Perceptions of LIS Professionals on ACRL Framework: Understanding and Fostering Concepts, Skills and Attitudes in Academic Students

Tatiana Sanches[1(✉)], Maria Luz Antunes[2], and Carlos Lopes[3]

[1] Instituto de Educação, UIDEF, Universidade de Lisboa, Lisboa, Portugal
tsanches@fpie.ulisboa.pt
[2] Instituto Politécnico de Lisboa (ESTeSL), Lisboa, Portugal
mluz.antunes@estesl.ipl.pt
[3] APPsyCI, Ispa-Instituto Universitário, Lisboa, Portugal
clopes@ispa.pt

Abstract. The recently translated Framework for Information Literacy for Higher Education is generating considerable interest among Portuguese professionals. As pedagogical approaches and constructivist learning gain prominence, librarians are recognizing the crucial role they play in facilitating research skills, employing diverse pedagogical methods, and fostering information literacy as essential elements of education. This study, conducted as part of a national project focused on information literacy for academic students, aims to analyze Portuguese librarians' perceptions regarding the translated Framework. Through an extensive literature review and an online survey, the initial findings indicate that librarians possess a basic understanding of the topic while demonstrating a strong commitment to acting. Building upon the translated Framework, pedagogical materials and training opportunities have been introduced. As information literacy programs continue to be integrated, implemented, and evaluated in libraries and academic curricula, the Framework serves as a valuable reference document for information professionals and educators, offering inspiration and guidance.

Keywords: Information literacy · ACRL framework · librarians actions · learning · higher education · Portugal

1 Introduction

A few years after the publication of the *Framework for Information Literacy for Higher Education* (Framework) [1], its impact has been studied at different levels and in several regions [2–4]. However, it was only very recently that this main document was translated into Portuguese [5], which poses a challenge for information professionals in Portugal. Regardless, this shift has brought renewed energy and a new level of discussion around the training provided by academic information professionals, who pay increasing attention to teaching and learning methodologies. The pedagogical role of librarians becomes

more pressing, with pedagogical methods, constructivist learning, multiplying research techniques, and information literacy (IL) as fundamental learning elements [6]. How do Portuguese professionals react to the opportunity to know the Framework deeply and objectively and to the possibility of applying its orientations?

2 Literature Review

In the disciplinary area of IL, it is important to consider that the commitment of the professional and the researcher to their community, professional, academic, or scientific, is confirmed by continuous participation in new contributions and discoveries. This active participation fosters dialogue among community members, in an ecosystem where ideas are presented, discussed, and can be reviewed, criticized, refuted, or adopted [7]. Therefore, it is appropriate to mention the importance of the adoption of concepts and their extensive understanding, also through translation into the natural language of the beneficiaries of any reference documents. One cannot stop at the surface, since "the mere importation of concepts and application of foreign practices to different contexts without due care results in artificialisms, with little real use" [8]. It is therefore essential to understand the social and educational needs of the audience, as well as their diversity so that librarians can act to consolidate consequent actions for IL by adopting concepts, incorporating terminology, knowing the issues, and participating in academic dialogue. At the same time, it is important to approach this instrument in its reflexive nature, flexible, and permeable to diverse disciplinary practices. This view allows the Framework contents to be transformed into practical knowledge because it is applied in depth. This reveals new opportunities to connect students' learning needs with subject areas, removing barriers to participation in disciplinary communities, as it potentially creates a greater understanding of the whole curriculum [9].

