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Evolution of Academic Production in Information Science: Theses and Dissertations in Portugal (2014-2024)

Tatiana Sanches[1, 2] Luiza Baptista Melo[3, 4]

[1]UIDEF, Instituto de Educação, Universidade de Lisboa, Portugal
[2]APPsy-CI, ISPA – Instituto Universitário, Lisboa, Portugal
[3]Faculdade de Medicina Dentária, Universidade de Lisboa, Portugal
[4]Universidade de Évora - Centro Interdisciplinar de História, Culturas e Sociedades, Portugal

Abstract: Academic training in information science is guided by international guidelines that establish essential structuring axes for preparing future information professionals. These axes include: Information in Society; Foundations of the LIS Profession; Information and Communication Technologies; Research and Innovation; Information Resources Management; Management for Information Professionals; Information Needs and User Services; Literacies and Learning. However, technological advances and changes in information practices have led to the emergence of new research topics, such as Communicating Value, Data Curation, Digital Preservation, Ubiquity of Information Technologies and Associated Ethical Problems, Mobile Devices and Environments, Acquisition and Use of E-books, Communication and Publication of Information, User Behaviours and Expectations, and Information Professionals.
Against this backdrop, this study aims to investigate whether the theses and dissertations developed by higher education students in Information Science in Portugal align with the traditional axes of training in the area or reflect a growing tendency to explore emerging themes. To this end, an exploratory analysis was carried out of the academic works available in the RENATES (National Registration of Dissertation and Thesis), considering master's dissertations and doctoral thesis in Library and Information Science. The study followed a quantitative and qualitative methodology, starting with the creation of a corpus of analysis based on criteria such as keywords, abstracts, and thematic classification. The academic papers were categorized according to their adherence to traditional or emerging themes, allowing a comparison between the two approaches. By

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analysing the results, this study contributes to a reflection on the adequacy of academic curricula to the emerging demands of the market and society. The research points to the need for a balance between traditional training and the incorporation of new themes, ensuring that information professionals are prepared for contemporary challenges. The discussion also highlights the importance of internationalizing research and exchanging experiences between institutions in different contexts, promoting a broad and up-to-date vision of Information Science.
Keywords: Information Science; Research Trends; Theses and Dissertations; Academic Training; Portugal

1. Introduction

Library and Information Science (LIS) education has evolved significantly over time and varies across international contexts. Academic training in this field is structured into different levels - pre-university technical programs, undergraduate degrees, and postgraduate studies (Grimes & Grimes, 2008). Institutions have adapted course titles and contents to reflect changes in the information landscape, particularly the shift from printed to electronic resources and the expansion of information sources (Chu, 2010). In countries like the United States and Canada, librarians typically undertake a master's degree in LIS, while in Germany, academic librarians usually begin with a graduation in a specific discipline followed by professional training. Australia offers programs such as the Master of Information Management or Master of Information Studies, alongside vocational qualifications like the Diploma of Library and Information Services for library technicians (Sanches et al., 2024).

The undergraduate LIS curriculum has been characterized by a comprehensive and interdisciplinary approach, integrating both foundational knowledge and emerging trends. Key areas include cataloguing, collection management, acquisitions, preservation, and the use of information technologies. Contemporary concerns such as information literacy, open science, bibliometrics, digital data management, and multicultural education have also gained prominence (Albee, 2015; Borko, 1984; Gollop, 1999; Weech & Pluzhenskaia, 2005). Curricular reforms have responded to social and technological changes, aiming to equip future professionals with the skills needed to manage information in complex, digitally-driven environments (Johnson, 2007). In the European context, the Bologna Process promoted the harmonization of higher education through the adoption of a three-cycle system (bachelor's, master's, doctorate), enhancing academic mobility and the comparability of degrees (Ribeiro et al., 2009).

Within this evolving framework, international bodies such as the International Federation of Library Associations and Institutions (IFLA) have played a central role in defining core curricular components. The IFLA Guidelines for Professional Library/Information Educational Programs (2000, updated in 2012) outline key thematic axes for LIS education, including: Information in Society; Foundations of the LIS Profession; Information and Communication Technologies; Research and Innovation; Information Resources Management; Management for Information Professionals; Information Needs and User Services; and Literacies and Learning. Nonetheless, the rapid development of

digital technologies and the transformation of information practices have led to the emergence of new research areas. These include Communicating Value, Data Curation, Digital Preservation, the Ubiquity of Information Technologies and Associated Ethical Issues, Mobile Devices and Environments, Acquisition and Use of E-books, User Behaviour and Expectations, and the Evolving Role of Information Professionals.

