivo	"NVivo is software that supports qualitative and mixed methods research. It's designed to help you organize, analyze and find insights in unstructured, or qualitative data like: interviews, open-ended survey responses, articles, social media and web content."	http://www.qsrinternational.com/product
R	"R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows and MacOS."	https://www.r-project.org
SPSS	"SPSS Statistics addresses the entire statistical analysis process - planning, data collection, analysis, reporting - for better decision making and performance."	http://www-01.ibm.com/software/analytics/spss/
WebQDA	"webQDA is a software to support the analysis of qualitative data in a collaborative and distributed environment." "webQDA follows the structural and theoretical design of other programs available in the market, differentiating itself by providing online, real-time collaborative work and a service that supports the research process."	https://www.webqda.net

e) To archive/share articles, posters and presentations:

Academia.edu	"Academia is the easiest way to share papers with millions of people across the world for free."	http://www.academia.edu/
Institutional repository	"An institutional repository is an archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution" (Wikipedia)	(example: http://ria.ua.pt/)
SlideShare	"Share what you know and love through presentations, infographics, documents and more"	http://slideshare.net
SSRN	"SSRN is a worldwide collaborative of over 330,600 authors and more than 2.2 million users that is devoted to the rapid worldwide dissemination of research."	http://www.ssrn.com
YouTube	"YouTube is an American video-sharing website headquartered in San Bruno, California." "YouTube allows users to upload, view, rate, share, add to favorites, report, comment on videos, and subscribe to other users" (Wikipedia)	https://www.youtube.com

f) To decide which journal to submit

DOAJ	"DOAJ (Directory of Open Access Journals) is a community-curated online directory that indexes and provides access to high quality, open access, peer-reviewed journals."	https://doaj.org
Journal Impact Factor in JCR	"A *Journal Citation Reports* subscription gives you a systematic, objective means to evaluate the world's leading scientific and scholarly journals. By analyzing citation references, *Journal Citation Reports* measures research influence and impact at the journal and category levels, and shows the relationship between citing and cited journals."	https://clarivate.com/products/journal-citation-reports/
Journalysis	"Journalysis is a new Open Access (free) platform that will allow academic authors to share their experiences (both good and bad) of submitting to specific journals. By sharing information about those journals with high standards and those with low standards, authors can be better informed when making decisions about where to submit their next manuscript. Impact factors vary and were never designed for differentiating between journals in this way, so by summarising information about authors' experiences, metrics and commentaries will become a powerful addition to the decision making process." (Linkedin)	http://www.journalysis.org/

Continua

Conclusão

SJR	"The SCImago Journal & Country Rank is a publicly available portal that includes the journals and country scientific indicators developed from the information contained in the Scopus® database. These indicators can be used to assess and analyze scientific domains. Journals can be compared or analysed separately. Country rankings may also be compared or analysed separately. Journals can be grouped by subject area, subject category or by country."	http://www.scimagojr.com/

g) To measure the impact of your scientific production

Altmetric	"At Altmetric, we work behind the scenes, collecting and collating all of this disparate information to provide you with a single visually engaging and informative view of the online activity surrounding your scholarly content."	http://www.altmetric.com/
PLoS Article-Level Metrics	"Traditionally, the impact of research articles has been measured by the publication journal. But a more informative view is one that examines the overall performance and reach of the articles themselves. Article-Level Metrics (ALM) capture the manifold ways in which research is disseminated and used."	http://alm.plos.org/

h) Online CV:

Europass	"Five documents to make your skills and qualifications clearly and easily understood in Europe: Two documents freely accessible (Curriculum Vitae; Language Passport)." "You can create your CV online using tutorials or download the template, examples and instructions."	https://europass.cedefop.europa.eu
FCT - DeGóis	"The DeGóis Platform is a tool for gathering, supplying and analyze the intellectual and scientific production of the Portuguese researchers, provided by MEC - Ministry of Education and Science, through FCT - Foundation for Science and Technology"	http://www.degois.pt/
FCT - SIG	"The FCT Information System (FCT-SIG) was created to give its users (researchers, science and technology managers, etc.) the possibility of checking and customizing the personal data they have made available to FCT in order to gain access to its multiple systems and to update and access other individual data in a private and secure fashion."	https://sig.fct.pt/fctsig/
Lattes	The Lattes Platform represents the CNPq experience in integrating databases of Curricula, Research Groups and Institutions into a single Information System." "The Lattes Curriculum became a national standard in the record of students' and researchers'past and current lives in the country, and is now adopted by most of the country's development institutions, universities and research institutes.	http://lattes.cnpq.br/
Linkedin	"LinkedIn is the world's largest online professional network with more than 500 million members in over 200 countries."	https://www.linkedin.com/
ORCID	"ORCID provides a persistent digital identifier that distinguishes you from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between you and your professional activities ensuring that your work is recognized"	http://orcid.org/
ResearcherID	"ResearcherID provides a solution to the author ambiguity problem within the scholarly research community. Each member is assigned a unique identifier to enable researchers to manage their publication lists, track their times cited counts and h-index, identify potential collaborators and avoid author misidentification. In addition, your ResearcherID information integrates with the Web of Science and is ORCID compliant, allowing you to claim and showcase your publications from a single one account. Search the registry to find collaborators, review publication lists and explore how research is used around the world"	www.researcherid.com

Potencializando a Visibilidade e o Impacto da Pesquisa Acadêmica: um estudo exploratório sobre as configurações de produção de conhecimento

Resumo

Resumo: O trabalho de investigação e a produção de conhecimento carecem de estratégias de visibilidade e de impacto. A nível individual, os investigadores devem partilhar os seus outputs e divulgar resultados, como publicações, patentes, etc. Além disso, o trabalho de investigação é um espaço colaborativo baseado em procedimentos formais e informais. A literatura na área argumenta que existe a necessidade de melhorar a visibilidade da investigação de forma de aumentar o seu impacto, tanto no nível académico como a nível societal. Este artigo é baseado em estudos recentes sobre a monitorização e a avaliação orientados para o impacto. A fim de identificar ferramentas e estratégias que os investigadores usam neste domínio, foi desenvolvido um estudo exploratório em dois centros de investigação ou de pesquisa (vinculados a Universidades) em Portugal. Os resultados preliminares mostram a necessidade de implementar estratégias nos níveis organizacional e individual que definam a relevância da produção de conhecimento para o centro de investigação, ao mesmo tempo em que promovam a visibilidade e o impacto dessa produção.
Palavras-chave: Comunicação académica. Visibilidade da investigação. Produção de conhecimento. Impacto da investigação ou pesquisa. Comunicação científica. Ensino superior.

Potencializando la Visibilidad y el Impacto de la Investigación Académica: un estudio exploratorio sobre las configuraciones de producción de conocimiento

Resumen

El trabajo de investigación y la producción de conocimiento carecen de estrategias de visibilidad e impacto. En el ámbito individual, los investigadores deben compartir sus resultados y difundir sus outputs, como publicaciones, patentes, etc. Además, el trabajo de investigación es un espacio de colaboración basado en procedimientos formales e

informales. La literatura en el área arguye que es necesario mejorar la visibilidad de la investigación para mejorar su impacto, tanto en el ámbito académico como también en lo social. Este artículo se basa en estudios recientes sobre monitoreo y evaluación orientados al impacto. Con el objetivo de identificar las herramientas y estrategias de los investigadores utilizadas para hacer frente a esta situación, se desarrolló un estudio exploratorio en dos centros de investigación universitarios en Portugal. Los resultados preliminares muestran la necesidad de implementar estrategias en el ámbito organizativo e individual que definan la relevancia de la producción de conocimiento para el centro de investigación, al mismo tiempo que promuevan la visibilidad y el impacto de esta producción.

Palabras clave: Comunicación académica. Visibilidad de la investigación. Producción de conocimiento. Impacto de la investigación. Comunicación científica. Educación Superior.