These principles guided the national project "Information Literacy and Critical Thinking in Higher Education: fighting misinformation", developed within the scope of the Portuguese Association of Librarians, Archivists, and Information and Documentation Professionals (BAD). This means that there was an intention for librarians, particularly those who interact directly with academic students, to be prepared to provide guidance to empower them in the search and discovery of meaningful and reliable information. To this end, it was necessary to translate the Framework and actively train these stakeholders, making this document known in a clear and objective way while seeking to frame other complementary actions. As in similar experiences [10], the translation of the Framework seems to have been fundamental for its reception to be successful. In fact, in 2019, before this translation, a study was developed in Portugal [11], with academic librarians, which aimed to observe to what extent the Framework was known and was already being adopted, achieving a renewal of pedagogical processes, and implementing innovation in IL teaching methodologies. Like previous studies [12–14], it sought to understand whether the Framework had penetrated the pedagogical practices of Portuguese librarians, and to what extent librarians are willing to practice it, but the responses were disappointing. Although sensitized, they did not demonstrate a consistent or confident path in these new formative practices, compatible with similar results from other communities at the beginning of the document's implementation [15]. In contrast,

some natural English-speaking communities showed quite a good implementation of the Framework [2, 16]. Thus, several speeds of implementation are perceived, not only by different communities, but even within the same community, by different actors implementing training strategies based on the Framework at equally diverse levels, which means that, at the same time, acceptance of the Framework by librarians has not been universal, implementing the Framework into one-shot IL instruction is difficult, and full implementation of the Framework may require a restructuring of how IL education is approached [17].

It is thus understood that to meet an extended implementation objective of the Framework it is necessary to develop complementary training strategies [18] aimed at deepening transversal competencies, combining coping with information needs with search strategies to identify appropriate search tools, as well as to demonstrate persistence, adaptability, and flexibility. In addition, context needs to be considered. IL-based learning relies on meaningful questions for students, as long as they are placed in a context. Because IL skills are transversal and applicable to various disciplines, they are transferable to different subjects [19–21], promoting students' capacity development in academia and lifelong learning. The Framework presents a pattern of integrated competencies that address the reflective discovery of information, the understanding of how information is produced and valued, and the ethical and legal use in the creation of new knowledge and ethical participation in learning communities [1], thus renewing the concept of IL. Indeed, participation in communities of practice is also mentioned as a relevant outcome of the successful application of this guideline document [22], so it should be kept in mind that joint actions to train librarians can work well.

The Framework presents a set of conceptual frames and interconnected main concepts, which represent overarching ideas intended for application within any academic disciplines, namely: Authority is constructed and contextual; Information creation as a process; Information has value; Research as inquiry; Scholarship as conversation; Searching as strategic exploration.

This set of frames that integrate goals and concepts to be achieved and surpassed, in order to guarantee the development of genuine knowledge in a discipline, profession, or domain of knowledge, must be understood in an interconnected way and interpreted in its implementation in a flexible way. The Framework provides guidance, suggesting methods and strategies, as well as content and exercises to be developed. At the same time, academic librarians have pedagogical experience, essentially based on the application of previous standards, which is important, but out of line with what is currently intended [23]. Knapp and Brower exemplify that "information literacy is no longer outlined as a series of objectives to be learned early in one's academic career. Instead, information literacy forms a framework to sustain an ongoing and increasingly demanding relationship with information over the lifetime of a student" [24, p. 466]. In addition, librarians do not seem to be aware of strategies to combat disinformation [25], but the current context encourages us to take a proactive stance in relation to this matter. The literature underlines the importance of the educational factor: the training of users motivated by knowledge enhances the distinction of the veracity of what is stated and allows for identifying the most suitable scenario for the production of knowledge. Better-prepared individuals assume that the information available on the Internet is insufficient.

Inspired by initiatives developed based on the Framework [17, 26], and specifically designed to combat disinformation [27–31] and aware that structured training remains scarce, the authors proposed to build some strategies for training in academic institutions. Several initiatives were developed to promote knowledge of the Framework, providing training strategies and pedagogical practices on the use of IL for combating misinformation. Thus, the official translation of the guiding document is available on the Project website, also shared by the entity that authored it (https://www.ala.org/acrl/standards/ilframework), for access and download. Six brochures were also designed to distribute, but they are also available in digital format to be used with all the supporting information (https://bad.pt/formacao/projetos/combater_desinformacao/). In these brochures, a work has been developed for each frame where pedagogical strategies for combating disinformation are associated, which in this way describes and explains: core concepts of the Framework; knowledge practices; dispositions; initial questions; topics for reflection; additional readings; strategies against disinformation.

