



# Connecting New Trends and New Skills for Academic Librarians

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**Abstract.** Guiding documents of professional associations are revealing the main future trends around the globe in information science. This study seeks to systematize and identify the skills expressed in them and aimed at information professionals. Thus, the content of the guiding documents is analyzed to find the trends for the area, systematizing them in areas of interest. The skills needed by the professionals that emanate from it are identified. In addition, a survey of future professionals (graduate students) is carried out to try to understand what skills are valued in the future performance of their profession. It is noted that it is important to be aware of current trends and recommendations for the sector. Therefore, the preparation of students in information science for the prospects for the future will be more appropriate and meaningful, bringing benefits to themselves and to the academic communities in which they operate, if future librarians in higher education become aware of a changing world in which they will have to act.

**Keywords:** Information skills · Higher education · Librarians · Professional skills

## 1 Introduction

Recently, librarians' associations around the world have been reflecting on the professional development of their members. At the same time, researchers and practitioners seek to think and act following the contextual evolution of the profession [1–3]. Growing and diversified information to manage, submerging technologies that need to be mastered, spaces that take on new roles, the growing context of open science, the systematic evaluation of research and bibliometrics, and the multiplicity of requests from users who call for updating their information literacy, require new and updated skills from these professionals. In higher education institutions, whose social mission is to educate future generations, create knowledge, and ensure innovation in all subject areas of the public sphere, meeting emerging trends is imperative. This paper reflects on the current context regarding the competencies of the librarian, specifically those who work in higher education, trying to demonstrate how these competencies should be a response to the new trends. This is verified in the guiding documents of national professional associations [4] and international relevant institutions [5] consolidating and strengthening the daily

professional practices. I added current published studies to the key guidance documents to identify the skills required of information professionals are collected in the key guidance documents and. I clarified the main areas, creating action clusters, proposing an articulation of these with the learning, teaching, and research needs to design a skills map for future librarians. This map can be used in training skilled librarians through being aware of current trends and recommendations for the area. I then administered a questionnaire survey to students in library and information sciences (LIS) to assess their perception of the librarian's new roles and competencies. The results should be motivating factors for academic institutions in their commitment to providing conditions for the continuing education of information professionals, but also for the professionals who are already in the field who must permanently seek their updating.

To this end, I present a two-step investigation. In the first stage, I carried out an exploratory survey of the strategic references emanating from professional associations and national and international organizations related to information professionals. The criteria for choosing the documents to be analyzed were the timeliness and its strategic vocation, that is if they are current and include the explanation of trends in information science. The content analysis of each of the documents made it possible to list a set of skills that professionals must master. In a second stage, I distributed a survey to LIS students undergoing training to become future librarians to understand their perceptions regarding the skills to be developed.

## **2 Future Trends and Future Skills in Academic Libraries**

### **2.1 Needed Skills for Librarians**

Several studies on innovation in academic libraries have already been carried out [6–9]. They all converge on a central idea: the academic librarian's role is fundamental to change and innovation. Whether it is about studies focused on technology and its impact on libraries, organizational structure, or leadership, the key to understanding innovation lies in the vision held by the main actor - the librarian. Academic librarians should, therefore, be encouraged to understand this changing environment as an additional challenge, prepare to face conditions as opportunities for improvement, and assume their central role in this process. To this end, it is important that librarians invest significantly in developing and adapting their professional skills.

The meaning of competence [10] can vary in different contexts and generally refers to the quality of a person's mental or physical abilities. In the professional field, competence is related to a certain ability to do a job, to be successful, to actively participate in actions or processes, or even to interact properly with other people in different contexts.

Librarians' skills have been widely discussed in the professional literature. In Portugal, where there is no formal updating of professional requirements, the guidelines of the defunct European Council of Information Associations [11] continue to prevail, whose Portuguese translation was published in 2005 by the the Portuguese Association for Information Management (Incite). In this guiding document, the five groups of competencies and skills of European information-documentation professionals were formulated:

- Information: basic knowledge of the professional relating to the information documentation;
- Technology: skills related to computer and internet technologies;
- Communication: skills related to interlocution and internal and external communication;
- Management: skills related to budget, project marketing, human resources, training, and pedagogical actions;
- Other Knowledge (specificities).

