

University Extension: An Analysis of the State of the Art on the Relationship Between University and Society Aiming at Social Inclusion

Extensão Universitária: Uma Análise do Estado da Arte sobre a Relação entre Universidade e Sociedade Visando à Inclusão Social

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ABSTRACT

The gap investigated in this study is in understanding how university extension practices effectively promote social inclusion. The objective is to analyze how university extension has been approached in studies that deal with the relationship between universities and society, with a focus on the search for social inclusion. The research is based on theorists Renato Dagnino and Marilena Chaui, who discuss education as a transformative practice and the university as an agent of social change. For this, a bibliometric analysis was carried out and the ProKnow-C tool was used, which maps publications and provides informative indexes to assist in the literature review. This review sought to identify gaps and research opportunities in underexplored or emerging areas. The main result highlights three main gaps: the evaluation and validation of the results of extension projects, the solidarity economy as an instrument of social inclusion, and knowledge management. These gaps represent potential research foci to examine how extension actions can impact the community.

Keywords: bibliometrics; social inclusion; university extension; society.


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RESUMO

A lacuna investigada neste estudo está na compreensão de como as práticas de extensão universitária promovem efetivamente a inclusão social. O objetivo é analisar como a extensão universitária tem sido abordada em estudos que tratam da relação entre universidade e sociedade, com foco na busca pela inclusão social. A pesquisa apoia-se nos teóricos Renato Dagnino e Marilena Chaui, que discutem a educação como prática transformadora e a universidade como um agente de mudança social. Para isso, foi realizada uma análise bibliométrica e utilizada a metodologia *ProKnow-C*, que mapeia

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RESUMO

as publicações e fornece índices informativos para auxiliar na revisão de literatura. Essa revisão buscou identificar lacunas e oportunidades de pesquisa em áreas pouco exploradas ou emergentes. O principal resultado aponta três lacunas principais: a avaliação e validação dos resultados dos projetos de extensão, a economia solidária como instrumento de inclusão social e a gestão do conhecimento. Essas lacunas representam potenciais focos de pesquisa para examinar como as ações de extensão podem impactar a comunidade.

Palavras-chave: bibliometria; inclusão social; extensão universitária; sociedade.

Introduction

The phenomenon studied in this research is the relationship between the university and society, mediated by university extension. Thus, the social impact is a measure that attests to the efficiency of extension activities, which merits a more in-depth analysis of how studies are organized on this practice that takes effect in the socialization of academic knowledge produced in higher education institutions.

The inseparability of teaching, research and extension forms the concept of the university's triple mission, which establishes that these principles must be followed equally in order for higher education to function effectively. Thus, the theory on which this research is anchored is the triple mission of the university and the theories of cooperation and knowledge networks, also incorporating perspectives from the solidarity economy (Dagnino, 2015).

The social impact of universities is a topic as old as the institution itself. Historically, this impact has always been present in society, as the knowledge produced has led to various changes. However, there has not always been concern for the social aspects and distributive equity of the scientific and technological goods produced by universities (Franco & De Faria, 2019).

This study is important in that it seeks to identify categories and, within them, map the most addressed and existing gaps, indicating where there is potential for exploration by future research, as well as, through bibliometric analysis, pointing out the research and authors that achieve greater relevance in the topic, both nationally and internationally.

Focusing on Brazilian higher education, the context of this study seeks to address the challenge proposed by Dagnino (2015), which is to reconcile the academic quality present in university research with the social relevance so necessary for local communities.

Thus, the question posed by the study can be formulated as follows: How has university extension been treated in research that addresses the relationship between university and society in the search for social inclusion?

The general objective of this research is to understand how university extension has been approached from the perspective of the university/society relationship when thinking about social inclusion. Based on this general objective, the following specific objectives were established: a) to define key terms that would allow the return of research related to the defined topic; b) to determine which databases are the most appropriate for the research; c) to carry out a search for research directly related to the topic; d) based on the results in the databases, to identify the most relevant articles based on methodological criteria; e) to analyze the results and map the production of the topic.

This study is justified by the need to verify the theoretical structure of the subject through a mapping of elements that include the authors, works, and institutions most relevant to the field of study. In this way, it provides greater clarity for future studies on the subject, pointing out areas that have been less explored and gaps that have greater academic, social, and practical potential.