Against this backdrop, the present study explores whether academic work developed by students in LIS programs in Portugal aligns with these internationally recognized educational axes or reflects a growing engagement with emerging topics. More specifically, the study aims to investigate the thematic scope of master's dissertations and doctoral theses available in the RENATES (National Registration of Dissertation and Thesis), in line with previous research (Silva, 2013). Adopting quantitative and qualitative approaches, this research builds an analytical corpus based on criteria such as keywords, abstracts, and thematic classifications. The documents are categorized according to their alignment with either traditional or emerging curricular themes, enabling a comparative overview. By analysing these academic outputs, the study contributes to a broader reflection on the alignment between LIS curricula and the evolving demands of the profession. The findings underscore the importance of maintaining a balance between foundational training and innovation, ensuring that future information professionals are prepared to meet contemporary challenges. Furthermore, the study highlights the need for international collaboration and knowledge exchange to promote a global, up-to-date vision of LIS education.

2. Literature review

Library and Information Science (LIS) education has undergone significant transformations to align with the evolving demands of the information profession. Central to this evolution are the guidelines and competencies established by leading professional organizations, notably the American Library Association (ALA) and the International Federation of Library Associations and Institutions (IFLA). The ALA's Core Competences of Librarianship delineate the foundational knowledge expected of LIS professionals. These competencies encompass areas such as:

- Foundations of the Profession
- Information Resources
- Organization of Recorded Knowledge and Information
- Technological Knowledge and Skills
- Reference and User Services
- Research and Evidence-Based Practice
- Continuing Education and Lifelong Learning

These competencies also serve as a framework for LIS curricula, ensuring that graduates possess the essential skills and knowledge required for effective practice in diverse information environments. Complementing the ALA's

competencies, the IFLA has developed the Guidelines for Professional Library and Information Science (LIS) Education Programmes. These guidelines outline eight Foundational Knowledge Areas (FKAs) that are integral to LIS education:

- Information in Society
- Foundations of the LIS Profession
- Information and Communication Technologies
- Research and Innovation
- Information Resources Management
- Management for Information Professionals
- Information Needs and User Services
- Literacies and Learning

These FKAs provide a comprehensive framework for developing LIS curricula that are responsive to the dynamic nature of the information field. Recent studies have examined the evolution of LIS curricula in response to emerging trends and societal needs. Chung, et al. (2022) analyzed data from the Association for Library and Information Science Education (ALISE) and found that, over the past two decades, LIS programs have increasingly incorporated themes of diversity and interdisciplinary work, reflecting broader shifts in the profession. Similarly, research by Fraser-Arnott (2022) highlights the importance of aligning LIS curricula with global trends to ensure that graduates are equipped with the requisite skills and knowledge to navigate the rapidly changing information landscape.

Furthermore, the integration of equity, diversity, and inclusion (EDI) principles into LIS education has gained prominence (Chu & Raju, 2020). A recent study (Luo, 2025) explored how graduate-level LIS curricula can be redesigned to be more socially just and better prepare graduates to address EDI issues in their professional practice.

Incorporating these competencies and guidelines into LIS education ensures that graduates are not only grounded in the foundational aspects of the profession but are also adept at addressing contemporary challenges (Yatim, et al., 2019). This alignment is crucial for preparing information professionals who can effectively serve diverse communities and adapt to the evolving information landscape.

To complement the earlier discussion, it is important to recognize that LIS professionals must contend with a rapidly evolving information landscape, characterized by new technologies, emerging research paradigms, and diverse user needs. As Hayes (2023) highlights, LIS professionals are tasked with navigating open science, performing systematic research evaluations, and responding to the growing demand for information literacy updates. These challenges emphasize the necessity for continuous professional development and the acquisition of new competencies, as noted by Sanches (2022).

