Chapter 7
Teaching Digital Competence and Scholarly Communication:
Ten Years Moving Researchers to Digital Scholarship at Pablo de Olavide University

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EXECUTIVE SUMMARY

The objective of the Research Support Services of the Universidad Pablo de Olavide Learning and Research Resource Center is to contribute to the improvement of the research processes as well as to maximize the results obtained and their evaluation. To this end, it offers bibliographic information and reference services, advice on the processes of publication, and evaluation, both individual and collective; standardization and digital academic identity; and, of course, training in all these areas within the context of the intensive use of digital media. For some years now, the LRRC's training of researchers has focused on the use of digital media as a part of the research process and has also integrated into the research staff training plan of the university that manages the corresponding service with which the LRRC collaborates very actively.

INTRODUCTION

The intensive use of digital tools in research processes, knowledge creation and communication are, at this stage, a reality that no researcher should ignore. However, the rapid changes that occur, both through the automation of old procedures and by the birth of new ones in the use of digital techniques can cause those researchers who do not possess the right skills to be affected and be distanced from those who do have them (JISC & British Library, 2012; Secker, 2012; Tsatsou, 2018).

University libraries, which have traditionally trained their users in managing sources and information resources, have been trying for years to improve the training of researchers in the digital field with ambitious programs and initiatives.

In 2013, the Association of College & Research Libraries of the American Library Association put the matter on the table in the so-called *Intersections White Paper* (Association of College and Research Libraries. Working Group on Intersections of Scholarly Communication and Information Literacy, 2013) to address what was obvious: the need to try to transform the way in which competences are perceived and transmitted in information in the academic environment, assuming that what is digital permeates everything.

It is around this time that some authors began to highlight the change in the strong link between what is digital and new ways of scientific production and communication, including the movement for open access to science, as one of the most obvious manifestations of open systems (Basili, 2017; Friesen, Gourlay, & Oliver, 2013).

At this point, authors such as Smith-Rumsey started to define digital scholarship in the following terms:

What is new-model scholarly communication? By scholarly communication we mean the authoring, publishing, stewardship, and use of scholarship. Digital scholarship is the use of digital evidence and method, digital authoring, digital publishing, digital curation and preservation, and digital use and reuse of scholarship. And new-model scholarly communication is what results when we put those digital practices into the processes of production, publishing, curation, and use of scholarship. (Smith-Rumsey, 2011, p. 2).

As proof of this are the results of the study conducted in 2015 by Kramer and Bosman (2015). Moreover, recent European works have connected digital competence with the processes of scientific research and communication and, more generally speaking, with the context of Open Science, in this case from the perspective of the DigComp framework (McCaffrey et al., 2020).

This paper describes the efforts that are being made by the Universidad Pablo de Olavide Learning and Research Resource Center (LRRC) to make researchers work properly in the digital environment, through formal training plans and on-demand information actions.

RESEARCH SUPPORT SERVICES IN ACADEMIC LIBRARIES

But what form do library services take to respond to these changes?

Using as an example the case of Spanish academic libraries, there is a first work in which Varela-Prado and Baiget (2012) proposed services information search skills, advice on scientific publication, repositories and data curation, open data and linked data and cooperation and multidisciplinary actions as the future trends in research support.

Numerous later works continued in this line. One of them, published in 2015, referring to the Universidad de Navarra, lists the services that have been provided so far by thematic librarians:

- *review and ensure the availability of the recommended literature of the subjects in their respective areas.*
- *control magazine budgets.*

- *provide training sessions at all levels (1st graders, preparatory sessions for the preparation of end-of-degree and master's degree work, in graduate programs, and academic staff).*
- *develop thematic guides with the SubjectsPlus program.*
- *validate the items* [sic] *of scientific production included in the University's research management database, científicacvn, which we will explain later* (Iribarren-Maestro, Grandal, Alecha, Nieva, & San-Julián, 2015, p. 133)

Also, from this year is the work of Tovar Sanz (2015) who, through the direct and selective observation of the information displayed by the Spanish libraries on their websites, emphasized the following:

- Access to the document
- Training users
- Editorial orientation
- Bibliometric guidance
- Copyright
- Institutional repository
- Calls for evaluation
- Research profile
- Bibliographical search
- Thematic advice
- Support for research funding

At the same time, another work analyzed the specific case of the Library Rector Gabriel Ferraté (Universitat Politècnica de Catalunya) concerning the scientific production portal of researchers, FUTUR (2020), mainly highlighting three axes of action (Codina-Vila & Íñigo, 2015):

- Boosting unique identifiers
- Open Access Publishing Advice
- Analysis of scientific publication on campus

Although published later, in 2015 as well, Fernández Marcial and González-Solar (2017) presented a study on the services of digital identity management in which they also analyze the research support services that would be provided by the academic libraries. More recently, in 2018, a new work provided a new analysis of Spanish university libraries, in this case (Rey Martín, Camón Luis, & Pacheco, 2018).

The integration of skills, first computer and informational, and later digital ones, in university teaching, has been one of the main objectives that has been marked by the Conference of Rectors of Spanish Universities (CRUE[1]) through the sector commission of libraries, REBIUN. In 2016 DigComp was adapted by REBIUN in order to be included in the training of undergraduate and postgraduate students from Spanish universities. For this purpose, an adaptation of DigComp (2016) and Digital Competency Descriptor Equivalence (DigComp) with the CI2 (2015) has been carried out to establish the equivalence between the objectives, contents, materials and evaluation systems of the three CI2-based levels to the new three that do so in DigComp[2].

Universidad Pablo de Olavide is a young Spanish public higher education institution founded in 1997. It is located in Seville, where it shares an area of influence with the Universidad de Sevilla, one of the

Spanish university system's historical institutions of higher education, founded in the sixteenth century. Compared to this, and other Spanish universities, Pablo de Olavide is a small organization.

The University is in a campus on the outskirts of the city of Seville but connected to it by road, bus and a metro line. In addition, it has two more offices, one in the neighboring town of Carmona, mainly for its Summer School, and another, for institutional representation, in the center of the city of Seville. In addition, there is an associated center, located in the city itself, that teaches some undergraduate degrees.

This unique campus was built by reusing the premises of a former educational institution that occupied them until the late 1980s. It is an area of 126 hectares, in which all the teaching and research infrastructures of the University are located, and also the Andalusian Center for Developmental Biology (CABD). This includes classrooms, offices, laboratories, management areas and sports facilities. In addition, within the campus is also the Instituto de la Grasa (the Institute of Fats), a research center of the Spanish National Research Council (CSIC). Most of the buildings have been rehabilitated and adapted to the different activities that take place at the University.

Currently, just over 12,000 students are enrolled, in undergraduate and graduate programs, including master and doctoral programs. The degrees taught belong to the fields of Science, Humanities and Social Sciences, including Legal and Economic and Management Sciences. There are currently 39 undergraduate and 51 graduate degrees, including 9 doctoral programs which depend on 6 faculties and the Higher Polytechnic School, as well as the Postgraduate Studies Center and the Doctoral School in the case of these degrees.