Bookmarks were also designed as well as, most importantly, PowerPoint slides that are available in open access for reuse. This work was developed by aligning the principles of critical thinking with each frame and based on the following ideas:

- Remain skeptical, but with an open mind! (Authority is constructed and contextual)
- Recognize the meaning of the creation process! (Information creation as a process)
- Understand rights and duties when integrated into an academic community! (Information has value)
- Recognize that new discoveries occur as a result of various perspectives and interpretations! (Research as inquiry)
- Promote in-depth debate and dialogue around knowledge! (Scholarship as conversation)
- Understand that information research is a complex and contextualized experience that affects and is affected by the researcher's social, affective, and cognitive dimensions. (Searching as strategic exploration)

In designing the project, efforts were made to identify similar training strategies, their pertinence, feasibility, and adequacy to the national context, determine objectives, target audience, skills to be acquired, and detail learning content. Despite these intentions, it was interesting to see if the Framework knowledge – basic for the transversal implementation of IL – met expectations.

3   Methods

This study aims to analyze the perceptions of information professionals about the knowledge and practical applicability of the six frames that make up the *Framework for Information Literacy for Higher Education*. Perceives the understanding of concepts, skills, and attitudes that students can develop in their academic context, with the support of information professionals.

The study presents a project of practical and programmatic application of IL teaching developed in Portugal. To understand how the Framework is understood and applied in Portugal by information professionals, an online questionnaire was created consisting

of seven closed questions and one open question, which was distributed among the participants of a webinar held for this community on the subject.

The questionnaire began with a sociodemographic characterization of the respondents. This category included the type identification of the library to which it belonged (academic, school, public, archive, governmental organization, or other).

It was then questioned whether the respondent usually carried out IL training with students and whether he had prior knowledge of the Framework's contents. In this context, an attempt was made to perceive the knowledge and understanding level of the frames before and after the participation in the webinar – minimal level (basic knowledge), developing (which the concept was already applied), and proficient (which the concept was already applied intentionally and effectively); the option of answering «I don't know/Does not apply» was also offered. An attempt was also made to find out which frames these professionals intended to incorporate into their training and also which knowledge practices and dispositions or attitudes they considered most important for students to develop. It also asked whether they were considering incorporating the fight against fake news and disinformation in training actions aimed at students. And, in this sense, whether the materials created within the scope of the Project and available on the website would be relevant for training.

The questionnaire ended with an open question, giving the respondent the opportunity to leave a suggestion or opinion.

4   Results

4.1   Sociodemographic Characterization

Eighty information professionals and library managers answered the questionnaire answered the questionnaire: 70 (87.5%) female and 10 (12.5%) male. The average age was 48.3 years - the youngest was 30 years old and the oldest was 62. When questioned about their professional background, 59 (73.8%) answered working in academic libraries.

4.2   Quantitative Results (Closed-Ended Questions)

Information professionals were asked whether they usually provide IL training to students – 44 (55%) said yes. When asked whether they had prior knowledge of the Framework, the answer remains positive: 48 (60%).

These professionals were then asked about their knowledge and understanding of each of the frames (Fig. 1). «Authority is constructed and contextual» frame stands out; it is the one with the greatest discrepancy between developing and proficient knowledge values. Both «Searching as strategic exploration» and «Information has value» are the frames that present the highest values regarding the highest level of knowledge.

And because they had just attended the webinar, the information professionals were then asked about their level of knowledge after learning about the Framework (Fig. 2).