Twenty main skills were also listed, mentioned as dispositions of spirit, grouped under the following topics: relationship, research, analysis, communication, management, and organization. This document, although dated, remains quite comprehensive, demonstrating that the dynamic environments of libraries does not prevent a certain continuity of required characteristics, as long as adaptation to new and demanding responsibilities is listed as one of these characteristics. In a recent study [12], resuming the international debate around the new skills of the information professional, an intense reconfiguration of the profession has emerged. The idea of the relationship between public and European policies is reinforced given the options and models of teaching existing in universities that train these professionals.

Some years ago, another study reflected on these characteristics [13]. Approximately two hundred job advertisements for the area were analyzed for their employability requirements. Qualifications and skills, were identified and serialized. The most significant areas mentioned by potential employers were certification in information science, work experience, followed by skills in communication, organization, collection management, and teamwork. In addition, competencies were mentioned in the area of user training and the area of digital content management. Also, in 2009, in an observation made in New Delhi [14], academic librarians were asked about their perception of the most relevant competencies for the profession. The competency they identified as the most important was communication, followed by competence with technologies. Management, organization, research, marketing, and negotiation skills were also indicated. Later, some investigations began to focus on the impact of the digital age on the reconfiguration of the skills of information professionals, identifying the contextual changes that demonstrate a more direct impact on the performance of librarians [15, 16]. These works stand out as responses to changes in higher education, technological developments, the nature of academic communication, user obligations and legal issues, along with changes in spaces or the need for collaborative work. In a panoramic and in-depth investigation [17], the study on the skills of librarians is systematized, focusing on more piecemeal works that, in turn, focus on the classifying librarians' skills according to the areas they work in and the roles they assume (management, collections, technologies, reference, among others), proposing, in several cases, a descriptive professional profile.

In 2016, three documents presented partial profiles for information specialists working in academic libraries. The documents issued by the Joint Task Force on Competencies for Librarians in Support of Research and Academic Communication disseminated competency profiles that professionals must develop: from sources management to support new functions, specifically in the areas of academic communication and research in the digital age. Explicit in their general objectives, these profiles will enable library

managers to identify skill gaps in their institution, form the basis of job descriptions, enable professionals to carry out self-assessments, and act as a foundation for the development of training programs for librarians and library professionals. This Task Force brought together representatives from the Research Library Association (RLA), the Canadian Research Library Association (CARL), the European Research Library Association (LIBER), and the Confederation of Open Access Repositories (COAR). In these documents [18–20], it was shown that libraries are at the forefront of digital transformation and digital information infrastructures, in addition to taking on the management and curation of collections and cultural heritage and, therefore, support for research and digital communication. Data management was also included, a task that requires a high level of interaction with researchers and also promotes interaction with other support services, including technicians. Finally, the profiles affirm the library activities that fit into academic publishing services such as open access repository services; advice on copyright and open access; and evaluation of academic resources.

A 2018 study collates the needs of researchers in the field of digital humanities with the profile of the open digital librarian based precisely on the digital ecosystem in which both professionals move, including access platforms, digital files, databases [21]. Both have to know how to handle information and be up to date in areas such as Big data, scientific data, routing, website management, database building, social networks, dissemination, publication, collaborative work, and issues of copyright. In the path of professional updating and preparation for a profession, an investigation points out nine domains of personal competencies that are most relevant to information professionals, namely:

- critical thinking;
- creative thinking;
- interaction & relationship;
- leadership;
- presentation skills;
- media literacy;
- cultural sensitive/intelligence
- effective listener;
- and negotiation skills [22].

These were determined based on the literature on communication and personal skills.