Around a thousand academic staff (including assistants and associates) work at this university, although just over 40% are hired part-time, as associate lecturers. They are organized in 15 Departments and 10 research centers, some mixed, such as the Andalusian Center for Developmental Biology, in collaboration with the Spanish National Research Council (CSIC) and the Andalusian Regional Government (JA); and the Andalusian Center for Molecular Biology and Regenerative Medicine, which is also sponsored, in addition to the JA and CSIC, by the Universidad de Sevilla.

There are 98 research groups, many of them focused on the field of Humanities, but also a part of them on Biotechnology and Biology, Health Sciences, Experimental, Environmental, Social, Economic and Legal Sciences, as well as in Information Technologies and Production and Construction.

These groups participate in numerous research projects. During the 2018-19 academic year, there were 20 international projects that they led or collaborated on (Universidad Pablo de Olavide. OTRI, 2019, p. 16). In fact, it is one of the universities in Spain that usually obtains the most R&D projects in proportion to the doctoral faculty number (Buela-Casal, Guillén-Riquelme, Díaz-Román, Carneiro-Barrera, & Quevedo-Blasco, 2019, p. 358).

Despite the great weight of Social Sciences and Humanities at the University, in 2018 the scientific production amounted to 657 papers, with an international collaboration rate of 42.47% and with a rate of articles published in first quartile journals of the Journal Citation Reports of 52.08% (Universidad Pablo de Olavide. Biblioteca/CRAI, 2020).

In research, the main lines of work are those of strengthening the presence of the University in the mixed research centers, as well as the improvement of the international collaboration of research groups and centers. In terms of human resources, it is proposed to implement actions of attraction and stabilization of talent. The transfer of research results and knowledge is another line of work which is trying to be prioritized through the creation of technology-based companies and the increase of collaboration with the close social and production environment (Universidad Pablo de Olavide, 2018).

Excellence and internationalization are the hallmarks of the institution. They are what aspires to strengthen it to become a benchmark at the national and international level. Both teaching and research do so by taking advantage of the agility of being a small institution. However, this is sometimes also a handicap, due to the lack of own resources that allow it to soundly deal with the circumstances that have arisen, such as budget cuts or the lack of flexibility for hiring staff and attracting talent.

There are currently two services which exclusively support research: The Research Results Transfer Office and the Research Area. In addition, in part, both the Teaching and Research Staff unit and the Learning and Research Resource Center (LRRC) have some services dedicated to this task.
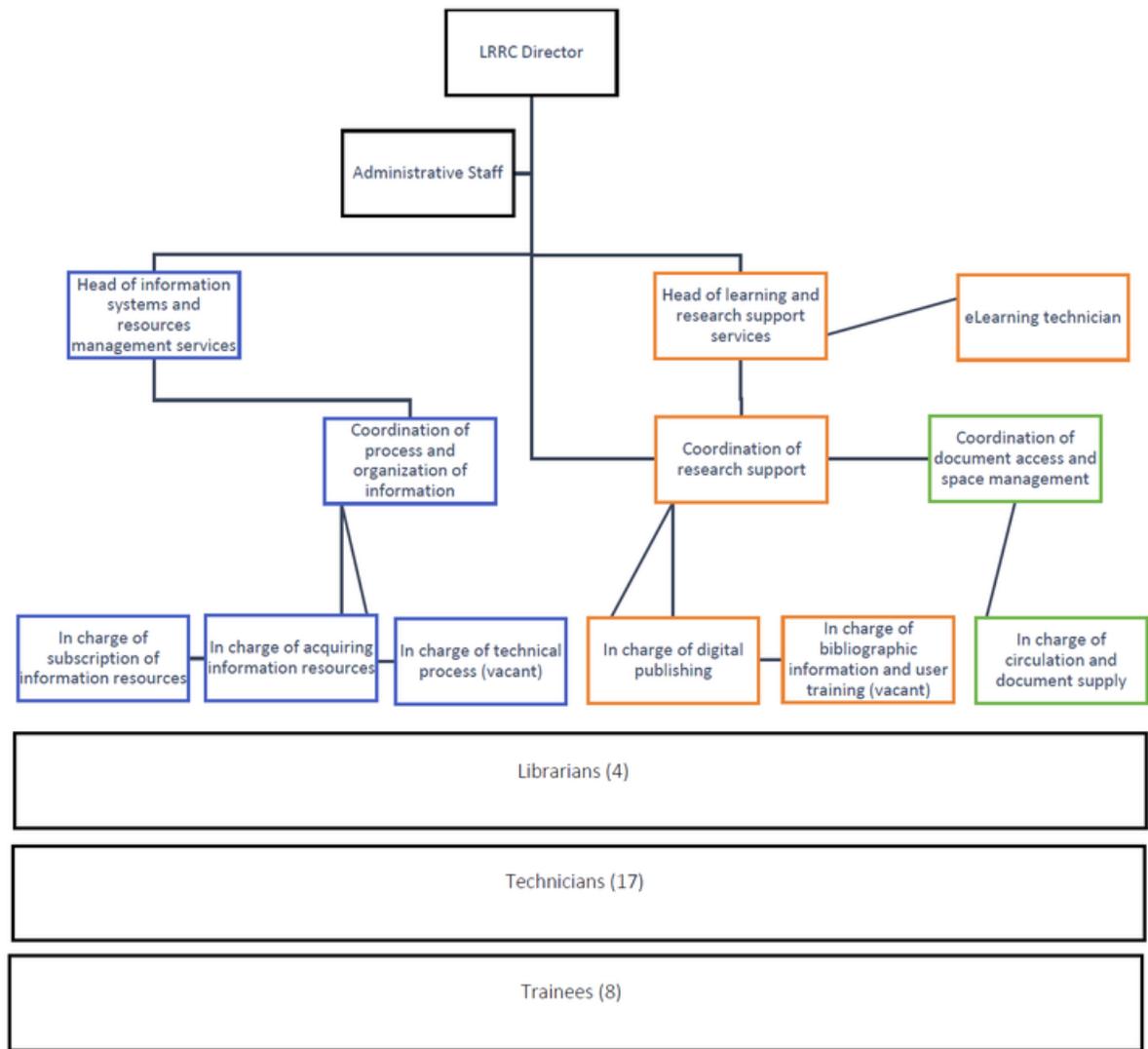
The Universidad Pablo de Olavide LRRC is the result of the aggregation of a number of services, facilities and staff to the university library, which has taken place in recent years. Its main mission is to provide quality information services to the entire university community as a support to study, teaching and research. The users it serves are mainly students, and the University's teaching and research staff, although all the facilities, collections and services are available, at least in part, to the general public.

