

# Peculiarities and trends in doctoral research in the Republic of Moldova in the light of the bibliographical references of theses

**Gheorghe Ciucureanu**

Dr. Habil.

*Information Society Development Institute, National Agency for Quality Assurance in Education and Research*

*Chisinau, Republic of Moldova*

Email [gheorghe.cuciureanu@idsi.md](mailto:gheorghe.cuciureanu@idsi.md)

**Valentina Donici**

PhD(c)

*State University of Moldova, Doctoral School of Social Sciences and Education*

Email [donici.valentina@gmail.com](mailto:donici.valentina@gmail.com)

## **Abstract:**

*This study investigates the trends and peculiarities of doctoral research in the Republic of Moldova through an analysis of bibliographical references in doctoral theses from 2005 and 2023. Aiming to understand the features and evolution of citation practices, the study examines 375 theses available in national databases. The research addresses the quantity, nature, and language of citations, revealing significant findings. It shows an increase in the average number of references per thesis over time, indicating heightened scientific rigour and comprehensive literature integration. Differences across scientific fields are noted, with history and political science theses having the most references and computer science and physical-mathematical sciences the fewest. The analysis finds that scientific publications dominate the references, though other sources are important in some socio-humanities fields. Language trends indicate a shift from Russian to English references, reflecting increased global integration. The study also highlights the correlation between the thesis language and the predominant language of references used. These insights can be useful for policymakers, researchers, and academic institutions in understanding and improving the quality and impact of doctoral research in Moldova.*

**Keywords:** *bibliographical reference, doctoral thesis, bibliometric analysis, Republic of Moldova*

## **1. Introduction**

The analysis of bibliographic references from the end of a scientific paper, i.e., citations, represents a relevant bibliometric study for understanding and evaluating the impact and relevance of scientific research. It is useful for understanding the characteristics and trends of scientific publication, relationships between research topics, the most important journals and conferences on a

specific subject, differences between scientific fields, and other aspects of the scientific process. Such a bibliometric study is based on the principle that the effective use of bibliographic sources in a scientific paper, including a doctoral thesis, is an indication of their relevance to the respective research, and therefore their analysis can produce useful and relevant empirical data.

The study of sources used in a paper helps us establish its scientific rigour, the quality of the literature used, the author's original contribution, and adherence to scientific ethics, as it indicates the sources on which the work is based (high-quality sources can indicate high-quality research) and we can see how the declared scientific novelty fits into the specialized literature.

The data obtained from the analysis of references help to establish scientific networks between researchers and scientific specialities, monitor research trends including the evolution and emergence of new directions, evaluate the impact of research, etc. Based on this information, evidence-based science policies can be developed, including resource allocation and the prioritization of scientific specialities/fields.

The study of bibliographic references is particularly important in the field of librarianship, as it helps to analyse resources to determine the actual use of documents, providing libraries and information system developers with ideas for acquiring important documents and planning products and services, and is also useful in identifying materials that are related to a particular topic that are worth reading (Roy et al. 2021).

In this context, the analysis of citations in doctoral theses is important because these are complex, fundamental scientific works that present in detail all elements of scientific research, including an in-depth analysis of the scientific literature on the researched subject, written for the purpose of recognizing individuals as qualified researchers, and for advancing scientific knowledge.

## 2. Literature review

Studies on bibliographical references (citations) of doctoral theses are quite common in the literature. They vary in terms of the number, field, and period of thesis defence but especially in the way citations are analysed. Most studies focus on the analysis of the types of cited publications and the number of their authors.

In a study of 61 doctoral theses in library and information science, Buttlar (1999) highlighted a strong preference for journal articles over books and other types of publications. Approximately 80% of citations were to single authors, with a notable gender disparity in favour of male authors (61%). This study also highlighted the interdisciplinary nature of library and information science, significantly influenced (according to citations) by education, computer science, medicine, psychology, communication, and business. In the chemistry, Gooden (2001) analysed Ohio State University doctoral dissertations from 1996-2000. He determined that only 12 journals are needed to cover 50% of the bibliographic references and that the majority of citations are articles published in scientific journals. The same situation, with journal articles predominating among references, was found in botany - 74.8% citations (Banateppanvar et al. 2013) and overall in biological sciences (Walcott 1994).

Focusing on citation policy, Afful and Janks (2013) analysed doctoral theses in various fields and found that books are preferred in social sciences and humanities, while journal articles are preferred in other sciences. Overall, books were most cited (34%), followed by journal articles (24%) and book chapters (12%). Single authors predominate in social sciences and humanities, while multiple authors are more frequent in the other fields. In total, 67% of cited sources have multiple authors. This study also noted the predominance of recent papers in citations across all

science fields (except the humanities, where old material is widely used), but also the low citation of other doctoral theses.