Theoretical background

THE RELATIONSHIP BETWEEN UNIVERSITY AND SOCIETY

The role of the university in society gives rise to discussions that place the institution as fundamental to social development and advancement. Chauí (2003) argues that such an institution has a republican character and should therefore represent the whole of society, i.e., it should act to mediate conflicts and tensions that may arise in the social structure. However, in fulfilling its role, the university cannot remain oblivious to the concrete needs of its social environment and cannot be divorced from the multiple interests and groups that make it up.

This attitude reinforces its role as an agent of social transformation (Bianchetti & Sguissardi, 2017).

Historically, however, the university has not always been fully aligned with the interests of society, as it has often been tied to the dominant forces of each period and thus at the mercy of the ideological interests of its tutors. Thus, in the Middle Ages and in the Modern Age, this institution was at the service of Christian hegemony, while from the 19th century on, it adhered to the ideals of the Enlightenment and began to serve the interests of the bourgeoisie and the state, thus serving the capitalist mode of production. Finally, in the 21st century, the university has adopted a new way of relating to knowledge and the student, who is now characterized as a customer, and the market dictates both the form and content of teaching. As a potential source of profit, education becomes another commodity to be traded through shares on the stock exchange (Bianchetti & Sguissardi, 2017).

There is also a strand that, more recently, sees the university as an agent for promoting the development of technologies and knowledge capable of boosting local economies (Ugnich et al., 2020). In this scenario, the third mission of the university - extension - is considered the link between teaching and research in relation to social and local needs, assuming the role of driving the integration between scientific and technological development and social demands (Lončar-Vicković et al., 2022; Meskhi et al., 2020). Thus, extension acts as an agent responsible for the allocation of resources and the management of socially oriented knowledge in the institution, facilitating the transfer of knowledge and technology to society as a whole, rather than limiting itself to the commercialization of knowledge (Blando-Montoro et al., 2019).

SOCIAL IMPACT OF THE UNIVERSITY

The idea of the university's social impact is directly linked to a concept typical of institutions in the global North: University 3.0, which emphasizes academic entrepreneurship and the materialization of innovations through patents and licensing (Compagnucci; Spigarelli, 2020). This entrepreneurial condition is instrumentalized by the first two missions and made effective by the third (Gomes et al., 2021).

As an alternative to this vision of patents and licensing, there is that of social innovation, which involves actions less focused on business/commercial develop-

ment and more focused on social development processes (García Gutiérrez et al., 2021), which are more widespread in countries of the South (Bayuo et al., 2020). This concept is more associated with Latin countries and is called university extension, which can be promoted through different actions, but aimed at the collective interest (Arruda-Barbosa et al., 2019).

Social impact is an essential tool for evaluating the effectiveness of university production, since it is the way in which the university positions itself in society and can promote change according to the needs of social groups. This is what characterizes the university as an effective social institution (Chauí, 2003).

This view converges with that of Dagnino (2019), who argues that it is essential to consider populations that are economically vulnerable and structurally unemployed and that have, to some extent, the potential for collective and productive organization.

Dagnino (2015) presents a university project that places Extension as a central agent. This project is based on three concepts: the unfeasibility of the techno-productive model, which must be oriented towards the benefit of the entire population; the overcoming of the material capacity deficit, expressed in the lack of infrastructure and social exclusion; and the allocation of productive and techno-scientific potential to meet this challenge. In this way, university extension has the potential to promote the solidarity economy. As solidarity enterprises consolidate, they develop social technology through the sociotechnical adaptation of conventional techno-science produced for and by enterprises and with the support of the public education and research complex, which will make them increasingly sustainable in economic, social, cultural and environmental terms.

RESEARCH LINES AND THEORETICAL DIRECTIONS

Based on an analysis of the literature, it can be seen that different approaches have emerged in the field of study that deals with the relationship between universities and society. This is justified by the fact that the university is an institution that has existed for thousands of years and has been influenced by the different historical periods through which it has passed. However, two lines stand out and are highlighted in this study. The first focuses on university entrepreneurship and the commercialization of technological innovations, based on the concept of University

3.0, as discussed by Compagnucci and Spigarelli (2020). The second focuses on the concept of social innovation and, to this end, sees university extension as a means of mediation between the institution and the community, and thus as a means of social transformation, especially in contexts of vulnerability (García Gutiérrez et al., 2021). This research identifies with the latter line, as it prioritizes the evaluation of social impact based on extension actions and their transformative potential.