Scholars and institutions have been actively debating the skill sets required for effective information professionals. The works of Calarco et al. (2016), Gerolimos & Konsta (2008), Santos-Hermosa & Atenas (2022), among others, stress that the profession's competencies must evolve in response to these challenges. According to the European Council of Information and

Documentation Associations (ECIA, 2005), LIS programs must ensure that graduates are not only proficient in traditional competencies but are also equipped with advanced technological skills and an understanding of the broader societal and organizational contexts in which information is managed.

The importance of evolving core competencies is evident in the synthesis of Gorman and Corbitt (2002), which identifies four key areas of expertise necessary for contemporary LIS professionals: 1) The Organization of Knowledge and Resources, which involves cataloging, indexing, metadata management, and understanding user behavior in information retrieval. 2) Technology Utilization, which requires mastery over digital information management, including staying abreast of technological trends and designing accessible web-based systems. 3) Management, which emphasizes leadership, strategic planning, and ethical decision-making within diverse and multicultural environments. 4) Client Needs and Services, which stresses the importance of providing user-centered services and advocating for the information needs of diverse communities. As the authors (Gorman and Corbitt, 2002) underscore, integrating technology into functional competencies has become a key focus in LIS education. Similarly, Barden (1997) argues that the training and development of information professionals must extend beyond traditional techniques and incorporate contemporary management principles. He suggests that information professionals should adopt business management insights to understand their value within organizations. This shift in focus toward organizational contribution is crucial, as LIS professionals are no longer seen solely as custodians of information, but as active players in fostering organizational knowledge and supporting broader societal goals, along with new skills and competency profiles (Schmidt, et al., 2016). Furthermore, Gerolimos (2009) cautions against the overemphasis on digital skills at the expense of the foundational aspects of the profession. The study advocates for a balanced approach, where the core functions of information management - such as organization, preservation, and access to information - remain central (Alvim & Vargues, 2024). The tools may evolve, but the profession's primary goal of enabling access to knowledge must remain constant (Li, 2013).

In Portugal, previous studies (Silva, 2013; Mendes, 2021; Oliveira, 2022) have explored the evolution of Information Science education, focusing on the historical development of related programs and the impact of international frameworks such as the Bologna Process on curriculum design. These studies highlight the continuous adaptation of Information Science courses to technological advancements and the growing demand for specialized competencies in the field. The research also critically analyzes the alignment of academic offerings with professional standards set by global organizations, such as the American Library Association (ALA) and the International Federation of Library Associations and Institutions (IFLA), emphasizing the need for a balanced approach that integrates both traditional and emerging knowledge areas. In summary, the debate surrounding LIS professional training suggests that the curriculum should evolve to reflect both traditional competencies and

emerging trends. While technology, digital literacy, and management skills are increasingly integral, it is essential that LIS programs retain a strong emphasis on the foundational principles of information organization and preservation. This comprehensive approach will ensure that future professionals are well-prepared to meet both current and future challenges in the information landscape.

3. Methods

For this study, a mixed-methods approach was adopted, combining both quantitative and qualitative analysis to explore the alignment between academic research in Library and Information Science (LIS) in Portugal and the curriculum guidelines established by international bodies such as the American Library Association (ALA) and the International Federation of Library Associations and Institutions (IFLA). The objective is to evaluate whether the research topics covered in theses and dissertations from LIS programs reflect the Foundational Knowledge Areas (FKAs) outlined in these guidelines and identify emerging themes in the field. Data for this study will be extracted from the RENATES (National Registration of Dissertation and Thesis), which provides access to theses and dissertations defended by students in higher education institutions across Portugal. The focus will be on LIS-related research, specifically master's theses and doctoral dissertations from the past decade (2014–2024). This timeframe allows for a comprehensive analysis of recent trends and developments in LIS education and research within the context of evolving professional and technological demands.