A research analysing citation evolution in doctoral theses was conducted by Knapp (2013). He compared 20 doctoral theses in political science defended at Penn State University between 1953-1968 and 2005-2010, finding an increase in the proportion of journal article citations over time, consistent use of books, and a decline in the use of government documents, newspapers, and archival materials. These changes reflected a shift from humanities to a more social sciences-based approach.

Singh, Bebi, and Garg (2014) analysed social science doctoral dissertations from the University of Delhi for the period 1995-2008. Their study found that books were the most cited sources (55.5%) except in economics where journal articles were more prevalent. Single-authored papers dominated the citations (86%) and the most cited period was between 1991 and 2000. The predominance of books as the main source for doctoral theses in sociology was previously established by Zafrunnisha (2012), after analysing 9162 citations from 77 doctoral theses. Other fields of science for which books have been shown to predominate as a main source for doctoral theses include philosophy (Herubel 1991), musicology (Kuyper-Rushing 1999), political science, and psychology (Kushkowski et al. 2003).

An analysis published in the same year (2014) showed that books were still highly cited in doctoral dissertations in the Spanish and Portuguese Department at Rutgers University in New Jersey in both the humanities and social sciences. Another important finding was that doctoral students in these fields tended to favour open access journals, which might indicate that they did not know how to navigate the library's paid resources (Gasparotto 2014).

Schadl and Todeschini (2015) examined the languages and citation formats of doctoral theses on Latin American studies at the University of New Mexico. They found that the 179 theses contain 26,483 citations, of which 16,981 (64%) refer to books and/or book chapters and 9,532 (36%) to journal articles; English-language materials predominate, with 22,511 citations (85%), followed by Spanish (14%) and Portuguese (1%).

In a study devoted to citations in 53 economics PhD theses, Mondal and Roy (2018) find several features concerning this field of science, previously highlighted for this domain in general studies on social sciences. Thus, the analysis revealed that journals were the most cited documents (50.1%), followed by books (26.6%), and single-authored articles were cited more than multi-authored articles.

Citation patterns in social sciences and humanities doctoral theses at a STEM university were analysed by Burrows et al. (2019) based on work defended at Purdue University. The study found that, while journal collections met the needs of the social sciences, the humanities, which are more reliant on books, were less well supplied with the needed information from these collections. Overall, Purdue libraries hold 76% of bibliographic sources used in the humanities and 84% in the social sciences.

In a more recent study, Roy, Biswas, and Modak (2021) examined doctoral theses from ICFAI University of Dehradun, focusing on 8979 citations from 23 theses submitted between 2012 and 2020. The study found a clear preference for journals and books as sources of information, with a significant predominance of foreign authors (59.65%) over Indian authors (40.35%). The majority of the cited publications were from the U.S. and U.K. The study also found problems with the writing of bibliographical references (non-compliance with citation standards, omission of metadata, etc).

In the same year, a group of authors published a study of 172 PhD theses in design from Portugal defended between 2005 and 2019, to see the impact of previous doctoral studies. The

results reveal few connections between doctoral studies and little overlap between them, thus indicating low continuity and reproducibility of national doctoral work and a low tradition of citing doctoral theses (Costa et al. 2021).

The analysis of journal use as sources in sociology was conducted by Woods (2024) based on 104 sociology theses from Pennsylvania State University defended in 2010-2021. The analysis of 10,395 journal citations identified the core journals used by doctoral students, with significant variation in journal use across different sociology programs.

Our study aims to extend the knowledge in the field of bibliometric analysis of bibliographical references in doctoral theses in the following ways: a first analysis for the Republic of Moldova and this part of Europe, focusing on the language structure of references and on the comparing sources used over a period of nearly two decades.

### 3. Literature review

For the study, doctoral theses defended and confirmed by the authorized authority in the field in two years far apart (about two decades) were selected to be able to compare differences and see the evolution of bibliographic source usage in doctoral theses from the Republic of Moldova. The consulted theses were those posted on the websites of the National Council for Accreditation and Attestation (CNAA) - <http://www.cnaa.md/theses/> and the National Agency for Quality Assurance in Education and Research (ANACEC) - <https://anacec.md/ro/technical-staff/evaluations>. In the Republic of Moldova, doctoral dissertations have been posted online, for access by all those interested, since 2004. The choice of specific years for analysis was determined by the following factors:

- 2005 – the first year all theses were posted in electronic format on the CNAA website;
- 2023 – the latest available year when all theses were posted in electronic format on the CNAA and ANACEC websites.

In total, 375 doctoral theses with full text and bibliography at the end of the thesis were identified and found, including 186 theses for which the CNAA approved scientific titles in 2005 (the number of scientific titles in that year was higher, but some habilitated doctoral titles were awarded for synthesis works and not theses, and for some approved doctoral titles, only the abstracts were found, not the full text of the theses) and 189 theses for which the ANACEC approved scientific titles in 2023.