It can be seen, therefore, that given the objectives of academic libraries, libraries continue their mission by updating their roles through their changing context. The evolution of the academic library mission can be seen when looking at the new roles currently played by its librarians. These librarians may be editor of digital academic content; designer of online publications; scientific data librarian; web content specialist; digital preservation librarian; digital humanities librarian; digital repository manager; data visualization coordinator. Therefore, the list of roles involved in supporting digital scopes increases the range of performance of these professionals as they seek to respond to the challenges presented by their users - students, teachers, and researchers [23]. In summary, the analyzed literature reveals an evolution of the profile required of academic librarians, particularly if one considers a diversification and comprehensiveness of their areas

of activity. “This differentiation can benefit the creation, development, and acceptance of new profiles, accelerating the needs of the labor market and, finally, consolidating a vision for information science in higher education” [12, p. 37].

It is evident that updating skills is a challenge for academic librarians. This involves matching new trends in the sphere of information sciences to an updated, diversified, competent, and committed workforce who can meet the expectations of their audiences, scholars, and researchers, while they promote and support the Open Science movement, all in a context of wide change.

### **3 Methods**

#### **3.1 Content Analysis**

In the first stage, I carried out an exploratory study of the strategic references emanating from professional associations and national and international organizations related to information professionals’ competencies. I grouped the main trends in academic librarian competencies into performance clusters.

#### **3.2 Questionnaire Survey**

In the second stage, I distributed a questionnaire survey to future librarians. This aimed to analyze the perceptions of students of library and information science (LIS) regarding the skills that they thought professionals in the field must develop. The survey enabled me to observe what skills students valued for their learning and those they valued in professionals in practice, particularly those who practice the profession in higher education. The study was confidential and guaranteed the participants anonymity.

### **4 Results and Discussion**

#### **4.1 Future Trends in the Main Guiding Documents**

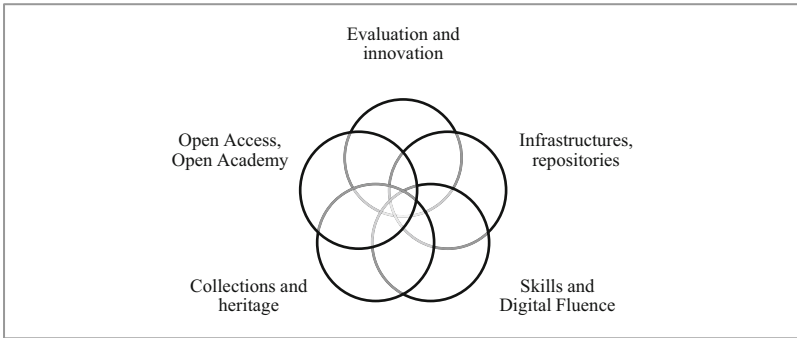
In the first stage of this study, I defined criteria for selecting the documents to analyze. Reviewing their guiding outline and strategic profile enables an understanding of the surrounding environment at a macro level. It means that these documents are recognized, accepted, and potentially adopted by their professionals’ community. They provide these actors with an orientation for their performance since they explain future trends in information, particularly in higher education. Additionally, the documents’ timeliness was confirmed by their chronological scope. I made a global search of this type of documents, checking to verify if they came from countries traditionally designated in reference to academic librarians in Portugal. The results of this research make it possible to list the producer organisms or associations, the documents under analysis, and the countries of origin and their influence area (Table 1).

After this research, I carried out an in-depth reading of each of the documents, extracting the main concepts associated with the core competency domains that librarians have to develop. It became clear that the centrality of the library is associated with