This LRRC is part of the Consortium of Andalusian University Libraries (CBUA), which enables having an excellent collection of electronic resources that connect the collection with the analog media that has existed since its creation (Consorcio de Bibliotecas Universitarias de Andalucía (CBUA). Grupo de Trabajo de MAP y ERM, 2006; Duarte Barrionuevo, 2004). Currently, the collection consists of 548,682 monographs (70.04% electronic), 30,685 titles of electronic journals and 393 printed journals, 87 bibliographic databases, and a good number of open access resources that have been selected for their incorporation into this collection. In addition, this alliance has brought about a collective catalogue (González-Fernández-Villavicencio et al., 2005) which has been in use until recently, a loan system between these institutions (Chamorro Rodríguez, 2012), and even a collaboration in the acquisition of a library management system and discovery tool (del Pozo Redondo, 2019) and the implementation of the ORCID identifier for all its researchers (Cámara-Aroca et al., 2015).

The Service is centralized in a single building of 15,000 square meters. All the services, collections and facilities are located here. More than 10,000 are dedicated to the reading room. A large part of the analog collection is also arranged in the reading area. The rest of the building is divided between undergraduate rooms, teaching seminars, computer labs, group work rooms, collaboration spaces, a work area for librarians, offices, document warehouses and general warehouses. However, the building is located far from the center of the campus and the main area of classrooms and offices, which hinders its access. In addition, the building hosts the Campus of International Excellence, CEI Cambio, and the International University Center, which is responsible for the international students' exchange programs.

In total, the LRRC employs 41 people: librarians (14), technicians (17), administrative staff (1), an eLearning technician (1), and trainees (8), mainly distributed in three areas: collection management (including the acquisition, selection and processing of materials); access to documents and spaces (including services such as the loan of all kinds of materials and the use of facilities); and services (supporting learning and research, including audiovisual services). As the structure has been evolving very slowly in recent years, the organizational chart still has dysfunctions related, above all, with the lack of personnel to cover and make all the action areas visible (Figure 1).

Figure 1. The Universidad Pablo de Olavide LRRC Staff. (Source: the author)

THE RESEARCH SUPPORT SERVICES AT THE UNIVERSIDAD PABLO DE OLAVIDE LEARNING AND RESEARCH RESOURCE CENTER

As has been seen, there is a strong current within the scope of academic libraries to try to provide research support services. The objective is to meet the challenges inherent in the intensive use of digital technologies and the mass production of information in the scientific field. This is, moreover, driven largely by the increased pressure to position university institutions in an increasingly competitive and global environment.

Some big questions emerge in this context:

- What has been the implementation strategy of the Research Support Services at the LRRC of the Universidad Pablo de Olavide?
- What services are included?
- What resources does the LRRC have at its disposal to serve researchers?

Ten years ago, work began on a change that, through various avatars, has not yet been completed. At the heart of this change is user orientation as opposed to traditional orientation to information resources. The following describes this process of change in the case of attention to researchers, taking as an example the strategy of training in digital competence.

Mission, Services and Resources

The main goal of the Research Support Services of the Universidad Pablo de Olavide LRRC is to contribute to the improvement of the research processes that are carried out within the institution, as well as to maximize the results obtained and their dissemination.

Two services were created to achieve this goal: The Service of User Training and the Bibliographic Information Service, both through the former person Responsible for Information and User Training, who is since this year the Coordinator of Research Support. There are, therefore two separate services which, however, are, however, closely related. First, because they share a team: the person Responsible for Bibliographic Information and User Training, and now the Coordinator of Research Support, the librarians and the team of technicians are the same people for both services: the User Training Service and the Bibliographic Information Service, although both the librarian and the technicians have shared tasks in various procedures of other services. They also share a physical location in one of the areas of the LRRC building. However, the similarities go further. In the last few years, the synergies between the training of users, and the response to their information demands are linked by the willingness to always respond to their needs from the perspective of information skills.

Many authors have already made this relationship clear. In 2010, at the 76th IFLA Congress, Sheila Corrall held a presentation analyzing this relationship (Corrall, 2010) and reviewing previous works that affect the same relationship, such as those of Grassian & Kaplowitz (2001), Harding (2008) and Devlin (2008). These works emphasize the common approach to training in information literacy in both services. The presence of both services previously mentioned is, then, justified as being the same Responsibility. We now describe them.

As can be seen, the structure of the staffing template follows a classic scheme and is oriented toward the technical process and the use of information resources. It should be noted that, until recently, most librarians, technicians and trainees were engaged in these tasks. However, in recent years some changes have been taking place to try to change that orientation.

The first was the endowment of the person Responsible for Information and User Training position, non-existent until 2015. In this way, the training and reference tasks that were already being carried out were visible, while a structure project began to be carried out that is still under construction. With this premise, the second step was that a librarian began to perform tasks in the services of bibliographic information and user training. The third of the milestones was the specialization of the technical staff dealing with the reading room, the attention to users and the loan of materials. Thus, the technicians were divided into specialization groups: the monograph process, the process of periodicals and, finally, information and training, in which the technicians were integrated in an equal proportion. In this way,

together with the tasks that they usually carried out, they begin to take on new ones that are much more specialized, which are coordinated from different responsibilities: the Information and Training of Users; the Circulation and Document Supply; the Acquisitions of Information Resources; the Resources Subscription; and the Standardization and Technical Process. In the case of the user information and training group, its components are mainly dedicated to three task groups: that related to user training, mainly undergraduate students; that which has to do with responding to demands for basic information via telematics; and that framed in the library's communication strategy on social media. Finally, the training plan for trainees has been modified, so that they also spend part of their two-year training period learning how training and information tasks are carried out.

2020 has brought some important changes in terms of staff, since, on the one hand, it has allowed the incorporation of another librarian for these tasks and, on the other hand, the Coordination of Research Support has been created, which has been occupied by the previous person Responsible for Bibliographic Information and User Training, whose place has been left vacant. Thus, in addition to increasing the human resources available, the structure has continued to grow in order to accommodate other previously dispersed research support services and staff. However, the group of technicians continues for the time being with its specialization tasks that are much more oriented to learning and teaching support. As a result, research support services are currently provided by the Research Support Coordinator, the person Responsible for Digital Publishing, two librarians and, in training tasks, two trainees who take turns in their shifts.

Regarding services, those currently grouped under research support are:

- User training, including training for graduate students and teaching and research staff
- User information, which encompasses specialized (copyright and intellectual property, communication and scientific evaluation, digital academic identity, open access, etc.) and bibliographic information
- Digital publishing: open publishing of institutional scientific and academic journals, open publishing of scientific, academic and institutional production in repositories, and support for the holding of congresses, conferences and seminars

The User Training Service

As mentioned, this is answerable to the Head of Learning and Research Support Services. Its mission has been evolving to incorporate the view of supporting research services and digital competence. In 2005 the mission was "to facilitate and promote the training of members of the university community in the use of the services and information resources of the Library" (Universidad Pablo de Olavide. Biblioteca, 2005). Now, in the new document, the new mission includes facilitating and promoting the training of students and the teaching and research staff to develop digital competence and the use of the information resources, and topics related to the development of the communication, visibility and evaluation of the scientific production and the development of multimedia materials (Universidad Pablo de Olavide. Biblioteca/CRAI, 2019).