The data extraction from the electronic version of the doctoral theses was done manually, as the national authority's websites for confirming scientific titles do not list bibliographic references separately. According to the [Guide for Writing the Doctor / Doctor Habilitated Thesis](#), "the bibliography will list all sources of information used in writing the thesis". Therefore, since the bibliography must include only cited sources, we will consider the bibliography list at the end as the citation list, and the terms references, sources, and citations will be used interchangeably.

The 375 doctoral dissertations under analysis were divided by several characteristics:

- Type of work: doctoral (341 theses) and habilitation (35);
- Author's gender: women (209) and men (166);
- Author's country: 10 countries, mostly from the Republic of Moldova (288) and Romania (72);
- Language of the thesis: Romanian (334), Russian (32), English (9);

- Scientific field: 22 fields, mostly in educational sciences (71), medical sciences (65), law (51), and economic sciences (42);
- Institution where the defence took place: 32 institutions, mostly at the Moldova State University of Moldova (105), State University of Medicine and Pharmacy “Nicolae Testemițanu” (56), State Pedagogical University ”Ion Creangă” in Chișinău (36), and the State University of Physical Education and Sport (32).

All these served as criteria for analysing bibliographic references. It should be noted that in 2005 and 2023, there were different nomenclatures for scientific fields/specialities. In our study, we used the 2005 nomenclature, with some field names adjusted to the 2023 nomenclature, using an abbreviated name in figures (e.g., instead of engineering sciences – engineering).

In the analyses conducted, we focused on the following three aspects of bibliographic references:

1. Their number;
2. Their nature – all sources used in theses were divided into three groups: scientific publications, normative acts (we separated this type considering that many theses in social sciences often use normative acts as sources), and other sources (literary works, folklore texts, observation data, dictionaries, archival data, patents, web pages, survey data, standards, statistical collections, etc.);
3. The language in which the reference was published – they were divided into four groups: Romanian, Russian, English, and other languages (French, German, Italian, etc.).

Additionally, an original aspect of the study was the comparative analysis of references in theses from 2005 and 2023, in order to try to observe the evolution over time of the above characteristics.

## 4. Results and discussion

### 4.1. Number of references

A total of 86,028 bibliographic references were identified, with an average of 229 per doctoral thesis. However, there are significant differences between theses. For instance, there are 8 theses with fewer than 100 bibliographic references and 10 theses with more than 500 bibliographic references. The theses with the fewest references are: “Developing Knowledge Competencies at the First Grade Pupils through Integration of Curriculum Content” (41 references), “Mathematical Models and Program Products in District Management” (46), and “Study of Electronic and Irradiation Processes in Gold-Doped Zinc Selenide Monocrystals” (58). In contrast, the theses with the most references are: “The Russian Federation in the Context of Contemporary International Political Processes” (820), “The Habitat of Late Bronze Age Communities in the Carpatho-Niprean Space (Noua-Sabatinovka-Coslogeni Cultural Complex)” (729), and “Criminological Victimology: Theoretical, Methodological, and Applied Issues” (695). Comparing the two years, the average number of bibliographic references used in a doctoral thesis increased from 220 (2005) to 239 (2023).

As expected, a habilitated doctoral thesis includes more citations (387) than in a PhD thesis (214), because the former is considered a product of more advanced scientific research, which "contains fundamentally new results for science and practice, which determine the solution of a complex scientific problem of major importance" (Methodology for Granting and Confirming Scientific Titles – Government Decision 497/2019). However, the difference between the number of references used in the two types of theses decreased from 200 (in 2005) to 145 (in 2023). It would

be interesting to analyse, in this context, whether other aspects (amount of data used, depth of analysis, methodology used, etc.) also show a convergence between these types of theses. We can assume that this development is also related to the fact that the procedure for defending of doctor habilitated theses was greatly simplified in 2018 by the Regulation on the Organization and Conduct of Postdoctoral Programs (Government Decision 499/2018), allowing any higher education and research institution to organize postdoctoral programs without criteria or mechanisms for accrediting institutions for organizing these programs in specific scientific fields/specialities. It is no coincidence that the academic community perceives a decline in the quality of habilitation theses.

The highest number of bibliographical references are recorded in history and political science, while the lowest in computer science and physical-mathematical sciences (Fig. 1). Overall, there are 10 scientific fields (out of the 22 fields in which titles have been confirmed) where theses have, on average, less than 200 references.

There are significant differences in some scientific domains in the average number of bibliographic references in theses from 2005 and 2023. Thus, the number of bibliographical references decreased in chemistry theses by 288 and in agricultural sciences - by 113. However, in both cases, the number of theses was too small to draw definitive conclusions, primarily because in 2005 there were doctor habilitated theses in the 2 fields (one out of 3 in agricultural sciences and the only thesis in chemistry). However, we note that the average number of bibliographic references to doctoral theses in chemistry in 2023 is only 127. Nevertheless, it is noteworthy that the average number of bibliographic references in doctoral theses in chemistry in 2023 is only 127.