3.1. Data collection procedures

The first step in the methodology involved creating a corpus of LIS theses and dissertations from the RENATES (National Registration of Dissertation and Thesis). The selection process included relevant works that are specifically related to the field of Library and Information Science, ensuring that the data set is focused on research relevant to the professional preparation of LIS graduates. The research papers were identified based on the following criteria: thesis and dissertations from public institutions with the master or doctoral degree offer in LIS, namely: Coimbra University and Évora University (doctoral degree) and Lisbon University, Coimbra University and Open University (master's degree). Once the corpus was created, the analysis proceeded in two phases. The first one corresponding to Quantitative Analysis: The theses and dissertations were categorized into two main groups based on their thematic focus: (1) research aligned with traditional LIS curriculum areas such as information resources management, cataloguing, and user services, and (2) research focused on emerging themes such as data curation, digital preservation, open science, and information ethics. The number of theses within each category was counted, and trends in thematic focus over the past decade were analysed. This provided insights into the overall direction of LIS research in Portugal and the extent to which it aligns with the evolving demands of the profession.

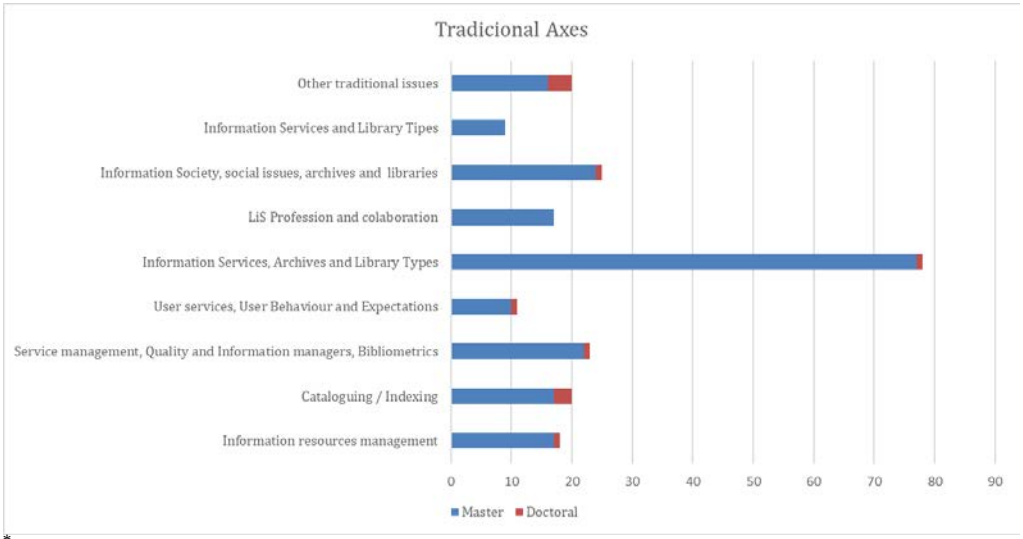
The second phase concerned Qualitative Analysis. A detailed examination of selected theses and dissertations was conducted to assess the depth and relevance of the topics discussed, comparing them with the foundational knowledge areas and emerging themes identified in the ALA and IFLA guidelines. The qualitative analysis will allow for a more nuanced understanding of how these works contribute to the professional development of future LIS practitioners, examining whether the research reflects current challenges and opportunities within the LIS field.

The aim of this methodology is to provide a clear picture of how well the academic research conducted in Portugal aligns with international guidelines for LIS education. The findings will highlight whether LIS programs are addressing both the foundational areas of knowledge essential for the profession, as well as emerging trends in the information landscape. By identifying any gaps or misalignments, the study will offer valuable insights into the curriculum and professional development needs for LIS education in Portugal, contributing to the broader discussion of LIS training worldwide.

4. Results and Discussion

The data was obtained from 18 doctoral thesis and 216 master dissertations (in a total of 302 research results), carried out from 2014 to 2024. The data resulting from this analysis are presented below.