Compared to the previous answers (Fig. 1), the values have increased. In general, the values representing a proficient level of knowledge stand out, as the «Information has
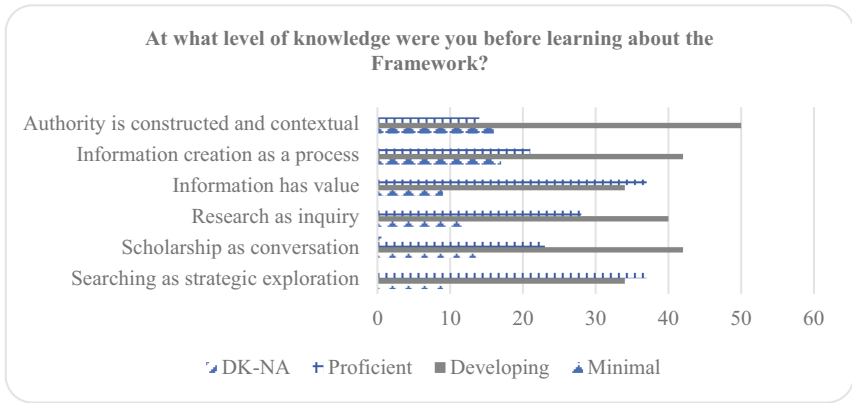
Fig. 1. Frequencies recorded in answer to the question: At what level of knowledge were you before learning about the Framework?
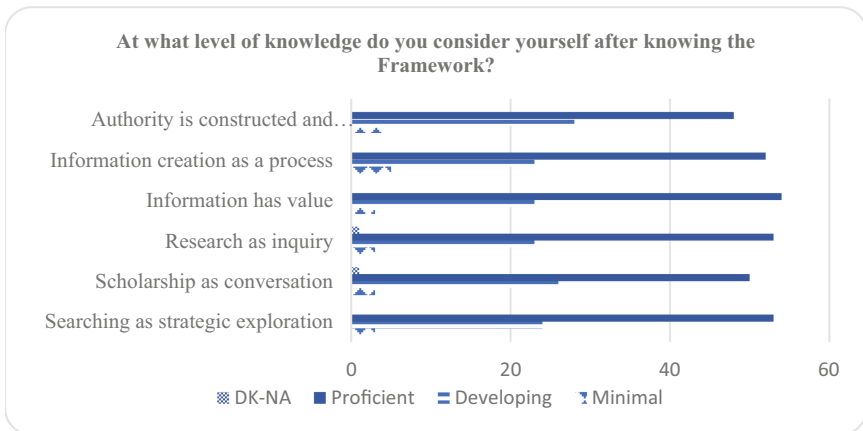

Fig. 2. Frequencies recorded in answer to the question: At what level of knowledge do you consider yourself after knowing the Framework?

value» frame. The greatest increase between the developing and proficient levels is that of «Authority is constructed and contextual», even though the proficient level shows the lowest values of the frames as a whole.

The next question sought to identify which frames information professionals intended to adopt in their regular training.

Figure 3 demonstrates that «Searching as strategic exploration» and «Information has value» are the two frames that respondents highlight, with 71.3% of preferences each. «Authority is constructed and contextual» and «Scholarship as conversation» are the least valued frames (47.5% and 50%). And 10% of respondents maintain their reservations because they do not feel prepared to use them in their training yet.