**Table 1.** Strategic current documents recovered

Org.*	Document	Origin/Influence
ACRL/ALA	<i>Standards for Libraries in Higher Education (2018)</i> <a href="http://www.ala.org/acrl/standards/standardslibraries">http://www.ala.org/acrl/standards/standardslibraries</a>	USA
ALIA	<i>LIBRARY AND INFORMATION SERVICES: The Future of the Profession Themes and scenarios 2025</i> <a href="https://read.alia.org.au/library-and-information-services-future-profession-themes-and-scenarios-2025">https://read.alia.org.au/library-and-information-services-future-profession-themes-and-scenarios-2025</a>	Australia
CARL	<i>Strategic Framework - May 2019 to May 2022</i> <a href="http://www.carl-abrc.ca/wp-content/uploads/2019/06/Strategic-Framework-May-2019-to-May-2022.pdf">http://www.carl-abrc.ca/wp-content/uploads/2019/06/Strategic-Framework-May-2019-to-May-2022.pdf</a>	Canada
CAUL	<i>CAUL's 2017 - 2019 strategic plan</i> <a href="https://www.caul.edu.au/about-caul/strategic-directions">https://www.caul.edu.au/about-caul/strategic-directions</a>	Australia
EDUCAUSE/NMC	Alexander, B., Ashford-Rowe, K., Barajas-Murph, N., Dobbin, G., Knott, J., McCormack, M.,... & Weber, N. (2019). EDUCAUSE Horizon Report 2019: Higher Education Edition (pp. 3–41). EDU19. <a href="https://www.lea.rntechlib.org/p/208644/">https://www.lea.rntechlib.org/p/208644/</a>	USA
IFLA	IFLA Strategy 2019–2024 <a href="https://www.ifla.org/units/strategy/">https://www.ifla.org/units/strategy/</a>	World
LIBER	Research Libraries Powering Sustainable Knowledge in the Digital Age <a href="https://libereurope.eu/document/liber-strategy-2018-2022/">https://libereurope.eu/document/liber-strategy-2018-2022/</a>	Europe
REBIUN	<i>Cenários do III Plan Estrategico de REBIUN 2020</i> <a href="https://www.rebiun.org/sites/default/files/2017-11/Plan%20Estrat%C3%A9gico%20REBIUN.pdf">https://www.rebiun.org/sites/default/files/2017-11/Plan%20Estrat%C3%A9gico%20REBIUN.pdf</a>	Spain
RLUK	<i>Reshaping Scholarship Strategic Plan</i> <a href="https://www.rluk.ac.uk/reshaping-scholarship-rluk-strategy-2018-21/">https://www.rluk.ac.uk/reshaping-scholarship-rluk-strategy-2018-21/</a>	UK
SCONUL	2019–2022 Strategy <a href="https://www.sconul.ac.uk/sites/default/files/documents/SCONUL%20Strategy%202019%20-%202022.pdf">https://www.sconul.ac.uk/sites/default/files/documents/SCONUL%20Strategy%202019%20-%202022.pdf</a>	UK and Ireland

\* ACRL – Association of College and Research Libraries, American Library Association; ALIA – Australian Library and Information Association; CARL - Canadian Association of Research Libraries; CAUL – Council of Australian University Libraries; EDUCAUSE/NMC – New Media Consortium; IFLA – International Federation of Library Associations and Institutions; LIBER - Ligue des Bibliothèques Européennes de Recherche – Association of European Research Libraries; REBIUN -Red de Bibliotecas Universitarias Españolas; RLUK - Research Libraries UK; SCONUL – The Society of College, National and University Libraries.



**Fig. 1.** Core competency domains

learning and research, but the documents also highlight the great themes of open access, the digital environment, content management, and the development of resources and skills of professionals (Fig. 1).

The Open Science movement has definitively transfigured the areas of activity of academic librarians. There is currently talk of openness, in a broad sense, involving open access, Open Science, and open education, to ensure the transparency and reproducibility of science. The impact is visible throughout the research cycle; also librarians must be prepared to continue to support learning and research from research to publication. To this purpose, it will be essential to deal with the need for research and storage and information data, as well as its description, curation, and dissemination. New pedagogies based on flexible and technology-based learning continue to require close monitoring, and it is desirable to ensure digital fluency for professionals and users. Finally, the functions of custody and preservation are not forgotten: the collections remain a hardcore of the librarians' activities; however, its diversity and scope have increased, including, in addition to heritage concerns, the need for inclusion, diversity, connection and reach, so the infrastructure aspects remain highlighted. It is possible to confirm the ideas of some studies [1, 24, 25] that indicate a global tendency to change the focus of action: the shift from centralizing the management of collections and the provision of content to that of service providers and access facilitators. In this sense, "skills of library and information professionals will once again be recognized, especially the ability to detach ourselves from the specific content and instead concentrate on the metadata around it. 'Find, filter, connect' will become the mantra of our profession and organizations will be eager to recruit our members, to help them find a way through the mass of intelligence, which is useless without a guide and interpreter. The most desirable skills will be a combination of information, knowledge and records management" [26, p. 29].