By institution, the highest number of references is found in theses defended at the Institute of Philosophy, Sociology, and Law and the Institute of Cultural Heritage, while the lowest is at the Institute of Applied Physics and the Academy of Music, Theatre, and Fine Arts (Fig. 2).

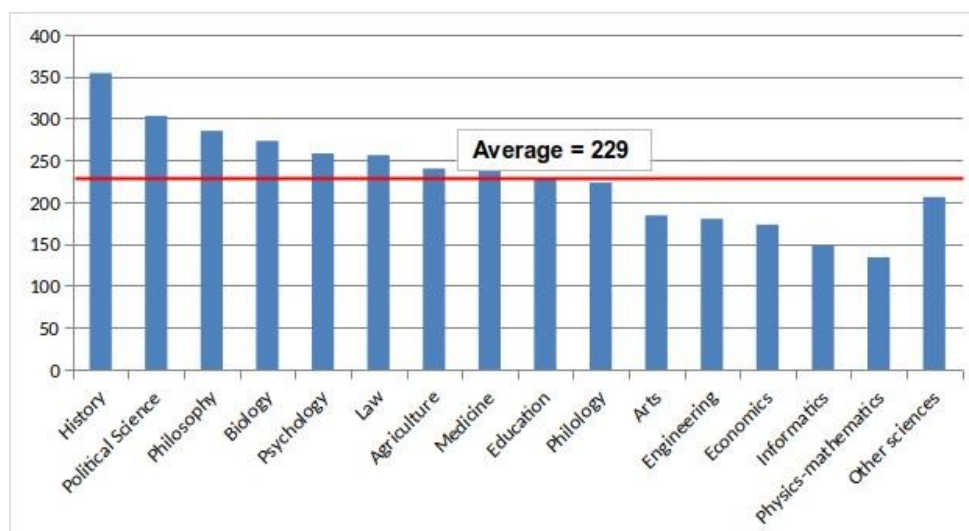


Figure 1. Average number of bibliographical references in doctoral theses from 2005 and 2023 according to scientific fields

Note: other science includes fields of science in which less than 5 theses have been defended

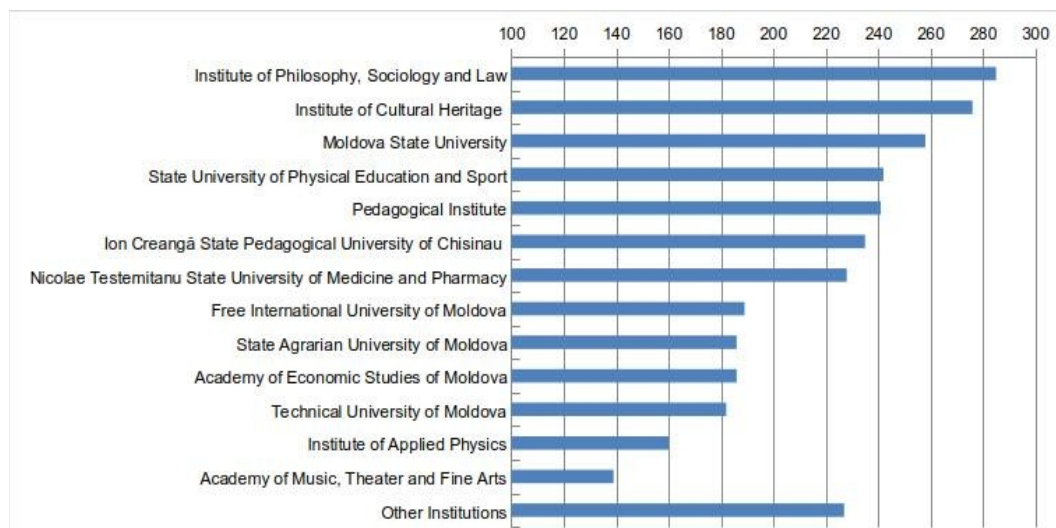


Figure 2. The average number of bibliographical references to doctoral theses from 2005 and 2023 according to the institutions where they were written

Note: other institutions includes institutions in which less than 5 theses have been defended

Generally, there is a good correlation between the average number of references at an institution and the scientific fields in which theses are defended at that institution. For example, at the Moldova State University, where theses are defended almost in all fields of sciences (105 theses in the analysed period), with the predominance of some social sciences (law - 30 theses, political sciences - 11, education sciences - 9) and humanities (philology - 13 theses, history - 8, philosophy - 7), the average number of references is higher than the average by almost 30. In contrast, at the

Technical University of Moldova, where theses are predominantly defended in engineering sciences, physical-mathematical sciences, economics and informatics (11 out of 18 theses in the analysed period), the average number of references is lower than the average by almost 50. An exception to this rule is the Institute of Cultural Heritage and the Academy of Music, Theatre and

Fine Arts (AMTAP), which have a similar profile of theses defended, however, the average number of references per thesis is higher in the former institution than in the latter. One explanation is that at AMTAP, following the modification of the regulatory framework in 2014, professional doctoral theses began to be defended (six in 2023), which have fewer bibliographical references. Based on this case, we might also assume that that in theses defended in research institutes, the number of references is higher than in those defended in higher education institutions. However, in other cases, this assumption does not hold. Thus, the average number of citations in theses defended at the State University of Medicine and Pharmacy “Nicolae Testemitanu” (228 citations per thesis) is close to that in theses defended at medical research institutes (232 citations per thesis).