We then tried to determine which knowledge practices information professionals consider most important for students to develop.
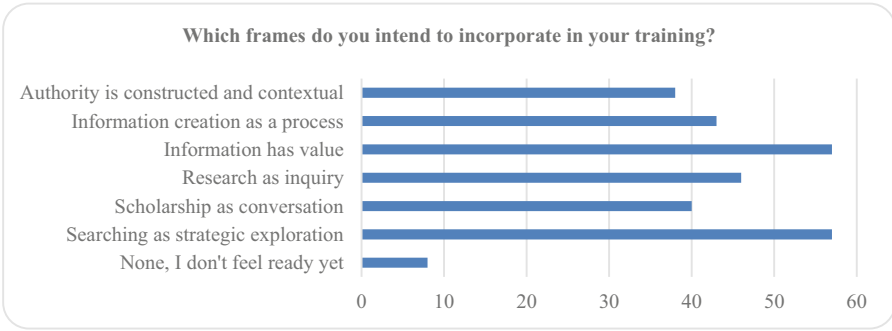
Fig. 3. Percentages of answers to the question: Which frames do you intend to incorporate in your training?
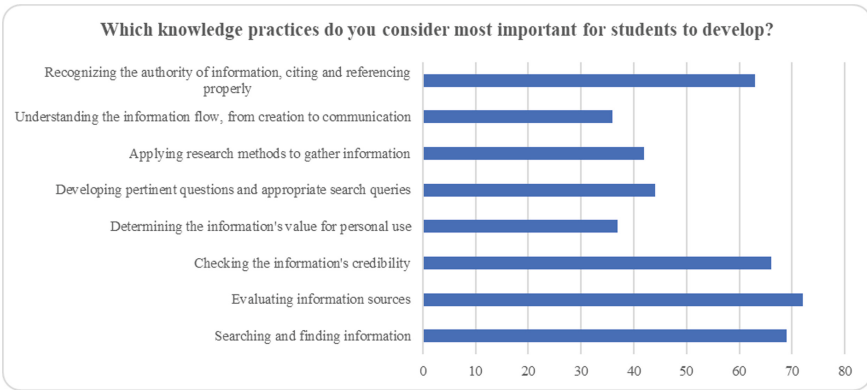

Fig. 4. Percentages of answers to the question: Which knowledge practices do you consider most important for students to develop?

Of the respondents, 90% consider that it will be the evaluation of information sources, followed very closely by searching for and finding information (86.3%), checking the information credibility (82.5%), and recognizing the sources' authority (78.9%) (see Fig. 4). Understanding the flow of information, from its creation to its communication, and determining the information's value are the two practices least valued by respondents (45% and 46.3%).

When asked about the dispositions or attitudes they consider most important for students to develop, information professionals highlighted the notion of critical awareness and ethics (83.8%) and critical thinking (81.3%). Humility and flexibility towards the information ecosystem (35%), open-mindedness (40%), and, with the same score (41.3%), respect and appreciation, as well as self-awareness and self-assessment were pointed out as less relevant (Fig. 5).

Regarding the need to incorporate the fight against fake news and misinformation in the students' training, 52.5% of the respondents answered affirmatively, and 2.5% said
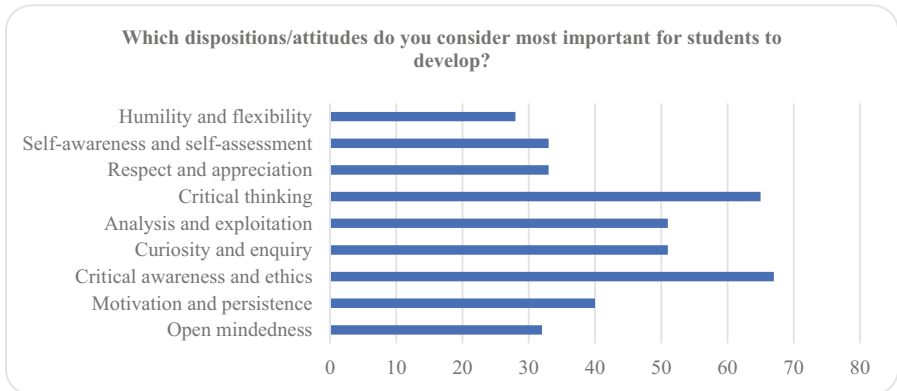
Fig. 5. Percentages of answers to the question: Which dispositions/attitudes do you consider most important for students to develop?

no. Some of them express some doubts (42.5%), so they have not yet decided whether they will do so. But 1.2% of respondents already do so.

Concerning the materials made available on the Project website and for future use in their training, the information professionals expressed a preference for the Framework (83.8%) as a work reference, the open and reusable slides (PPT) (63.7%) and the brochures (52.5%). Bookmarks are not preferred (25%).