#### 4.2 Perceptions of the Information Skills Needed

In the second stage of the research, I carried out a survey with LIS students undergoing training. The main objective was to understand their perceptions regarding the skills to be developed to prepare for a career in librarianship. The data collection instrument was a questionnaire with three closed questions and an open question, allowing for

quantitative and qualitative analysis. I developed the questionnaire using Google forms and distributed it through my social networks. I sent the survey by mail to a list of university institutions in Portugal over one month, April 2021. The first set of questions were to identify the respondents: gender, age, and study attending degree. The sample consisted of 45 valid responses from the survey, 33 (73.3%) are female, and 10 were male (22.2%); two preferred not to answer. Regarding the degree attended or completed, the students were divided: seven (15.6%) were from an undergraduate course, 13 (28.9%) from doctoral studies, and the majority, 25 (55.6%), from master’s degrees.

The second part of the survey included three questions, all quantitative.

Question 1: In 2005, five groups of competencies and skills of European information-documentation professionals were defined. Among these, which ones do you consider to have acquired in your training? And in a professional environment? (Fig. 2).

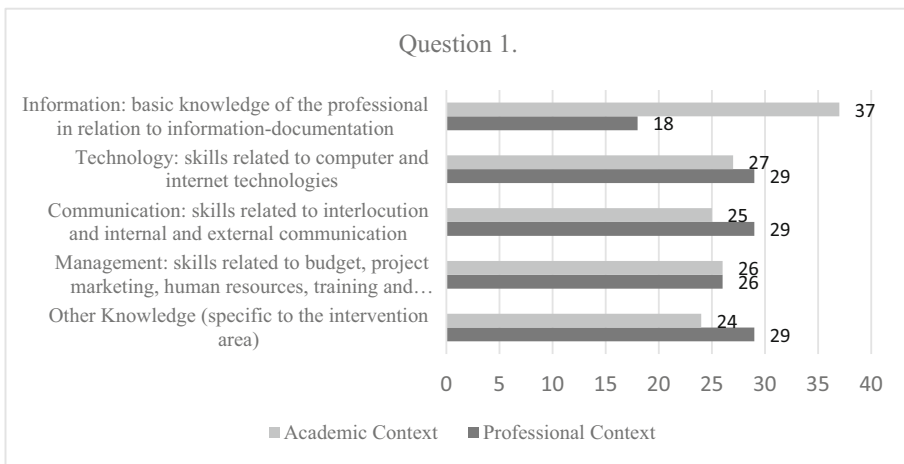


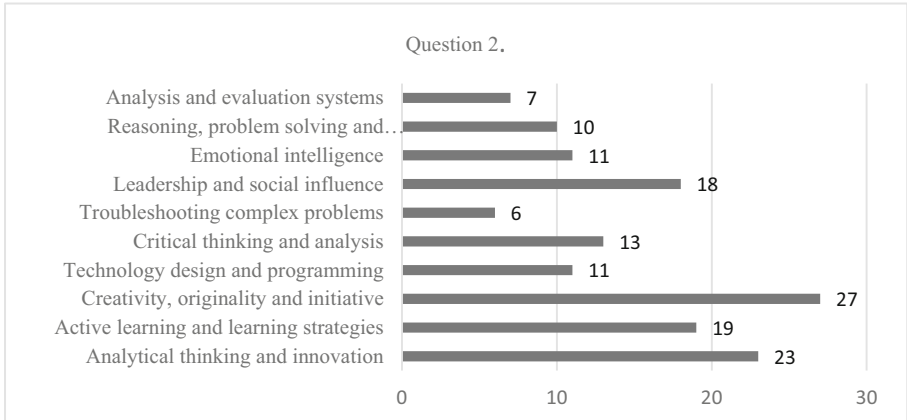
Fig. 2. Acquired skills in academic and professional contexts

Most competency-based approaches are based on the need to train professionals and to establish a profile of skills outside of basic training. In addition to basic training, in order to demonstrate competence it is necessary to have adequate levels of understanding and ability to act in a given environment, that is, a set of knowledge, skills, and attitudes mobilized for high performance in a given professional situation. In the answers to this first question, it is observed that academic competencies are more generic and related to the scope of documentation and information. Those that are preferably acquired in a professional context seem to be related to specific knowledge of a subject area.