In this context, several studies reviewing the literature address university extension, highlighting its relevance as a field of study and as a practical tool for social inclusion and local development. These studies indicate that there is a need for a more effective articulation between university missions, especially extension with the first two, simultaneously, in which the integration between university and society must be emphasized (Belando-Montoro et al., 2019; Touriñán López, 2021). In other words, extension cannot only be considered a complement to teaching and research but must also be seen from the perspective of social inclusion through science and technology, thus fulfilling an effective role for the university of the 21st century.

EMPIRICAL DEVELOPMENTS

In this context, it can be seen that recent studies highlight the importance of universities as transmitters of knowledge, especially science and technology, capable of fostering local and social development in the community. Ugnich et al. (2020) show that this institution has stood out as an influential agent of economic transformation, while Longhini et al. (2021) note that the university plays an important role in the creation, development, and promotion of social technologies, i.e., those that do not have a significant commercial value, but that have an important social impact on the local community.

In Brazil, when it comes to university extension, recent empirical developments have shown consolidated and effective mechanisms for promoting actions that aim to promote the knowledge produced in the university environment, with the solidarity economy being one of these options. This allows local communities to benefit from these scientific, technological and cultural assets and, through extension actions, to produce their own experiences and seek solutions to local problems (Dagnino, 2019).

Methodology

This research uses the classification known as the Saunders et al. (2016) onion, or research onion. It is a conceptual model that helps in the methodological choices of the work, providing a structure of examples presented in layers, broken down from the philosophy of the studies to the data analysis techniques. In this context, in terms of nature, this research is theoretical; in terms of objective, it is exploratory/descriptive; the philosophy adopted was interpretivist; the logic chosen was inductive; the time horizon, on the other hand, is cross-sectional, while the approach is qualitative. As far as the subjects of the study are concerned, they are the scientific publications that deal with the subject, to which access is free through the databases selected through the Capes portal.

The data collection strategy used consists of the procedures proposed by the ProKnow-C methodology (Knowledge Development Process-Constructivist), which defines a general set of actions implemented in this study. According to Afonso et al. (2011), ProKnow-C is of great value for the construction and delimitation of the scope of a given field of knowledge, as it presents structured and rigorous procedures. From this perspective, this tool can be defined as

a series of sequential procedures that begin with defining the search engine for scientific articles to be used, followed by a series of pre-established procedures until reaching the stage of filtering and selecting the relevant bibliographic portfolio on the subject (Afonso et al., 2011, p-5).

This method consists of a set of actions divided into four orderly and consecutive stages: definition of the bibliographic portfolio; bibliometric analysis; systematic analysis; preparation of the research project. The portfolio and bibliometrics are part of the bibliometric analysis, while the systematic analysis and project are the practical results of the *ProKnow-C* methodology (Afonso et al., 2011).

The research in question focuses on the portfolio, bibliometrics and systematic analysis stages. The flow of the methodology is exemplified by Chart 1, which, from the reading of the seminal article to the results of the research, presents a flowchart of the stages, actions and expected results.

Chart 1. Flowchart of the *ProKnow-C* methodology used in the research.

Stages	Actions	Expected results
1 ^a	Analysis of the seminal article	First insights into the topic
	Bibliometric research	Formulating the research question
	Systematic review	Identification of search terms
2 ^a	Definition of databases	Insights into the most suitable bases for the topic
	Validation of search terms	Identifying the sample size
	Searching the databases	Exporting database metadata
3 ^a	Merging metadata	Exclusion of repeated files
4 ^a	Data extraction and graphics	Graphical presentation of bibliometric analysis
5 ^a	Article description analysis	Graphical presentation of methods and approach
6 ^a	Conceptual analysis of approaches	Conclusions and recommendations

Source: based on Touriñán López (2021) and Afonso et al. (2011).

These stages are permeated by the categories of analysis that guide the research, and which are at the heart of the investigation, shown in Chart 2.

Chart 2. Categories of analysis.

Categories	Guidance questions
University extension	What is the perception of this concept in the research analyzed?
University x society	What are the attributes of mediation between the institution and its surroundings?
Social inclusion	What role do extension policies play in social inclusion?