Graphic 1. Thesis and dissertations on Traditional Axes*



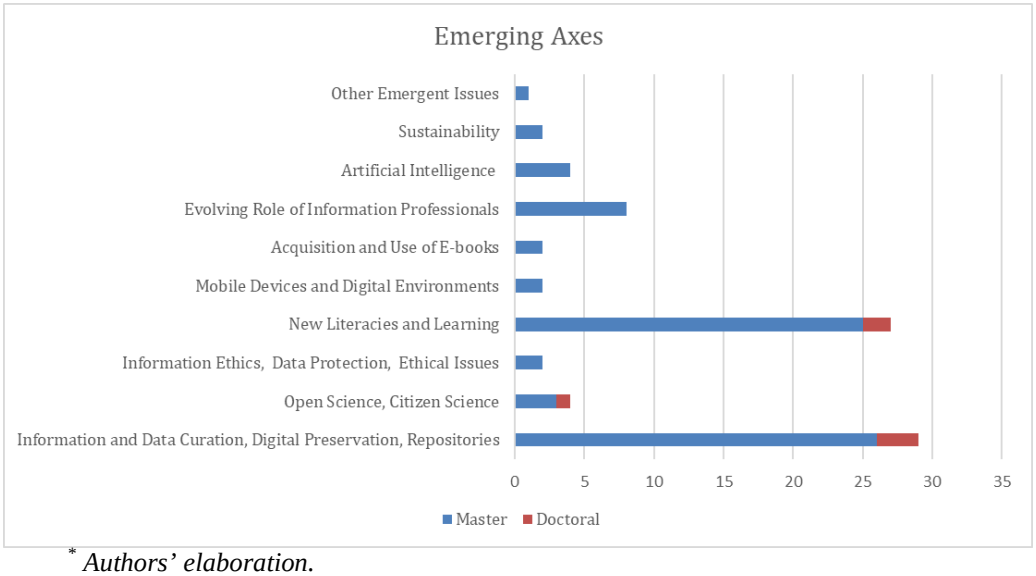
* *Authors' elaboration.*

The data presented in the Graphic 1 reflects the distribution of different study areas within the field of Information Sciences, segmented by academic level (Master's and Doctoral). It is evident that the largest group of professionals was interested in studying "Information Services, Archives, and Library Types," totaling 87 individuals. This remains the most populated study area, indicating a strong academic and professional focus on information management and archival science. "Information Society, Social Issues, Archives, and Libraries" follows with 25 individuals, reinforcing the trend toward broader interdisciplinary studies within information sciences. This suggests a strong interest and concentration of studies in these areas, likely driven by the increasing demand for efficient information management and related services.

Conversely, categories such as "User Services, User Behaviour, and Expectations" and "LIS Profession and Collaboration" continue to display lower numbers. This may indicate that these fields receive less academic focus or have lower appeal to postgraduate students, possibly due to their specialized nature or lower market demand.

The data underscores a strong trend toward information service management and archival science, reflecting a clear preference for well-established and structured fields within the discipline. While there is interest in specific categories, professionals predominantly gravitate toward broader areas focused on data organization and preservation. The recent adjustment in categorization does not alter the overall trends but further reinforces the prominence of general archival and library-related studies.

Graphic 2. Thesis and dissertations on Emerging Axes*



* *Authors' elaboration.*

The data on emerging study areas within Information Sciences, observed in Graphic 2, highlights a growing interest in digital transformation and evolving professional roles. "Information and Data Curation, Digital Preservation, Repositories" leads with 29 professionals across Master's and Doctoral levels, indicating a strong academic and professional focus on managing digital assets and ensuring long-term accessibility. Similarly, "New Literacies and Learning" follows closely with 27, reflecting the increasing relevance of digital literacy and modern educational methodologies.

Other emergent fields, such as "Artificial Intelligence" and "Evolving Role of Information Professionals," show moderate engagement, suggesting that while these areas are gaining attention, they are still developing within academic programs. Meanwhile, categories like "Mobile Devices and Environments," "Acquisition and Use of E-books," and "Sustainability" remain relatively small, possibly due to their specialized nature or evolving market needs.

Overall, the data underscores a clear shift toward digital innovation and ethical considerations in information sciences. While traditional fields continue to dominate, these emerging areas reflect the dynamic changes in technology, access to information, and the evolving responsibilities of information professionals. Their gradual rise suggests an increasing recognition of new challenges and opportunities in the discipline.

The comparative analysis of foundational and emerging study axes between 2014 and 2024 reveals significant shifts in academic focus within the field of Information Sciences. Over the past decade, postgraduate students have predominantly focused on traditional themes, as evidenced by the higher number of master's dissertations and doctoral theses dedicated to foundational areas (221) compared to emerging topics (81). Nonetheless, the growing engagement with newer research fields highlights an increasing recognition of digital transformation and evolving professional challenges within Information Sciences.