Question 2. The World Economic Forum foresees ten areas of competence for professionals in the next decade. From your point of view, which will be the three most important for librarians to develop? (Fig. 3).

In each area of expertise, there are skills required. I asked the the students, to consider which of ten areas of competence they considered to be the most important for the next decade. These areas were inspired by the World Economic Forum [27]. Respondents choose creativity, originality, and initiative first (27, 60.0%); then, analytical thinking

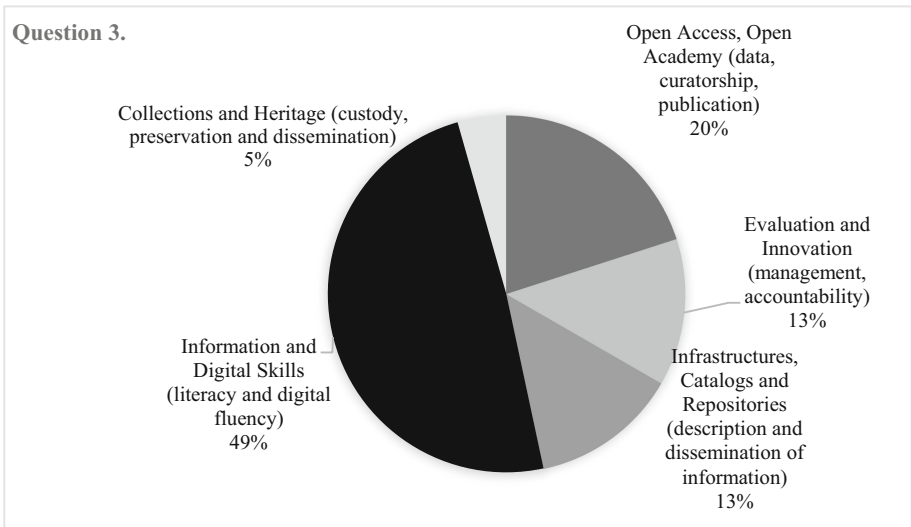




**Fig. 3.** WEF areas of competencies

and innovation (23, 51.1%); and, finally, active learning and learning strategies (19, 42.2%), closely followed by leadership and social influence (18, 40.0%). All choices are considered to be interconnected with the requirements of areas of expertise emanating from the guiding documents, revealing an alignment and confirming the pioneering, scope, and transdisciplinarity of the information and documentation area.

Question 3. Currently, information management requires professionals who are well prepared to work in different environments. Which area do you choose as the most important, soon, for librarians (particularly those working in higher education), to develop professional skills? (Fig. 4).



**Fig. 4.** The most important area to develop

Previously, based on the analysis of the guiding documents, it was possible to reach the five areas of competence for future professionals. In this question, the respondents commented on what they thought was the one that soon needs more investment. The respondents clearly preferred (22.49%) information and digital skills (literacy and digital fluency) as the competency area they felt should be most immediately addressed. The technological areas are highlighted and the issues related to open science and infrastructures appear as the following choices. Future librarians seem to be particularly sensitive to the need to develop skills in these areas. Finally, the third part of the survey included an open question. The qualitative analysis refers to the data obtained from the 9 comments left by the respondents in the space intended for the purpose. The qualitative data show that some students perceived their academic training as too theoretical: “on master’s degree learns theory, but the real world is very different. We lack the practical part, the skill to apply. We feel lost and despite having an academic ‘degree’ seems that in practice we know nothing. In my view there is a huge job to be done in terms of the training professionals, the affirmation of the professional class, their appreciation, and the skills to be developed”. In addition, they criticized the way the curriculum is constructed: “Information and Documentation courses in Portugal are not currently preparing professionals in this area for the challenges of the coming decades in terms of skills. Masters are a distortion of what were the postgraduate courses in the late ‘90s and 00 focussed on a strong technical component. The academic courses are a potpourri of generalities, not deepening the themes that can prepare future librarians to be leaders in their field”. Students also revealed that future professionals will need to develop leadership skills and a strong strategic, technical, and social position and the full ability to show “what they are in the world for”, as we move towards a scenario in which digital literacy should be a basic competence of almost all professionals.