Source: prepared by the authors.

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BIBLIOMETRIC ANALYSIS

Defining the key terms for searching the databases

Based on the basic units of analysis, we proceeded to define the search terms to be used in the databases. These terms would help in the selection and study of studies on the topic. After reading the seminal article (Dagnino, 2015) and trying to avoid expressions and words that, even if previously defined, might not yield satisfactory results, sets of terms were defined.

The first set of terms defined were: “university extension projects” and “third mission of the university.” These terms were used as synonyms because in centralized countries, such as North America and Europe, “Third Mission” is understood to be what University Extension is in Brazil.

The second set of terms referred to the institution: “university” and “university role”. These terms were arranged in this way to look for research that analyzes how the institution is inserted into society and its role in dealing with issues such as technology transfer and social problems.

Finally, the third set of terms was “public policy for social inclusion”. Based on the seminal article and the author’s suggestions, this term sought to identify how research has approached public policies for social inclusion through extension projects.

These terms were grouped into three sets, arranged in the order shown in Figure 3.

Chart 3. Organization of keywords for the database search.

Structure of the sets	
Set 1	“University extension projects” OR “Third Mission of the university”
Set 2	“University” OR “university role”
Set 3	“Public policy for social inclusion”

Source: prepared by the author.

Definition of databases

The databases selected for the research were *Web of Science (Clarivate Analytics)* and *SciVerse Scopus (Elsevier)*, which stand out on the international scene

due to their diversity of multidisciplinary publications (Zhu; Liu, 2020). Both bring together elements for a bibliometric analysis and a literature review that achieves valid and acceptable results.

PERFORMING THE DATABASE SEARCH

Web of Science

The following specifications were used to search the *Web of Science* (WoS):

```
[TITLE-ABS-KEY ("university extension projects" OR "Third Mission of the university")  
AND TITLE-ABS-KEY ("University" OR "university role") OR TITLE-ABS-KEY ("Public po-  
lity for social inclusion")] AND [LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR,  
2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO  
(PUBYEAR, 2019)].
```

The search was carried out as follows: the first line contained the most basic search terms, namely "university extension projects" and "third mission of the university", separated by the connective "OR" to indicate that the search could include one or both sets of terms. It was decided to search for these terms in the titles, keywords, and abstracts of the studies.

In the second line, "university" and "university role" were also separated by the "OR" conjunction and searched for in the titles, keywords, and abstracts of the searches. However, the first and second lines were separated by the "AND" connective so that the search was based on the extension and added the discussion of the university's role in society.

The third line contains a single set of terms: "public policy for social inclusion". These terms were also searched for in the titles, keywords, and abstracts of the studies. In this case, the second and third lines were separated by the connective "OR", so that the search was based on the extension and added to the discussion of the role of the university in society and/or public policies for social inclusion.

The search was limited to the period from 2019 to June 1, 2023, with no other restrictions. As a result, 31 documents were returned.

Scopus

The following specifications were used in the Scopus database:

Analyze Results: “university extension projects” OR “Third Mission of the university” (All Fields) AND “University” OR “university role” (All Fields) OR “Public policy for social inclusion” (All Fields) and 2019 or 2020 or 2021 or 2022 (Publication Years).

The procedures were identical to those adopted in *Web of Science*. However, it was observed that when searching only for the terms in the title, keywords and abstracts fields, no results were returned. This led to a search being carried out in all fields for the selected terms. The other criteria, such as connectors, time delimitation and other limiting factors, did not change in relation to the databases. The result was 54 documents returned.

Bibliometric analysis in Bibliometrix

The search through bibliometric analysis resulted in the collection of 54 documents in *Scopus* and 31 in *Web of Science*, with three duplicates consecutively excluded. The result was 72 files. Biblioshiny - Bibliometrix software was used to analyze these documents, which provided general information on abstract, author, type of document, journal, and citations.

By importing the metadata for analysis into a single file in Biblioshiny, the first analysis performed is an overview of the raw data, which can be seen in Figure 1.

As can be seen in Figure 1, the metadata in the categories abstract, author, type of document, journal, language, year of publication, title and total citations were rated as excellent. Meanwhile, the categories affiliation and keywords were rated as good for analysis.