Women use fewer bibliographical references than men - 223 compared to 238. This happens despite the fact that women have defended more doctor habilitated theses (60%), which cite more sources, or that men predominate in some scientific fields with fewer citations, e.g. informatics (80% men). However, the difference is not so significant enough to speak of a rule, especially since in the theses from 2023 this difference was reduced to just seven references.

The most bibliographical references are used by citizens of Belarus, explained by the fact that one of the two defended theses is a habilitation thesis in political sciences (a field with a high number of references), followed by those from the Republic of Moldova, who do not exceed the average by much. The fewest bibliographical references (under 175) are found in theses produced

by citizens of Jordan, Syria and Turkey (in the latter two countries, however, there is only one thesis each).

According to the language in which the theses are written, there are no significant differences regarding the average number of bibliographic references per thesis. We note, however, that while the number of references per thesis has increased over time in theses written in Romanian (324 theses) and English (9), the number of references in theses written in Russian has decreased from 243 in 2005 (average references from 14 theses) to 220 in 2023 (average references from 18 theses). The case of theses in Russian can be explained by the scientific field (e.g., in 2005 there were 4 theses in political sciences, and in 2023 – none) and the type of thesis (in 2005 there were 2 doctor habilitated theses, and in 2023 – none).

#### 4.2. Nature of references

Out of the total references in doctoral theses from 2005 and 2023, scientific publications constitute 89%, normative acts – 5%, and other sources – 6%. The high proportion of normative acts is explained by the large number of theses defended in law in the Republic of Moldova.

These figures do not differ significantly between doctoral and habilitation theses. However, there are significant differences between fields, with the proportion of scientific publications exceeding 90% of total sources in 12 fields and being below 80% in 10 fields. Fields with the highest proportions of scientific publications out of total sources used are chemical sciences, biological sciences, physical-mathematical sciences, engineering, agricultural, and medical sciences.

Normative acts are most frequently used in law doctoral theses (20% of total references), followed by administrative sciences (17%), sociology and political sciences (both 10%), pharmacy (9%), and economic sciences (7%). Fields with high proportions of other sources besides scientific and normative ones include military sciences and geography (over 17% of total), which include cartographic sources, observation data, dictionaries, etc.; philology (15%) with many citations of literary works; pharmacy (13%) due to a thesis on drug authorization citing guidelines, instructions, and the like; economic sciences and administrative sciences (both also 13%); history (9%) with many citations of archival sources; art studies (7%) with citations of art works.

Comparing the nature of references by institution shows that only in 3 of them does the percentage of citing scientific publications in doctoral theses fall below 80%. The proportion of normative acts is high especially in theses from institutions where many law theses are defended – "Ștefan cel Mare" Academy of the Ministry of Internal Affairs (26%), Institute of Philosophy, Sociology and Law (17%), Free International University of Moldova (16%), European University of Political and Economic Studies "Constantin Stere" (9%).

There are no significant differences in the proportion of scientific publications among references in theses written by men and women, but certain differences are observed in the use of the other 2 groups of sources. Thus, men more frequently use normative acts (8% of total sources compared to 3% for women), which is explained by the predominance of men in fields where normative acts are more frequently cited (e.g., law), while women more frequently use other sources (7% of total compared to 5% for men), likely due to the predominance of women in philology, art studies, and other fields with wide use of tertiary sources.

No relevant differences can be observed in the proportion of source groups used by the citizenship of individuals who wrote theses or the language in which the thesis is written. The observed differences show the same correlation previously observed between scientific fields and types of sources used.

### 4.3. Language of References

Most references in doctoral theses from the Republic of Moldova in 2005 and 2023 are in Romanian (about 40% of total), followed by English (30%), Russian (25%), and others (5%). Among other languages, French references are most frequent. Comparing the figures for the two years included in our study, we observe a decline in references in Russian – from 35% (2005) to 17% (2023) and an increase in references in English – from 20% (2005) to 39% (2023).

In doctor habilitated theses, Russian references predominate (32% of all sources), while in doctor theses, Romanian references predominate (41%). This difference is somewhat surprising and difficult to explain, given that the proportion of theses written in Russian is higher for doctoral candidates (17%) than for habilitation candidates (9%), but also the field structure of doctor habilitated theses (medical sciences – 44%, educational sciences – 12%, law – 9%, etc.). The proportion of English sources is closer for both types of theses (30% for doctor and 29% for doctor habilitated theses), even though doctor habilitated theses are considered more advanced research and should be more integrated into the international science circuit, consequently having a higher proportion of citations of English sources, the "lingua franca" of science.