The User Training Service, as part of the services offered to the teaching and research staff and students of the University began to gestate in 2010. Until then, training was underdeveloped, notably because there were no staff specifically in charge of these tasks. Training actions had been carried out within the framework of some sporadic collaborations in undergraduate subjects and master and doctoral

programs; guided tours for new entry students; and face-to-face and online training offered by information resource providers directly, with their own staff. In any case, these actions were focused on the perspective of traditional bibliographic instruction and teaching on how to use the collection and library services, especially those which are analog and face-to-face.

At the beginning of the 2010-11 academic year, a more comprehensive training plan for researchers was started, including a series of courses on information resources by subjects and fields of interest, as well as the use of bibliographic reference management tools, specifically RefWorks. The main goal of these courses, beyond the obvious fact of training or recycling the attendees' knowledge, was to find out the degree of training and general interest of researchers regarding the use of the information resources available in the Library. At the same time, they were offered the opportunity to initiate collaboration for the delivery of these contents in their undergraduate, bachelor's or diploma courses and master's degree by the Library, logically focused on students. In addition to the specific training in scientific fields, in the same year took place the first support workshop for the submission of applications to obtain recognized six-year research periods (also known as *sexenios*), one of the main calls for evaluation of the research activity to which researchers from Spanish universities and research centers can (and in some way, must) periodically apply.

Since 1989, this has been evaluated by the National Commission for the Evaluation of Research Activity, created ad hoc as an independent body and now integrated into the National Agency for Quality Assessment in Higher Education (ANECA). This Commission annually publishes the criteria to be met by the contributions (5, in general), which must be presented in the application for the different fields and subfields into which the distinct areas of knowledge are grouped. However, the passing of the Royal Decree-Law No. 14/2012, of April 20, on urgent measures to rationalize public spending in education, introduced the possibility of using obtained *sexenios* as a scale to modulate the teaching load of academic staff and, further, in some universities, as an essential requirement to, for example, direct theses, be in tribunals, or even for tenure. This fact marked a milestone because it meant having to deal with, since then, dozens of researchers who want to participate in this call and need very specialized advice.

As a result of this intense work, the number of applications for collaboration in different subjects grew exponentially in the following academic courses. This peaked in the 2012-13 academic year, in which more than 300 face-to-face hours of training were taught.

In parallel, in the 2011-12 academic year, an offer of training was made for postgraduate degrees, including official master degrees and doctoral programs. This offer, which included a program with at least ten hours of face-to-face training per program, was also very well received, attaining almost 50% of the titles from the first year. Since the 2012-13 academic year, a specific training offer was also held for teaching and research staff training, which replaced the previous unique and fundamental one offered by the Library which, on the other hand, was based on competences and managed in collaboration with the Teaching and Research Staff Training Unit. This new catalogue includes, in addition to information skills, computer skills linked to research and competences in scholarly communication, including those related to the evaluation of research activity. In the 2013-14 academic year, we worked on the redesigning of the entire training offer, with new proposals that were launched in the 2014-15 academic year, based on another of the objectives attained: to achieve the presence of the Computer and Information Competences (CI2) in the Strategic Plan of the Universidad Pablo de Olavide 2014-2016 (Universidad Pablo de Olavide, 2013). Since 2015, different plans have been undertaken with the aim of systematizing the activities carried out in both services and with the inflows of the daily activities of other staff serving the Library.

There is no doubt that the dedication of the specialization group to the tasks of user training was a spur to the offer that was being carried out, since it allowed generalizing it at the degree level, while enabling the release of resources to devote them to postgraduate studies and research. During the 2017-18 academic year, the transformation of this training program from the conceptual framework of Computer and Information Competences, CI2, to the European Framework for Digital Competence, DigComp, was launched. The results of implementing the framework change and the training actions designed from this change were presented in poster form to REBIUN's 17th Workshop of Digital Projects: Connecting technologies, linking content, innovating services (Delgado-Vázquez, 2018).

In the case of master students, there is also the possibility of doing the training offered by the Library that is carried out in collaboration with the academic staff in charge of this degree. Similarly, at the doctoral level, there is also a systematic and annual offer for all programs that includes not only digital competence, as in previous cases, but also those related to scientific communication. The teaching and research staff and the administration and services personnel are served by training sessions given by the Library together with the Multimedia Lab and the support of the Teaching and Research Staff Training Unit. Of all the training offers listed above, the one that is clearly defined as research support is that which is carried out for both researchers and PhD students.

Training at the doctoral level has been given for more than a decade (Delgado-Vázquez, 2015) and was systematized a few years ago through a common offer offered annually to the commissions of all doctoral programs. Beyond the obvious interest of the applicants in obtaining the degree of doctor, who then starts a serious research career, being trained in all the details related to the competences in information and scholarly communication, this offer responds to the requirements established in Article 5 of the Royal Decree 99/2011, of January 28, which regulates the official doctoral studies, including the competencies that must be acquired by candidates (España. Ministerio de Educación, 2011).

In the same way, the National Plan for Scientific and Technical Research and Innovation 2017-2020 (Gobierno de España, 2017), related to aid convened in the State R&D 2017-2020 training subprogram for pre-doctoral training, includes the following paragraph:

The design of the convocation resolutions will take into account and incorporate the present and future needs of the main institutions, companies and R&D&I agents, also incorporating aspects necessary to promote both international and institutional mobility; attracting young foreign researchers, including those linked to bilateral and multilateral scientifically collaborative agreements; the participation of doctors in training in research projects (national and European) and the acquisition of digital skills and skills necessary to apply the principles of open access to results and data from publicly (p. 45).

Beyond the generic references, the provision of training in information skills for PhD students was, as has already been said, endorsed through its inclusion in the Strategic Plan 2014-2016, within Strategic Line 1.4: Strengthen external *practices and skills training, Action 1.4.3. Integration of computer and information skills in undergraduate and postgraduate studies* (Universidad Pablo de Olavide, 2013).

The main goal is to respond to the demand by the academic commissions of the doctoral programs to include digital competence and scholarly communication in these degrees. However, only 4 of the 9 programs request this collaboration each year, while the others do so sporadically (Table 1). This is a face-to-face training program of 15 eminently practical hours in which the aim is to give a global introduction to the world of research from the perspective of scientific documentation. Most of the materials

Table 1. Training provided in doctoral programs per academic year (Data source: Universidad Pablo de Olavide. Biblioteca, 2003-)

Program/Year	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Business Administration and Management				X					
Biotechnology, Engineering and Chemical Technology			X	X	X	X	X	X	X
Law and Politics					X	X			
Social Sciences				X	X	X	X	X	X
Physical Activity and Sport Sciences									
Migration studies					X	X	X	X	X
History and Humanities: Europe, America, Arts and Language				X	X	X			
Society and Environment	X	X	X	X	X	X	X	X	X
Neuroscience									

have been developed using *LibGuides*, a web content manager specialized in Libraries for the design of information guides (on services, facilities, etc.), thematic guides and training materials.