4.3   Qualitative Results (Open Question)

In the open question about how to develop this training for students, information professionals presented some ideas on how to ensure the effectiveness of the intervention identified in the previous question: the development of practical activities, applying fact-checking strategies and games dedicated to the topic (e.g., using Mentimeter); debates on the correct use of information and the negative impact of misinformation on society; also debates on IL in a reflexive and iterative approach; the inclusion of press articles and social media in the training to teach how to search and filter the information to be used – and, in this scope, the focus should be on current issues; a strong investment in strategies to search for reliable information; a focus on brochures and other dissemination materials; and the inclusion of these issues in the discipline of Research Methodology in collaboration with teachers. Generally speaking, the main focus is on investment in regular and continued training.

Finally, and still within the scope of the open question, some information professionals confessed that they had already tried to explore the Framework, found the document difficult to approach, but were planning to use it in the next school year's training courses.

5   Discussion

The aim of this study was to analyze the perceptions of information professionals about the knowledge and practical applicability of the six frames that make up the Framework, considering the understanding of the concepts, skills, and attitudes that academic students can develop in an academic context.

The information professionals surveyed refer to some difficulties in using the Framework; the lack of time, the fact that it is a document, in their view, of difficult understanding, but also of different construction and too abstract. These considerations, as well as the perception of some elitism, are characteristics also mentioned in other studies [2, 3, 16, 17, 32]. Even so, the respondents in this study expressed the desire to work better on the Framework and to apply it in the future.

The six Framework frames were analyzed by information professionals. «Searching as strategic exploration» is the one in which they feel most comfortable. In fact, they have always done it and dominated their strategies of action. Regarding «Information has value» it is not surprising that it is so significant in the information and Open Science ecosystem; these professionals have also become experts in this field and its social and economic constraints [7]. Some studies reveal that the frames «Searching as strategic exploration» and «Research as inquiry» are the frames highlighted by librarians and teachers in their studies [4, 32]. It is important to reflect on the reasons why some frames are preferred, why some are taught more than others and how to teach the supposedly more difficult frames. In this context, the issue of Framework difficulty, lack of confidence in training and time can also be addressed [2]. Time is a big problem; it is very difficult to teach the whole document and make students reflect on its contents when these information professionals have only one session and little more than 90 min for that.

The webinar proved to be an added value for the participants. A little less than half were unfamiliar with the contents and scope of the Framework, so this was an opportunity to get to know the document. For those who already knew it, it was an opportunity to demystify doubts and fears. It is therefore not surprising that the minimal and developing levels of knowledge shown at the beginning of the session have reached a significantly proficient level in some frames – for instance, «Information has value», «Searching as strategic exploration», «Research as inquiry», and «Information creation as a process".

Of all the frames, «Authority is constructed and contextual» remains, however, the one with the lowest levels of understanding. Even though information professionals expressed a more balanced understanding of its importance at the end of the webinar, they still do not feel completely comfortable. They assume that knowing the authority of information and sources is important for their recognition and that it is a knowledge practice that students should develop – but they do not consider it the most significant. In this regard, trying to communicate the notion of authority in an unfamiliar knowledge area can be a frustrating experience, because it is time-consuming and requires a lot of searches just to become familiar with one or another aspect of the subject [33]. For these respondents, the most important is evaluating sources of information, searching for and locating information, and checking the credibility of information. It is surprising that they did not reflect a little on the fact that information authority is directly interconnected with information credibility and evaluation.