However, we note spectacular changes in the structure by language of references in doctor habilitated theses in recent decades: compared to the 18 doctor habilitated theses from 2005, the 16 habilitation theses from 2023 cited 27% more sources in English, 18% more sources in Romanian, and 36% fewer sources in Russian (as a proportion of total sources).

Romanian is the main language of bibliographic references in doctoral theses in over half of the scientific fields in which titles of doctor and habilitated doctor have been approved, with military sciences, philosophy, and educational sciences having over 60% references in theses in this language (Figure 3). On the other hand, there are 4 fields in which Romanian bibliographic references in theses constitute less than 10%.

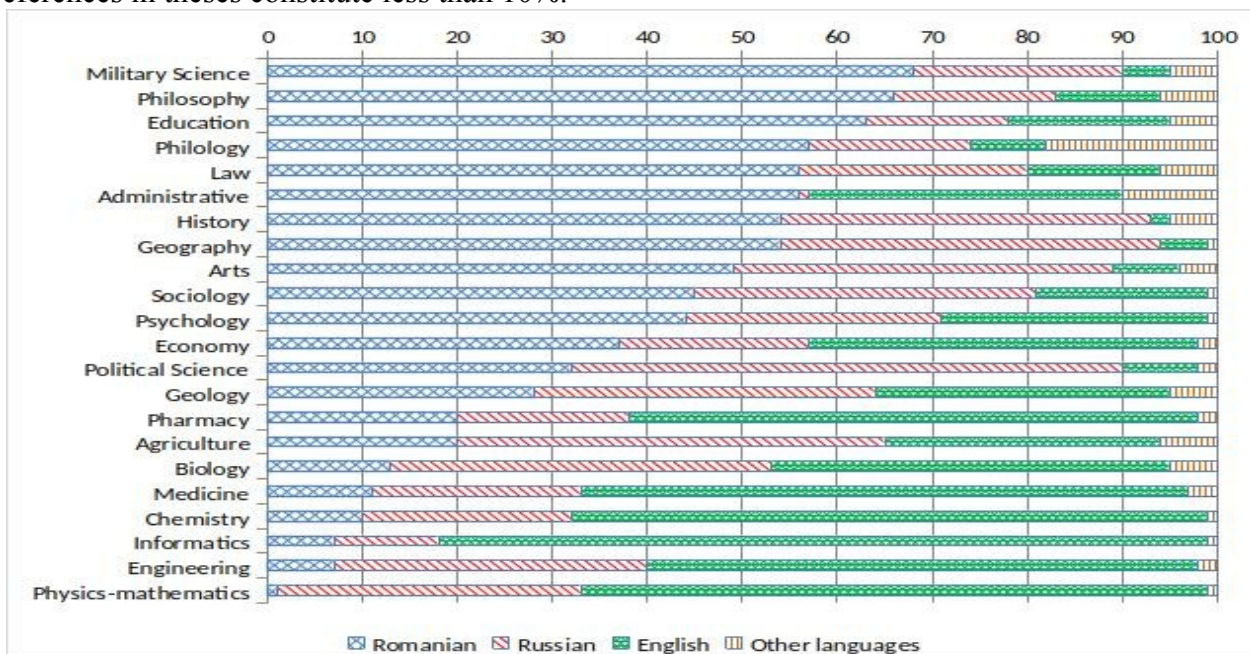


Figure 3. Language of bibliographic references in doctoral theses from 2005 and 2023 according to scientific fields

In two fields, the majority of sources used in theses are in Russian – political sciences (58% of total) and geology (36%). In the latter case, this is explained by the fact that many studies on the geology of the Republic of Moldova are in Russian, and the only thesis defended in the field refers to the northern part of the Prut-Dniester interfluvium. In the case of political sciences, which is the only field with over 50% sources used in Russian, the situation is more debatable. The fact that many sources are from Russia, where there is no freedom of creation, especially in socio-human sciences, and they are more or less connected to the official propaganda of a non-democratic regime, could suggest that some researchers in the field from the Republic of Moldova accept the views promoted in that state, which are in contradiction with scientific approaches and the national interests of the Republic of Moldova. Another 5 scientific fields are strongly "Russified" in the sense that the proportion of bibliographic references in this language is very high, constituting 40-45%. This proportion is explained by traditional connections to post-Soviet space research (agricultural and biological sciences, art studies) and the existence of significant sources regarding the territory of the Republic of Moldova in Russian (history, geography).

English references predominate in theses from 8 fields, with over 50% in 6 of them, including the field with the second highest number of theses defended – medicine. The highest proportion is in computer science, explainable by the development of this field, followed by sciences that publish extensively in journals included in Web of Science and Scopus – chemistry, physical-mathematical sciences, and engineering sciences. There are also 2 fields where the predominance is relative – biological sciences and economic sciences.