Table 1. Comparative results of thesis and dissertations about foundational and emerging axes *

Fundational axe		***Emerging axe***	
Information resources management	18	Information and Data Curation, Digital preservation, Repositories	29
Cataloguing and Indexing	20	Open Science, Citizen Science	4
Service management, Quality and Information managers, bibliometrics	23	Information ethics, data protection, ethical issues	2
User services, User Behaviour and Expectations	11	New Literacies and Learning	27
Information Services and Library Types	87	Mobile Devices and Digital Environments	2
LIS Profession and colaboration	17	Acquisition and Use of E-books	2

Information Society, social issues and libraries	25	Evolving Role of Information Professionals	8
Other traditional issues	20	Artificial Intelligence	4
		Sustainability	2
		Other Emergent Issues	1
Totals	221		81

[*] *Authors' elaboration.*

Traditional areas such as "Information Services and Library Types" (78 professionals) and "Service Management, Quality and Information Managers, Bibliometrics" (23 professionals) continue to hold substantial relevance, reflecting their enduring importance in information management and library sciences. However, the rise of digital-focused fields, particularly "Information and Data Curation, Digital Preservation, Repositories" (29 professionals) and "New Literacies and Learning" (27 professionals), suggests a growing emphasis on data stewardship and evolving literacy needs in the digital era.

The emerging axes indicate an increasing concern for interdisciplinary and technologically driven themes. Fields such as "Artificial Intelligence" (4 professionals) and "Evolving Role of Information Professionals" (8 professionals) signal a shift toward automation and the transformation of professional responsibilities within the discipline. Meanwhile, niche topics like "Mobile Devices and Digital Environments," "Acquisition and Use of E-books," and "Sustainability" remain relatively minor, likely reflecting specialized research interests rather than widespread academic or professional engagement.

Overall, the data illustrates a gradual evolution from conventional information management toward digitally oriented and ethically complex study areas. While foundational disciplines remain dominant, the emergence of data-driven and technologically adaptive fields highlights an academic transition aligning with broader societal and technological changes. This trend suggests that future research and professional development will increasingly prioritize digital preservation, literacy transformation, and the ethical dimensions of information science.

5. Conclusions

This study was framed within a structured methodological approach that combined both quantitative and qualitative analyses, ensuring a comprehensive examination of thematic trends in LIS education. By systematically categorizing master's dissertations and doctoral theses based on established and emerging curricular themes, the research provided a comparative perspective on the evolution of academic focus in Portugal, between 2014 and 2024. The selection of RENATES as the primary data source allows for an extensive review of scholarly outputs, facilitating insights into the alignment of LIS education with evolving professional demands. The study's methodological rigor ensures the reliability of findings, contributing to a broader understanding of how LIS curricula adapt to technological advancements and societal shifts.

In conclusion, the evolution of Library and Information Science (LIS) education reflects a dynamic interplay between traditional academic foundations, and emerging technological and societal demands. The comparative analysis of master's and doctoral research within LIS programs in Portugal demonstrates that while established fields such as information resources management, cataloguing, and library services continue to dominate, there is a growing academic engagement with digital preservation, open science, and the evolving role of information professionals. The findings underscore the importance of adapting curricula to ensure that LIS professionals are equipped to navigate complex digital environments while maintaining core competencies in information organization and management. As technological advancements redefine professional roles, interdisciplinary approaches and ethical considerations are increasingly integral to LIS education. The study highlights the necessity of balancing foundational knowledge with innovation, advocating for international collaboration to align academic training with global trends. Ultimately, the progression of LIS education should embrace both continuity and transformation, preparing professionals to address contemporary challenges in a rapidly evolving information landscape. One limitation of this study is the broad temporal scope, which does not allow for a fine-grained analysis of annual trends in postgraduate research. Future studies could adopt a longitudinal approach, examining variations in thematic focus year by year to better understand the progressive evolution of LIS education and its responsiveness to emerging academic and professional demands.

Beyond its academic contributions, this research carries significant social implications, as LIS professionals play a critical role in managing information access, digital literacy, and ethical considerations in an increasingly data-driven world. By highlighting the intersection of foundational knowledge and emergent topics, the study underscores the need for continuous curricular adaptation, promoting well-rounded expertise among future information specialists. Furthermore, its emphasis on international collaboration fosters knowledge exchange and best practices, ultimately strengthening the global development of LIS education and its societal impact.

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