Regarding the dispositions and attitudes to be developed in students, it is interesting to note the concern to stimulate autonomy, critical thinking, curiosity, and reflective and conscious analysis of the students in training and in relation to the universe of information that surrounds them. The humility and flexibility shown in the information search process do not, however, seem to be significant for the information professionals surveyed. All these characteristics were directly associated with the need to discuss the theme of fake news and misinformation with students, as they consume and understand information as a given and immediate fact, interconnecting it with the Framework. And here the information professionals were divided and the answers reveal some caution - still present the difficulty of understanding the document and the lack of time needed to create the desired articulation. The materials created within the Project were considered again, showing a clear preference for the translation of the Framework and the slides disseminated in an open and reusable format. The suggestions they presented, especially those associated with practical activities such as workshops, games, and social media, seem to be preferred by the respondents; it is probably one of the most didactic, quickest, and most immediate ways to pass on the information and ensure its understanding. But neither the debates nor the need to integrate these contents in the curriculum of the Research Methodology discipline in an effective culture of collaboration with teachers was forgotten.

6   Conclusions

This study presents a project of practical and programmatic application of IL teaching developed in Portugal. It concludes that the Framework offers information professionals a model for reflection on training and learning strategies. Academic students were not forgotten; they have here a unique opportunity to also reflect on their learning.

As a guiding document, the introduction of the Framework in academic students' education allows for the renewal of the information literacy assessment program towards a new assessment model based on strategies and outcomes.

For future studies, it is considered important to follow up on this project and expand it in the context of creating a practice community to reflect and engage academic librarians and teachers on the importance of the Framework and its strategic role in the improvement of learning.

Finally, the ACRL Framework highlights information science as a discipline that integrates concepts that cut across all areas of knowledge, but also highlights the vulnerability of its greatest asset – information – and therefore presents learning and reflections for its strengthening.

References

1. Association of College and Research Libraries: Framework for Information Literacy for Higher Education. (2016)
2. Julien, H.E., Gross, M., Latham, D., Baer, A.: The Information Literacy Framework: Case Studies of Successful Implementation. Rowman & Littlefield (2020)
3. Julien, H., Latham, D., Gross, M., Moses, L., Warren, F.: Information literacy practices and perceptions of community college librarians in Florida and New York. Commun. Inf. Literacy **14**, 287–324 (2020)
4. Guth, L.F., Arnold, J.M., Bielat, V.E., Perez-Stable, M.A., Vander Meer, P.F.: Faculty voices on the framework: implications for instruction and dialogue. Libr. Acad. **18**, 693–718 (2018)
5. ACRL, Sanches, T., Antunes, M.L., Lopes, C.: Referencial da literacia da informação para o ensino superior (tradução portuguesa). BAD (2022)
6. Caffrey, C., et al.: Library instruction and information literacy 2021. Ref. Serv. Rev. **50**, 271–355 (2022)
7. Antunes, M.L., Sanches, T., Lopes, C., Alonso-Arévalo, J.: Publicar en el ecosistema de la ciencia abierta. Cuad. Docum. Multimedia. **31**, e71449–e71449 (2020)
8. Dudziak, E.A.: Políticas de competência em informação: leitura sobre os primórdios e a visão dos pioneiros da ınformation literacy. In: Alves, F.M., Corrêa, E.C., Lucas, E.R. (eds.) Competência Em İnformação: Políticas Públicas, Teoria E Prática, pp. 19–50. Edufba (2016)
9. Miller, S.D.: Diving deep: reflective questions for identifying tacit disciplinary information literacy knowledge practices, dispositions, and values through the ACRL framework for information literacy. J. Acad. Librariansh. **44**, 412–418 (2018)
10. Schoenbeck, O., Schröter, M., Werr, N.: Making of oder lost in translation? Das framework for information literacy for higher education – herausforderungen bei der übersetzung ins deutsche und der bibliothekarischen anwendung. O-Bib Off. Biblioteks. J. **8**, 1–16 (2021)
11. Sanches, T., Borges, M.M.: New data on knowledge and application of information literacy framework in higher education libraries: results of a questionnaire survey to Portuguese librarians. Qual. Quant. Methods Libr. **8**, 561–578 (2019)
12. Schulte, S.J., Knapp, M.: Awareness, adoption, and application of the association of college & research libraries (ACRL) framework for information literacy in health sciences libraries. J. Med. Libr. Assoc. **105**, 347–354 (2017)
13. Charles, L.H.: Embracing challenges in times of change: a survey of the readiness of academic librarians in New Jersey for transition to the ACRL framework. Commun. Inf. Literacy. **11**, 221–245 (2017)
14. Lapointe, J.M., Jacobson, T., Gibson, C.: Retour sur le référentiel de l'acrl avec ceux qui l'ont créé. Can. J. Acad. Librariansh. **7**, 1–16 (2021)
15. Brager, T., Pittman, K., Mars, A.: Don't panic: the academic librarian's guide to building community around the ACRL framework. In: Sietz, B. (ed.) LOEX 2018 Conference: New Frontiers – Exploring and Innovating in Uncharted Territory, pp. 71–76, Houston (2018)
16. Hsieh, M.L., Dawson, P.H., Yang, S.Q.: The ACRL framework successes and challenges since 2016: a survey. J. Acad. Librariansh. **47**, 102306 (2021)
17. Gross, M., Latham, D., Julien, H.: What the framework means to me: attitudes of academic librarians toward the ACRL framework for information literacy for higher education. Libr. Inf. Sci. Res. **40**, 262–268 (2018)
18. Fisher, Z.: Facing the frames: using the framework as a guide for a credit-bearing information literacy course. C&RL News. **78**, 354–358 (2017)
19. Seeber, K.P.: This is really happening: criticality and discussions of context in ACRL's framework for information literacy. Commun. Inf. Literacy. **9**, 157–163 (2015)