References in other languages are more frequent in philology, the only field where their proportion exceeds 15%, explainable by the existence of studies on French literature, followed by 7 other fields with proportions of these sources between 5-10%.

Analysing the references in theses separately by year, we find that in 2023, Romanian predominates in 8 fields (including 2 with over 50% references), English – in 8 fields (including 2 with over 90% and 5 with over 50%), and Russian – in 5 fields (including 2 with over 50%).

Institutions with the most references in Romanian in doctoral theses are the Institute of Literature and Folklore, the Institute of Linguistics, and the Institute of Pedagogy, with over  $\frac{3}{4}$  of total references, followed by 5 other institutions where the proportion of these references exceeds 50%. The most "Russified" institutions are "Alec Russo" State University of Bălți, Botanical Garden, "Chiril Draganiuc" Institute of Phthisiopneumology, Scientific-Practical Institute of Biotechnologies in Zootechnics and Veterinary Medicine, Institute of Geography, and Institute of Physiology and Sanocreatology, all with a proportion of Russian sources in doctoral theses over 60%, with 2 other institutions having the same proportion exceeding 50%. The most "Anglicized" institutions are the Institute of Cardiology (over 90% of bibliographic references in English) and the

Institute of Mathematics and Informatics (over 80%), followed by the "Nicolae Testemițanu" State University of Medicine and Pharmacy, Institute of Plant Physiology, Institute of Oncology, Institute of Applied Physics, Mother and Child Institute, and Technical University of Moldova (with proportions in the 60-68% range).

Regarding gender, there are no major differences in the language of bibliographic references used, but as a matter of curiosity, women use Romanian sources more frequently than men, while men use Russian and English sources more frequently.

Romanian predominates in the bibliographic references of doctoral theses written by Romanian (69%) and Moldovan (34%) citizens, Russian – by citizens of Ukraine and Belarus (over 80% in both cases), Turkey and Jordan (about 48% in both cases), while English – by citizens of Israel and Palestine (over 80% in both cases), Syria and Russia (about 65% in both cases).

However, it should be noted that for the last 3 countries mentioned, only one thesis was defended during the analysed period.

There seems to be a strong correlation between the language in which the thesis is written and the predominant language of bibliographic references. Thus, in theses written in English, bibliographic references in the same language predominate (80% of references used), in theses written in Russian – references in that language (68%), and in theses written in Romanian – references in Romanian (44%). Interestingly, in theses written in English, the proportion of references in Russian is the lowest (0.3%), while the proportion in other languages is the highest (13%), suggesting that the authors of these theses have used a wider variety of sources from different languages.

## 5. Conclusions

The analysis of citations in doctoral theses is considered a very useful bibliometric method for obtaining data on trends in scientific publishing, relationships between research subjects, and the quality and rigour of scientific works.

This study included the analysis of 375 doctoral theses from the Republic of Moldova, focusing on the number, nature, and language of bibliographic references. The results provide a detailed and relevant picture of the characteristics and trends in doctoral scientific research in the Republic of Moldova, with the main findings being as follows:

- An increase in the average number of bibliographic references per doctoral thesis, suggesting an increase in scientific rigour and broader integration of specialized literature into theses;
- Significant differences in the characteristics of references between fields, with the most references recorded in theses from history and political sciences, and the fewest in computer science and physical-mathematical sciences. This likely reflects the complexity and interdisciplinary nature of certain fields compared to others;
- Predominance of scientific publications among bibliographic references, with a significant proportion of other sources in some socio-human fields;
- Predominant use of references in Romanian, alongside the observed trend over time of a decrease in references in Russian and an increase in those in English, indicating a shift towards international literature and greater integration into the global scientific circuit;
- A large proportion of English sources in the fields and institutions well integrated into the scientific circuit, publishing in journals from the most important international databases;
- Significant influence of the language in which the thesis is written on the language of bibliographic references used.

These findings help us better understand the trends and citation practices in doctoral theses and, in this sense, can be useful to those involved in doctoral research, including doctoral supervisors and authorities responsible for developing scientific and educational policies in the Republic of Moldova.

## References

Afful, J.B., and Janks, H. (2013) 'The politics of citation: An analysis of doctoral theses across the disciplines', *CADAAD Journal*, 6 (2): 193-211, available:

[https://www.lancaster.ac.uk/fass/journals/cadaad/wp-content/uploads/2015/01/Volume-6\\_Afful-Janks.pdf](https://www.lancaster.ac.uk/fass/journals/cadaad/wp-content/uploads/2015/01/Volume-6_Afful-Janks.pdf) [accessed in August 2024]

Banateppanvar, K., Biradar, B. S., and Kannappanavar, B. U. (2013) 'Citation analysis of doctoral theses in Biotechnology submitted to Kuvempu University, Karnataka: A case study', *International Journal of Information Dissemination and Technology*, 3 (3): 147-157, available:

<https://www.proquest.com/docview/1707789830?sourcetype=Scholarly%20Journals> [accessed in August 2024]

Burrows, T., Freeman, R.S., Heyns, E.P., and Hérubel, J.V. (2019) 'Humanities and Social Sciences Dissertation Bibliographies and Collections: The View from a STEM University', *portal: Libraries and the Academy*, 19: 511- 533, available: [https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1268&context=lib\\_fsdocs](https://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1268&context=lib_fsdocs)

Buttlar, L. (1999) 'Information sources in library and information science doctoral research', *Library & Information Science Research*, 21: 227-245, available:

<https://www.sciencedirect.com/science/article/abs/pii/S0740818899000055> [accessed in August 2024]

Costa, N., Costa, R.M., Borges, A., Branco, V.A., Cunca, R., Modesto, A., and Silva, A.C. (2021) 'Mapping the Research Thread of PhDs in Design: A PhD Citation Analysis of the Portuguese Doctorates', *Design for Tomorrow—Volume 2. Smart Innovation, Systems and Technologies*, vol 222. Springer, Singapore. [https://doi.org/10.1007/978-981-16-0119-4\\_17](https://doi.org/10.1007/978-981-16-0119-4_17)

Gasparotto, M. (2014) 'A Ten Year Analysis of Dissertation Bibliographies from the Department of Spanish and Portuguese at Rutgers University', *Collection Building*, 33 (3): 86–89.

<https://doi.org/10.1108/CB-03-2014-0017>

Gooden, A. M. (2001) 'Citation Analysis of Chemistry Doctoral Dissertations: An Ohio State University: A case Study', *Issues in Science and Technology Librarianship*, (32).

<https://doi.org/10.29173/istl1865>

Herubel, J.-P. V. M. (1991) 'Philosophy Dissertation Bibliographies and Citations in Serials Evaluation', *The Serials Librarian*, 20 (2–3): 65-73. [https://doi.org/10.1300/J123v20n02\\_06](https://doi.org/10.1300/J123v20n02_06)

Knapp, J.A. (2013) 'Tracking Changes in Political Science Dissertations at Penn State: 1953–2010', *Behavioral & Social Sciences Librarian* 32 (3): 155–75.

<https://doi.org/10.1080/01639269.2013.817881>

Kushkowsky, J.D., Parsons K.A. and Wiese. W.H. (2003) 'Master's and doctoral thesis citations: Analysis and trends of a longitudinal study', *Libraries and the Academy* 3 (3): 459-479.

doi:10.1353/PLA.2003.0062

- Kuyper-Rushing, L. (1999) 'Identifying uniform core journal titles for Music libraries: A dissertation citation study', *College & Research Libraries*, 60 (2): 153–163.  
<https://doi.org/10.5860/crl.60.2.153>
- Mondal, S., and Roy, B.K. (2018) 'Research trends of sub-subjects on Economics: a bibliometric study', *Library Philosophy and Practice (e-journal)*, 1930, available:  
<http://digitalcommons.unl.edu/libphilprac/1930> [accessed in August 2024]
- Roy, T., Biswas, R., and Modak, S. (2021) 'Citation Analysis of Doctoral Theses in Science and Social Sciences Submitted to ICFAI University, Dehradun during 2012 – 2020', *Library Philosophy and Practice (e-journal)*. 5339, available: <https://digitalcommons.unl.edu/libphilprac/5339> [accessed in August 2024]
- Singh, K. P., Bebi, , and Garg, K. C. (2014) 'Citation Analysis of Ph.D. Theses Submitted to the University of Delhi in Social Sciences During 1995-2008', *Journal of Information and Knowledge*, 51 (6): 363–368. <https://doi.org/10.17821/srels/2014/v51i6/57073>
- Schadl, S.M., and Todeschini, M (2015) 'Cite Globally, Analyze Locally: Citation Analysis from a Local Latin American Studies Perspective', *College & Research Libraries*, 76 (2): 136–49.  
<https://doi.org/10.5860/crl.76.2.136>
- Walcott, R. (1994) 'Local Citation Studies-A Shortcut to Local Knowledge', *Science & Technology Libraries*, 14 (3): 1–14. [https://doi.org/10.1300/J122v14n03\\_01](https://doi.org/10.1300/J122v14n03_01)
- Woods, S. (2024) 'A Programmatic Approach to Journal Use and Citation Analysis', *portal: Libraries and the Academy*, 24: 177 – 200, available:  
[https://preprint.press.jhu.edu/portal/sites/default/files/10\\_24.1woods.pdf](https://preprint.press.jhu.edu/portal/sites/default/files/10_24.1woods.pdf) [accessed in August 2024]
- Zafrunnisha, N. (2012) 'Citations in the sociology doctoral dissertation: a quantitative analysis', *International Journal of Information Dissemination and Technology*, 2 (3): 212-218, available:  
<https://ccme.mmumullana.org/index.php/ccme/article/view/100> [accessed in August 2024]