The content is deployed around five units based on information literacy and scientific communication:

- Doctoral theses and digital competence: national and university regulations on the elaboration of doctoral theses, their deposit in open access, an international mention, the professional career at Spanish universities, the evaluation and accreditation systems
- Scientific information: the process of production, editing and distribution of scientific information: quality guarantees, documentary types and search tools
- General and specialized information resources, coverage and advanced use: advanced search methods, search equations, use of documentary languages, criteria for evaluation of scientific information, bibliometric tools and their applications, creation of summary and search alerts
- Working with the information: writing abstracts, tabs and annotations, management, creation and online publication of documents, writing of papers and reports, intellectual property, copyright, citations and bibliographic references, reference managers
- Publication and dissemination of works: standardization of author names, digital academic identity, scientific social networks, self-archiving and open access, impact evaluation with traditional and alternative metrics

From the 2015-16 academic year, those attending these training courses voluntarily have completed a satisfaction survey in which they have evaluated various aspects of the sessions. The content, duration, methodology, the usefulness of the course and the knowledge of the trainer have been subject to their scrutiny. The degree of general satisfaction has been above 4 out of 5 on average each year and in each edition.

As mentioned, the other major area of activity of the User Training Service in terms of research support is the training of the teaching and research staff. This training means to respond to the demand by the teaching and research staff of the University to improve their skills and knowledge in topics related

to the search, access and use of information; the communication and visibility of their publications; scientific assessment based on bibliometric indicators; designing multimedia materials; and the use of computer tools for information management and improvement in the performance of their teaching and research activities. These are training actions that, at least since 2010, have been part of the LRRC's own offer in collaboration with the Teaching and Research Staff Training Unit. This Unit is responsible for including the LRRC's training proposals in the teaching and research staff Training Plan for each year and in the calendar. According to the dates, the Teaching and Research Staff Training Unit also takes over the reservation of spaces (physical or virtual), makes calls, selects the attendees and, finally, certifies the attendance/passing of the course after the fulfillment of the requirements. For its part, the User Training Service is assigned for the tasks of the planning of the training offer, the design of materials, and the delivery of the training actions.

Regarding the content of the training sessions, this is once again a question of emphasizing the skills and technologies related to scientific research processes and scholarly communication, including everything regarding research planning, its management, publication, dissemination and evaluation (Table 2). Sessions related to bibliographic reference managers, digital notebooks, software for collaborative work, and the use of information resources, such as databases, journal and ebook portals by topic areas. In addition, courses are also organized to support the processes of the evaluation and progress of academic careers at Spanish universities. In terms of the dissemination of research, sessions on academic profiles, academic search engine optimization and the standardization of author names, open access and repositories are included.

*Table 2. Training Topic by Research Step Examples. (Source: the author)*

Research Step	Training Topic
Planning	Information and Data Searching
Management	Reference Management Software
	Online and Collaborative Word Processors
	Digital Notebooks
	Cloud Tools for Collaborative Work
Publishing	Open Access and Repositories
	Copyright and Intellectual Property
	Journal Selection
Dissemination	Social Media for Academic Purposes
	Author IDs & Profiles
	Slide Presentation Tools
Evaluation	Bibliometric Indicators and Tools
	Research Activity Evaluation and Accreditation Processes

These are in most cases two to three-hour face-to-face sessions, although some of them have begun to rely on the University's virtual teaching platform. This platform uploads all materials for the course and a Q&A forum is opened, so that many of the queries that were previously made to the LRRC on

this subject are now channeled through the specific classroom created in the platform. Some sessions have begun to be taught through the video conferencing tool *BlackBoard Collaborate Ultra*. Such is the case of courses on the accreditation of research activity (*sexenios*) or updates on the use of the discovery tool, *Eureka*.

This type also includes the training sessions offered by different information resource providers. Most of them offer both face-to-face and online sessions that are disseminated and offered to researchers. These are organized through the CBUA Electronic Resources Group. They are intended for both researchers and library staff. In all cases these sessions are always coordinated and evaluated by the Library. Figure 2 provides an overview of the main data concerning the training of researchers.

Figure 2. Training for researchers, main data (Data source: Universidad Pablo de Olavide. Biblioteca, 2003-)
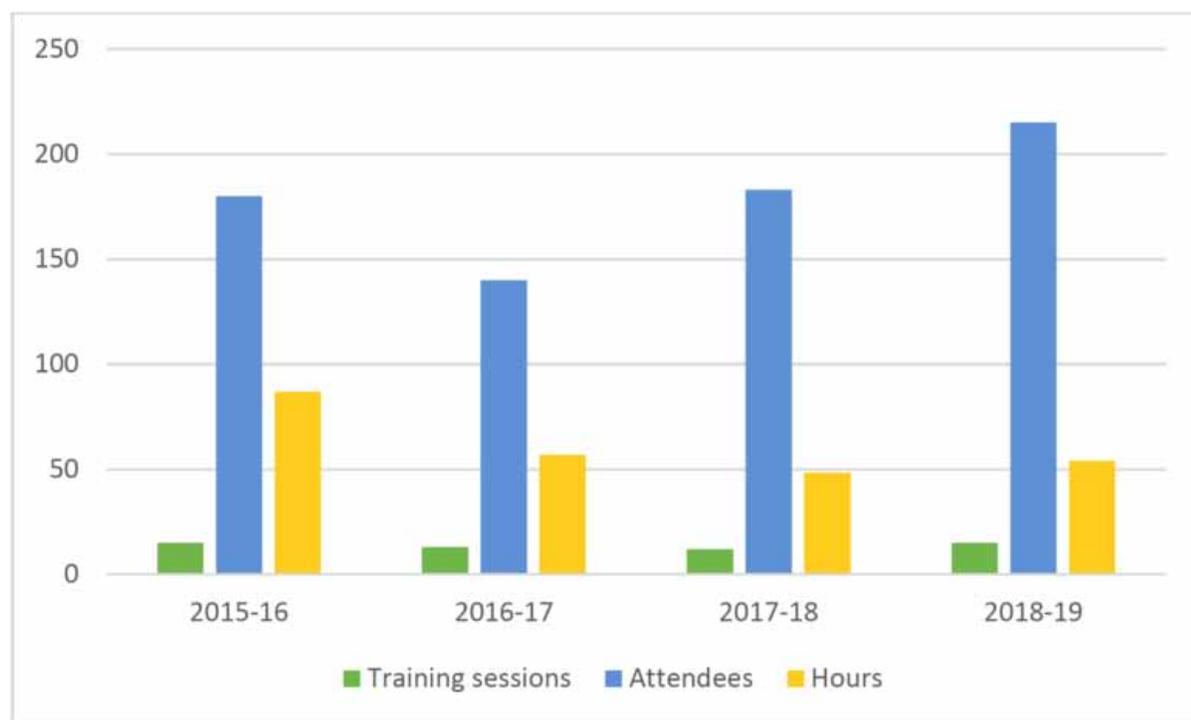
As in the case of doctoral students, researchers who have attended these training sessions have also filled out the corresponding satisfaction survey. In it they have evaluated the interest of the subject, the development of the sessions, the materials handed out, etc. In this case, the evaluation has also usually been higher than 4 points out of 5 on average.