On the other hand, there is data that was not well evaluated by the software. The DOI (*Digital Object Identifier*) field was only rated as acceptable, as it was absent from 15.28% of the documents. The corresponding authors and cited references categories were classified as poor in terms of data validity, with 25% and 27.78% missing, respectively. Finally, the software recommends that the analysis of more keywords, number of cited references and scientific categories should not be carried out, since their percentages of absence are 73.61%, 100% and 100%, respectively.

Figure 1. Overview of the validity of the data collected.

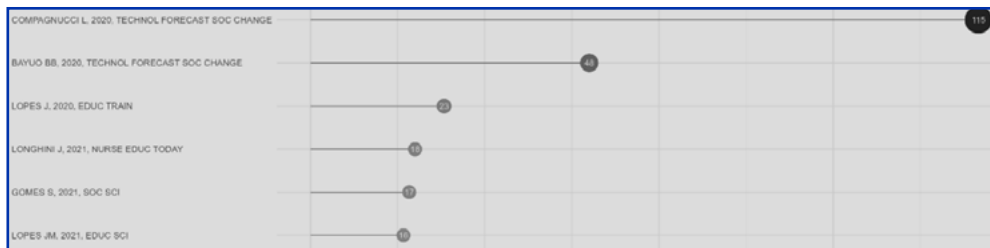
Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
AU	Author	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
C1	Affiliation	1	1.39	Good
DE	Keywords	3	4.17	Good
DI	DOI	11	15.28	Acceptable
RP	Corresponding Author	18	25.00	Poor
CR	Cited References	20	27.78	Poor
ID	Keywords Plus	53	73.61	Critical
NR	Number of Cited References	72	100.00	Completely missing
WC	Science Categories	72	100.00	Completely missing

Source: Biblioshiny, in an analysis carried out by the authors.

Authors: the most relevant affiliation

In this context, it can be seen that there is no author who stands out in terms of citations during the period from 2019 to June 1, 2023. Only Lopes et al. (2020a) have three citations, while the other most cited authors have two citations. However, when considering the globally cited documents, the configuration is different, as illustrated in Figure 2.

Figure 2. Scientific production by country.



Source: Biblioshiny, in an analysis carried out by the authors.

In the analysis of Figure 2, the research by Compagnucci and Spigarelli (2020) stands out. This article is entitled “The third mission of the university: a systematic literature review on potentials and constraints”. The fact that it is a systematic review may show that there is a lack of attempts to build an organized theoretical framework, which may explain the disparity between this research and empirical studies.

As for the most relevant affiliation, the results are shown in Table 1.

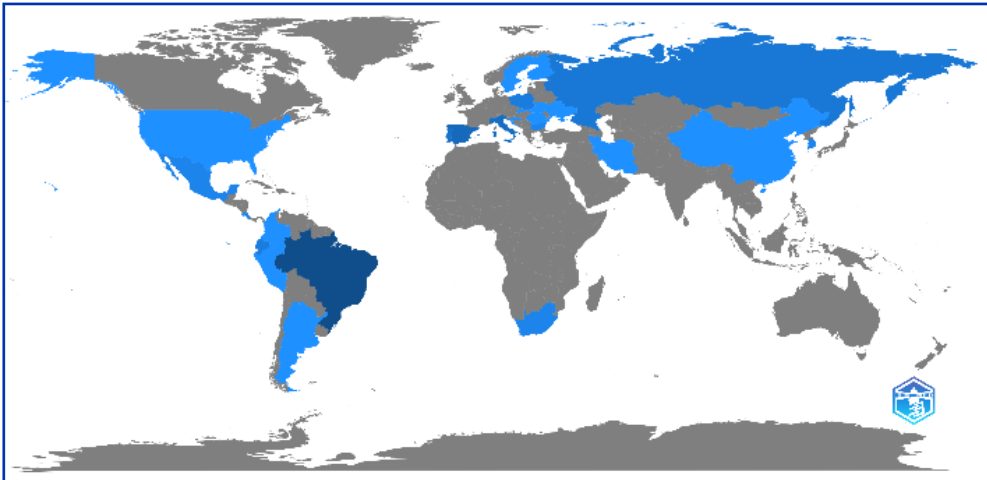
Table 1. Most relevant affiliations.