## 5 Conclusions

Attentive and better-qualified professionals enhance their performance, bringing advantages to the institutions of which they are a part and to the users with whom they deal. Institutions, teachers, and students benefit from the investment in knowledge and learning of information professionals, that is revealed in greater expertise and professional competence in the service, in the answers to the reference questions, in the management of collections, spaces, human resources, and information, in the teaching skills and supporting research in its various aspects. This means knowing in-depth information resources, terminologies, methods, and professional practices, to respond adequately to each request, in addition to a permanent update of transversable skills to all documentation and information professionals that include a visible adaptation to the demands of the Open Science movement and its implications. A very recent study raises concerns regarding the updating and professional development of librarians, but points out some solutions, identifying the need for continuous training on the part of employers [28], the creation of positive and dynamic learning environments, and, above all, participation in cooperation networks and social networks as excellent opportunities for professional growth and updating. The consequences of improving librarians’ skills, which imply keeping abreast of current trends and recommendations for the sector, include tangible benefits in reducing costs, optimizing resources for the management of libraries,

management of knowledge, collections, and information, increasing students' academic success, improving teaching requirements and enhancing the conditions for the production and projection of developed research. These results should be motivating factors for higher education institutions in their commitment to providing conditions for the initial training of librarians, but also for the professionals themselves who must constantly seek to update them. Studies like this should be pursued to contribute to the visibility and influence of librarians but also accountability and commitment to the profession and its impact on higher education.

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## References

1. Dempsey, L., Malpas, C.: Academic library futures in a diversified university system. In: Gleason, N.W. (ed.) *Higher Education in the Era of the Fourth Industrial Revolution*, pp. 65–89. Springer, Singapore (2018). [https://doi.org/10.1007/978-981-13-0194-0\\_4](https://doi.org/10.1007/978-981-13-0194-0_4)
2. Pinfield, S., Cox, A., Rutter, S.: *Mapping the future of academic libraries: a report for SCONUL*. Report. SCONUL, London (2017)
3. Prentice, A.E.: The environmental scan. *Coll. Res. Libr. News*. **50**, 713–717 (2019)
4. Sanches, T., et al.: *Recomendações Para as bibliotecas do ensino superior: que impacto, que transformação?* In: *Actas Do 13º Congresso Nacional De Bibliotecários, Arquivistas E Documentalistas 2018*, vol. 13, pp. 1–9. Associação Portuguesa De Bibliotecários, Arquivistas E Documentalistas, Lisboa (2018)
5. *LIBER: Research Libraries Powering Sustainable Knowledge in the Digital Age: Strategy 2018–2022*. Liber (2018)
6. Scupola, A., Westh Nicolajsen, H.: Service innovation in academic libraries: is there a place for the customers? *Libr. Manag.* **31**, 304–318 (2010)
7. Jantz, R.C.: Innovation in academic libraries: an analysis of university librarians' perspectives. *Libr. Inf. Sci. Res.* **34**, 3–12 (2012)
8. Jantz, R.C.: Vision, Innovation, and leadership in research libraries. *Libr. Inf. Sci. Res.* **39**, 234–241 (2017)
9. Raju, J.: Knowledge and skills for the digital era academic library. *J. Acad. Librariansh.* **40**, 163–170 (2014)
10. Bullard, E.: Competence. In: *Salem Press Encyclopedia. Research Starters Database* (2019)
11. European Council of Information Associations. *Euro referencial I-D. Incite*. Lisboa (2005). [www.eseig.ipp.pt/documentos/doc\\_noticias/EuroReferencial\\_P.pdf](http://www.eseig.ipp.pt/documentos/doc_noticias/EuroReferencial_P.pdf)
12. Telo, P.A., Pinto, M.L.: Debater a visão europeia sobre competências de informação documentação: perspetivas, estratégias e posicionamentos. *Ciênc Inf.* **48** (2019)
13. Gerolimos, M., Konsta, R.: Librarians' skills and qualifications in a modern informational environment. *Libr. Manag.* **29**, 691–699 (2008)
14. Mahesh, G., Mittal, R.: Skills for future and current library and information professionals- perceptions of academic librarians in New Delhi. *Varlejas Jana* **4**(1), 391–401 (2014)
15. Negi, A.S., Srivastava, J.P.: Changing role of the academic library professionals in the digital era: trends, vision and challenges. *Ind. Streams. Res. J.* **4**, 1–5 (2014)