Bibliographic Information and Reference Service

The main goal of this service is to handle requests for information received by the LRRC. These requests can occur in different ways (in person, by email, contact forms, by telephone, social networks, and so on) and can be answered synchronously or asynchronously. The procedure covers general information related to the LRRC (opening hours, location, services, available information resources) and specialized information, which is obtained from proven quality information sources. In the scope of the Service is the university community and, in the case of basic information, society as a whole. Since the staff involved in the Information Service are also involved in the User Training Service, many of the information demands originate from prior training. In-person and telephone demands are managed directly at the loan/information desks by technical staff. The resolving of these demands usually involves any of the technicians who normally provide service at the desks, although, increasingly, and when the type of information requires it, these technicians are responsible for meeting these demands.

The technicians also have several jobs in the internal work area, together with the librarian who also carries out her work in Information and Training and the person Responsible for Information and User Training.

The topic of these requests for information is commonly related to the opening and closing times of facilities, location and access of documents, loan rules, sanctions, library services, available information resources, general information searches using multidisciplinary tools, environmental conditions of the building, and so forth. Technicians have been trained to resolve basic information demands. In addition, those who belong to the Information/Training Group have received more hours of training and get daily information on all these topics, as well as how to resolve the demands for information. However, many of the requests for information require more specialized knowledge and are usually sent to the internal work area of the LRRC, where they are dealt with by the Coordinator of Research Support or the librarians. These demands for specialized information have been growing in recent years, both in the number and in the thematic dispersion and complexity of their solution. Thus, in the first instance, demands were resolved on the advanced use of certain information resources, as well as requests for information searches and references.

Over time, the type of applications has varied in terms of their topic and, these days, they are more related to scholarly communications, evaluations of research curricular and other topics to do with research processes. The Information Service resolves inquiries regarding intellectual property and copyright, self-publishing, the selection of journals for publication, the location of quality and bibliometric indicators, evaluation and accreditation processes, the writing of academic papers, techniques and tools to increase visibility (scientific production profiles, repositories, social networks, scientific dissemination), both individually and from groups of researchers and/or journals staff, etc.. Yet there are also others concerned with information management: bibliographic reference managers, content managers, digital notebooks, data management, etc.; and of course, those to do with searching for information in the broader sense of the concept from very basic questions about how to examine information resources (databases, for instance), to the location and selection of sources of information specialized in very specific topics, through the elaboration and correction of search strategies, the creation of alerts, and so on.

Both specific questions and queries that require the preparation of some type of report are answered. Applications are also reviewed and corrected for the various accreditation and evaluation processes. This type of consultation consumes a greater part of the resources and, due to the depth and complexity of the queries, many of them end up with one or more face-to-face appointments, individually or in groups,

in which the main topics are covered. In this sense, since the Service began advising the accreditation calls of the faculty of the Academia program for associate lecturers and lecturers (ANECA), the PEP program for associate lecturers (tenure track) and lecturers, (ANECA and the Andalusian Regional Agency for Quality Assessment in Higher Education, DEVA) and *sexenios*. However, there have recently been many consultations related to other evaluation processes and funding calls from Regional, National and European Funding programs. Finally, consultations from other areas and services of the University are also answered and resolved, as well as from sole-member and collegiate bodies, usually related to intellectual property, visibility, publication and scientific evaluation.

The year 2018 was a landmark in what attention to researchers implies due to the call of the Knowledge Transfer and Innovation *Sexenios* (Delgado-Vázquez, 2019). With the leadership of the LRRC (in permanent communication with the Vice-Chancellors of Academic Staff and Research and Technology Transfer, and with the Research Area) a number of applications were processed, not without problems since it was the first call of its kind at the national level, which accommodated all scientific disciplines and that could be presented by any academic staff who already had a *sexenio* granted and this was, therefore, a relatively new topic, given that the call was only known a few days earlier and the criteria were outlined during the application period. Without reference documentation and having no similar processes to rely on, this has been a real challenge whose results should begin to be seen in a few months. It should not be forgotten that in addition to the extraordinary call, applicants for the ordinary call were also served, as every year. No records are kept of this synchronous attention that provide us with information about the number of queries, typology, user satisfaction, etc., beyond those that have to do, as has been said, with the request of appointment by the user in the case of specialized queries. However, data is collected from the queries that arrive through digital media. This information pathway has also experienced remarkable growth in recent times. Thus, since its launch in 2008, the number of requests for information has continued to grow, year by year (Figure 3).

Figure 3. Number of queries through Infobib, per academic year (Data source: Universidad Pablo de Olavide. Biblioteca, 2003-)
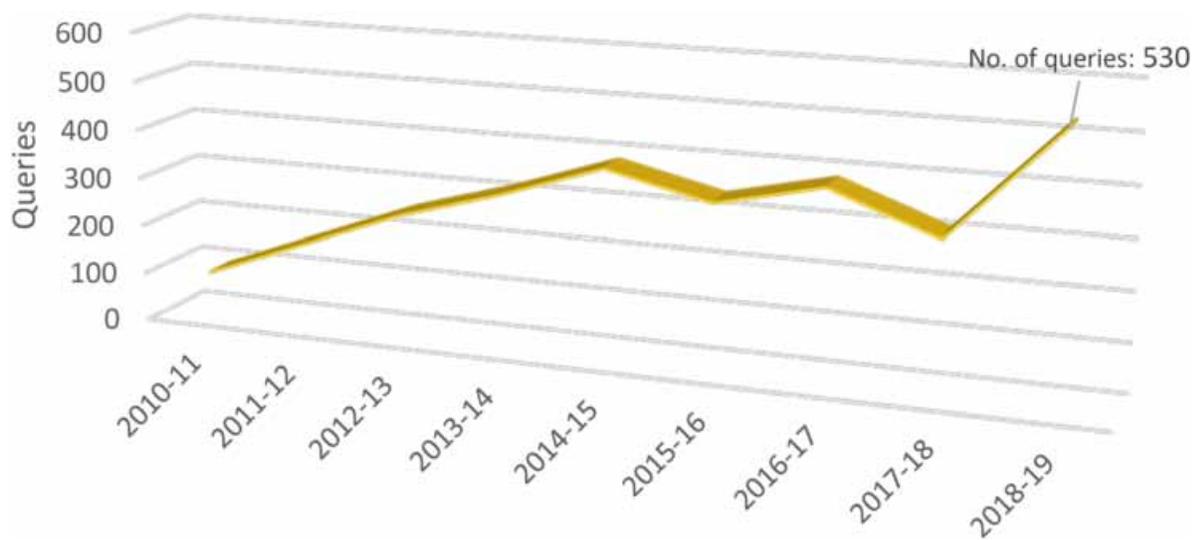
In the case of an asynchronous response service, that is, by definition it allows the users to make their demands for information at any time, regardless of the hours of service and the availability of personnel, an important aspect to take into account is that of response times. This is an aspect which the Service places special emphasis on, since it is understood that many of the questions raised by users need a quick response as they interfere in the development of their research, learning, teaching and management, as the case may be. Thus, in recent years these response times have been gradually decreasing to an optimal percentage of immediate response. As far as the topic of consultations is concerned, it does not really differ too much from the topics demanded in face-to-face and telephone consultations, both at the basic and specialized levels. Figure 4 shows the main topics of the queries for the 2018-19 academic year, the last for which we have complete data.