20. Hosier, A.: Creating learning outcomes from threshold concepts for information literacy instruction. Coll. Undergrad. Libr. **24**, 1–13 (2017)
21. Bauder, J., Rod, C.: Crossing thresholds: critical information literacy pedagogy and the ACRL framework. Coll. Undergrad. Libr. **23**, 252–264 (2016)
22. Fullard, A.: Using the ACRL framework for information literacy to foster teaching and learning partnerships. South. Afr. J. Libr. Inf. Sci. **82**, 46–56 (2016)
23. Foasberg, N.M.: From standards to frameworks for IL: how the ACRL framework addresses critiques of the standards. Portal. Libr Acad. **15**, 699–717 (2015)
24. Knapp, M., Brower, S.: The ACRL framework for information literacy in higher education: implications for health sciences librarianship. Med. Ref. Serv. Q. **33**, 460–468 (2014)
25. Antunes, M.L., Lopes, C., Sanches, T.: Como combater as fake news através da literacia da informação? Desafios e estratégias formativas no ensino superior. BiD 46 (2021)
26. Young, S., Maley, M.: Using practitioner-engaged evidence synthesis to teach research and information literacy skills: a model and case study. J. Acad. Librariansh. **44**, 231–237 (2018)
27. Anz, K., Kingsland, E.S.: Fake or for real? a fake news workshop. Ref. Serv. Rev. **48**, 91–112 (2020)
28. Caridad-Sebastián, M., Morales-García, A.M., Martínez-Cardama, S., García-López, F.: Infomediation and post-truth: the role of libraries. Prof Inf. **27**, 891–898 (2018)
29. Martínez-Cardama, S., Algora-Cancho, L.: Fighting disinformation from academic libraries. Prof. Inf. **28**, e280412 (2019)
30. Evanson, C., Sponsel, J.: From syndication to misinformation: how undergraduate students engage with and evaluate digital news. Commun. Inf. Literacy. **13**, 228–250 (2019)
31. Musgrove, A.T., Powers, J.R., Rebar, L.C., Musgrove, G.J.: Real or fake? resources for teaching college students how to identify fake news. Coll. Undergrad. Libr. **25**, 243–260 (2018)
32. Wengler, S., Wolff-Eisenberg, C.: Community college librarians and the ACRL framework: findings from a national study. Coll. Res. Libr. **81**, 66–95 (2020)
33. Pullman, E.: Applying the framework as a reflective tool: a teacher learner perspective. Cool. Res. Libr. News. **79**, 416–419 (2018)