16. Gwyer, R.: Identifying and exploring future trends impacting on academic libraries: a mixed methodology using journal content analysis, focus groups, and trend reports. *N. Rev. Acad. Librariansh.* **21**, 269–285 (2015)
17. Ferreira, D.T.: As novas competências do profissional da informação bibliotecário: reflexões e práticas. In: *Biblioteca Do Século XXI: Desafios E Perspectivas*, pp. 79–90. Ipea, Brasília (2016)
18. Calarco, P.V., Schmidt, B., Kutchma, I., Shearer, K.: Time to adopt: librarians' new skills and competency profiles. Joint task force on Librarian's competencies in support of E-research and scholarly communication (2016). <https://scholar.uwindsor.ca/cgi/viewcontent.cgi?referer=https://scholar.google.pt/&httpsredir=1&article=1042&context=leddylibrarypub>
19. Schmidt, B., Shearer, K.: Librarians' competencies profile for research data management. Joint Task Force on Librarian's Competencies in Support of E-research and Scholarly Communication (2016). [https://www.coar-repositories.org/files/Competencies-for-RDM\\_June-2016.pdf](https://www.coar-repositories.org/files/Competencies-for-RDM_June-2016.pdf)
20. Calarco, P., Shearer, K., Schmidt, B., Tate, D.: Librarians' competencies profile for scholarly communication and open access. Joint Task Force on Librarian's Competencies in Support of E-research and Scholarly Communication (2016). [https://www.coar-repositories.org/files/Competencies-for-ScholComm-and-OA\\_June-2016.pdf](https://www.coar-repositories.org/files/Competencies-for-ScholComm-and-OA_June-2016.pdf)
21. King, M.: Digital scholarship Librarian: what skills and competences are needed to be a collaborative Librarian? *Int. Inf. Libr. Rev.* **50**, 40–46 (2018)
22. Yatim, N.M., Nasharudin, N., Samsudin, N.F., Said, S.M., Tarsik, N.F.: Recognizing the personal competencies of future information professionals. *Acta Inform. Malays.* **3**, 21–23 (2019)
23. Brown, S., Keene, C., Bruce, R., Lynch, C.: International advances in digital scholarship. In: *JISC and CNI Conference*. Oxford University, Oxford (2016)
24. McCaffrey, C., et al.: Open science skills visualization [internet]. In: Zenodo, 10 March 2020. <https://doi.org/10.5281/zenodo.3702401>
25. Feather, J.: The context of change: information professionals and the information professions in an information society. *Health Inf. Libr. J.* **23**, 3–9 (2006)
26. Australian Library and Information Association. *Library and Information Services: the Future of the Profession (Themes and Scenarios 2025)*. ALIA (2013). <https://read.alia.org.au/library-and-information-services-future-profession-themes-and-scenarios-2025>
27. World Economic Forum: *Towards a Reskilling Revolution: Industry-Led Action for the Future of Work*. WEF, Geneva (2019). [http://www3.weforum.org/docs/WEF\\_Towards\\_a\\_Reskilling\\_Revolution.pdf](http://www3.weforum.org/docs/WEF_Towards_a_Reskilling_Revolution.pdf)
28. Aslam, M.: Professional development and networking for academic Librarians. *J. Libr. Inf. Sci.* **7**(1), 1–20 (2017)