Figure 4. Main topic of queries through Infobib (Data source: Universidad Pablo de Olavide. Biblioteca, 2003-)
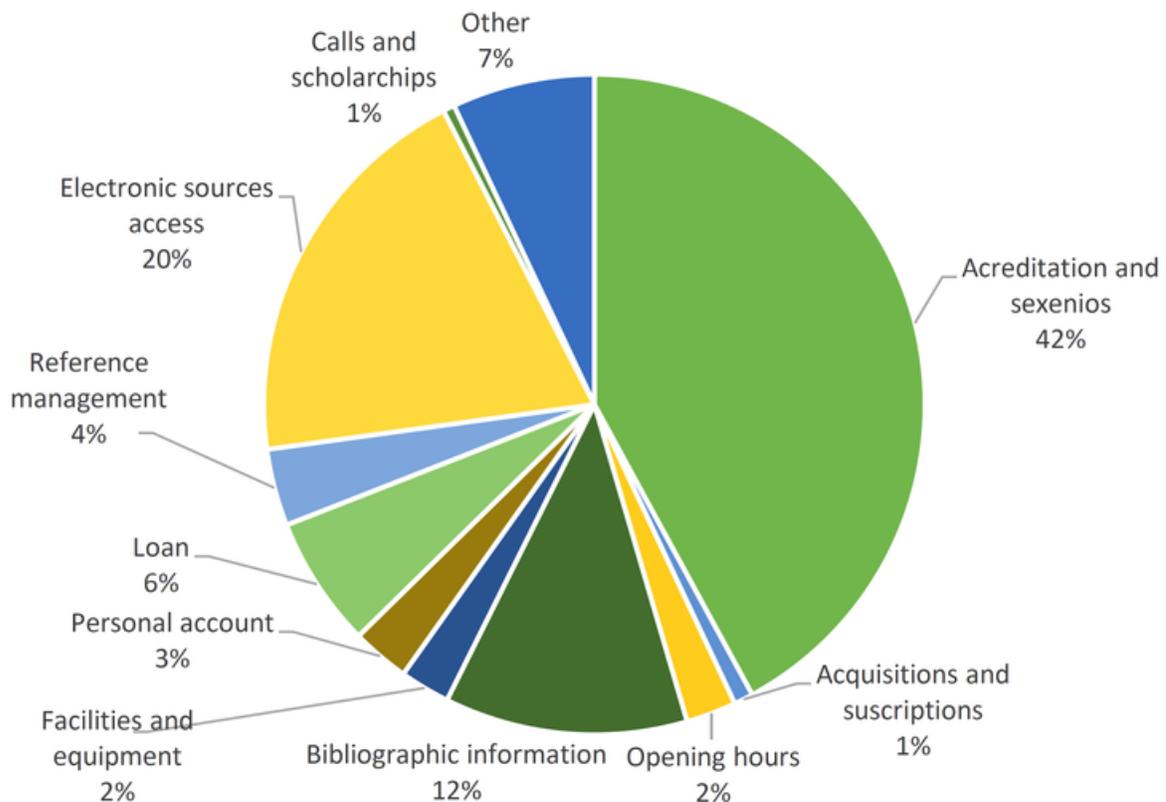
Specialized queries are coded in Accreditation and *Sexenios*, Bibliographic Information, Reference Managers and Electronic Resources. Thus, during the last course these accumulated 76% of the consultations.

Regarding the type of user using this Service, the data are presented, again based on the 2018-19 academic year, divided by groups: undergraduate and master students; researchers and PhDs; administrative staff; and external users (Figure 5).

Figure 5. User Typology of Infobib (Data source: Universidad Pablo de Olavide. Biblioteca, 2003-)
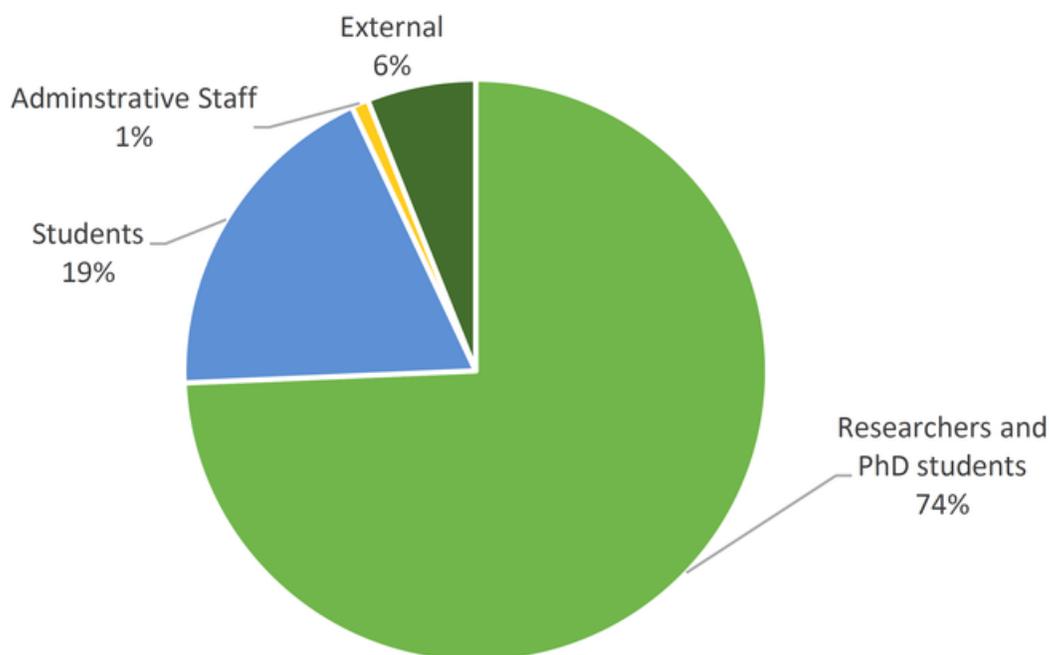
As can be inferred from the last two graphs, the researchers and the topics related to the processes of production, communication and scientific evaluation are the ones which contain most of the resources dedicated to providing this Service.

Users of this service were not invited to make their assessment until 2017. After that date, an online survey has been available asking them about their level of satisfaction with the response and the service. Measured out of 5, all items have been on average close to the maximum score.

Another highlight is the creation of guides and tutorials as support elements for autonomous information and self-learning by users in general and, especially, researchers. In this sense, since 2017 work has been carried out on the implementation of a portal dedicated to hosting three types of content: thematic guides, resource guides and subject guides. The software chosen was *LibGuides* which, as has already been explained, is a web content manager specialized in serving libraries and has a very wide implementation at a global level, particularly in the field of university libraries. The portal "Guías y tutoriales de la Biblioteca/CRAI de la Universidad Pablo de Olavide"[3] presents, firstly, the visualization of all the available content. There are two complementary classifications or visualizations: by subject, based on thematic descriptors extracted from the UNESCO Thesaurus; and by type, which uses the native *LibGuides* classification to divide the guides into:

- General Purpose: contains the guides for the use of the information resources subscribed to and/or selected by the Library, as well as tools for managing bibliographic information.
- Subjects Guides: these are materials designed to guide researchers and students from the perspective of the use of information and focused on a disciplinary perspective.
- Theme Guides. These are materials aimed at compiling information, tools and materials around a topic, usually related to research, or a service provided from the Library. Thus, in this section, 13

guides are currently published on topics such as Open Access, APCs, Standardization of Author Names in Scientific Publications, ORCID and *Sexenios*. These guides have a freer format than the previous ones since they are very conditioned by the subject that they are dealing with.

The guides incorporate both textual and multimedia material, including graphics, videos, infographics and, of course, links to reference material

As explained above, *LibGuides* is also being used to develop guides as teaching material for user training, both undergraduate, master and doctoral students, as well as researchers and administrative staff. These are public access guides that, however, are hidden, so access to them is conditioned by the knowledge of the URL of each of them. One of the main features of this type of guide is to have a very pedagogical approach. Thus, the design of each of them is conditioned by the contents included in the training programs of the different levels. Likewise, the content of each of them is highly conditioned by the establishment of learning itineraries and balanced in depth and in load by the amount of content in each course level in which they are included.

LibGuides provides enough flexibility to be able to reuse in courses of different levels not a complete guide, but small fragments of them, which saves a lot of effort, considering that changes in the copy object guide can be automatically reflected in each of the copies that are made (this also applies to the other types of guides). Another forte of this system is being able to embed content from other sources. For training, this is being used not only to integrate training content as such, but also to include tutorials, demonstrations, exercises and self-assessment questionnaires from different sources. The most obvious examples of this are *Google Forms* quizzes and *Educaplay* (2020).

Finally, the latest component of the Library/CRAI Guides and Tutorials portal is a directory of scientific-technical information resources, which is the complement to all the above. This is a database in which each entry corresponds to a different resource, which can be described identifying its main characteristics: title, producer, subject, chronological and linguistic coverage, documentary typology, volume of records, etc. In addition, the URL access has, logically, been incorporated, as well as the link to the corresponding user guide, hosted in the portal of Guides and Tutorials, as already explained. The resources included in this directory come from the LRRC collection or have been selected by the staff of the Bibliographic Information and User Training Services. All the content included in the portal is harvested from Eureka, the discovery tool of the LRRC.

Finally, the Digital Publishing Service has recently been incorporated into the structure of the Research Support Services, so that, to date, it has remained outside the working strategy followed in the services described above.

FUTURE RESEARCH DIRECTIONS

Academic libraries are now a key part of university research support. The multitude of services which they offer are indispensable not only for the creation of knowledge, but also for its dissemination, evaluation and reuse.

However, as we are currently immersed in a state of constant evolution the transformation cannot stop. Right now there are several challenges that academic libraries must face that will affect all their services and functions across the board: research projects and data management (Féret & Cros, 2019; Tenopir, Kaufman, Sandusky, & Pollock, 2019); the implementation of the policies inherent in PlanS,

at least in the European context (cOAlition S, 2019) and the expected change of model in the scientific evaluation with the implementation of the San Francisco Declaration on Research Assessment (ASCB, 2012) and the Leiden Manifesto (Hicks, Wouters, Waltman, de Rijcke, & Rafols, 2015).

Libraries must be prepared to train their users and to ensure that they are able to perform adequately in this context.

CONCLUSION

Digital tools and techniques have a key role in all research processes. Libraries have been working to help researchers for decades. To this end, they have carried out substantial transformations in some of the traditional services that they already provided, while generating new ones to respond to both these changes and the demands of researchers.

In the case of the Universidad Pablo de Olavide, its LRRC has been working for almost a decade to bring about this change. In this case, research support services have been designed that previously did not exist or were provided in an isolated manner. Thus, bibliographical information and references, as well as user training, were practically testimonial. In these years, both services have grown hand in hand, allowing the LRRC to be placed once again on the agenda of researchers, as well as academic staff and students.

One of the main issues has been the transmission of digital competence, in alignment with what is being promoted by different national and international organizations. To this end, training programs have been transformed to accommodate a broader approach, going beyond the classic training of library users.

Despite having managed to place these issues in the University's strategic plans, the economic situation and a certain lack of interest in the decision-making bodies have minimized the potential impact of these initiatives. This can be seen, for example, in the insufficient development of human resources. Although these have undergone some substantial changes in the distribution of functions, proving a certain shift in the mindset of the librarians themselves, the LRRC has remained at the same level of staffing since this transformation began. This is undoubtedly a weakness, as many of the projects launched are supported by meagre resources which at any moment can be allocated to other tasks or not be available at all.

Nevertheless, user satisfaction statistics seem to indicate that the LRRC is indeed increasingly valued by researchers and that its services are undeniably meeting their expectations.

The Universidad Pablo de Olavide LRRC means to take the steps to continue providing research support services in line with the new challenges and needs of researchers. Yet, thorough transformations must be carried out and this involves changing even the vision that its employees have of the service itself.

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KEY TERMS AND DEFINITIONS

Digital Competence: Digital competence involves the confident and critical use of electronic media for work, leisure, and communication. These competencies are related to logical and critical thinking, high-level information management skills, and well-developed communication skills.

Digital Scholarship: Is the use of digital evidence and method, digital authoring, digital publishing, digital curation and preservation, and digital use and reuse of scholarship.

Learning and Research Resource Centers: Is a dynamic environment that accommodates all IT and information facilities, resources and services that support learning, teaching and research within higher education institutions.

Research Assessment: A set of procedures aimed to measure the performance and quality of scientific research processes, affecting both the researchers themselves and the institutions in which they work. Research assessment embraces both qualitative and quantitative methodologies, including the application of bibliometric indicators and mapping, and peer review.

Research Support Services: A set of services, tools and facilities that aim to facilitate research tasks.

Research Training: Actions aimed at training researchers.

Scholarly Communication: The authoring, publishing, stewardship, and use of scholarship.

ENDNOTES

[1] CRUE stands for Conferencia de Rectores de las Universidades Españolas, now known as Crue Universidades Españolas. Rebiun stands for Red de Bibliotecas Universitarias Españolas (REBIUN) as the sectorial commission on library cooperation of Crue Universidades Españolas.

[2] CI2 is the acronym for computer and information competences, which for years has been used by Spanish university libraries as the identifying mark of the training programmes for users in these competences.

[3] The LibGuides portal "Guías y tutoriales de la Biblioteca/CRAI de la Universidad Pablo de Olavide" can be accessed in https://guiasbib.upo.es