Research institution	No. of surveys
Universidade de São Paulo (Brazil)	9
Universidade Federal do Rio Grande do Sul (Brazil)	4
Universidade Federal do Triângulo Mineiro (Brazil)	4
Ural Federal University (Rússia)	4
Universidad Nacional de Colombia (Colombia)	3
Universidade Federal de São Paulo (Brazil)	3
Don State Technical University (Russia)	2
Universidade Federal do Pará (Brazil)	2
J (author correspondent)	2
Oficina Universitaria de Aprendizaje-Servicio • UNED (Spain)	2

Source: Biblioshiny, in an analysis carried out by the authors.

Table 1 highlights the Universidade de São Paulo (USP) as a relevant affiliation, with a significant number of research projects. It is also important to note that institutions from two countries, Brazil and Russia, stand out, followed by Colombia and Spain. This data is confirmed by the number of publications per country, as shown in Figure 3.

Figure 3. Scientific production by country.



Source: Biblioshiny, in an analysis carried out by the authors.

Scientific production by country shows that research on the subject is concentrated in countries such as Italy, Spain, and Brazil. The European countries have 8 and 10 studies, while Brazil has 55. On the other hand, it was also found that the most cited countries in the studies were Italy, Portugal, and South Africa. This data refers to the number of times articles from these countries cited the keywords defined for the database search (Andrade, 2021).

Most relevant words and word clouds

The word cloud (Figure 4) is a way of illustrating the occurrence of keywords that emerge from bibliometric analysis, since the frequency of certain terms can indicate groups and the interrelationship of meaning, similarity and conceptual intersection (Freire, 2021).

Figure 4. Word cloud.

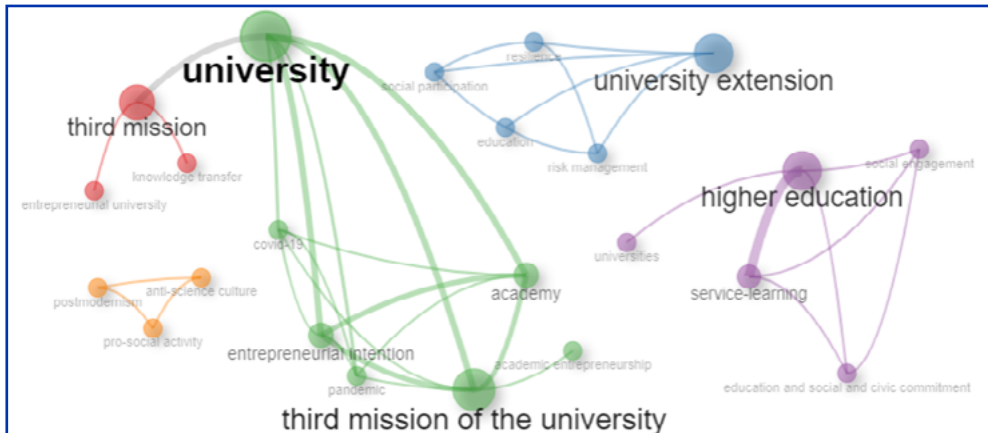


Source: Biblioshiny, in an analysis carried out by the authors.

The terms that stand out most, in order of occurrence, are: university extension; university; higher education; third mission of the university; third mission; education; occupational therapy; service learning; academics entrepreneurship. The emergence of these keywords shows that there was an alignment between the research objectives and the results of the database search.

There are, however, other elements that should be considered when thinking about keyword search terms. Co-occurrence refers to the conceptual interrelationship, through a graphic representation that provides a didactic example of how certain concepts are linked to others, forming data sets. This type of analysis is widely used in discourse analysis and in areas that seek to identify patterns of relationships between terms (Franco & De Faria, 2019). This is shown in Figure 5.

Figure 5. Keyword co-occurrence network.



Source: Biblioshiny, in an analysis carried out by the authors.

Figure 5 shows groups of co-occurrences between the keywords. The most relevant group is centered on the term “university”, which connects with “third mission of the university” and “third mission”. These three terms form an isolated group, indicating possible conceptual and cultural issues that limit their interconnection with other groups. The second group is made up of the term “university extension”, which is connected to terms that are not related to other groups, although they maintain a conceptual correlation. The third group is made up of the term “higher education” and is not connected to other groups. The same is true of the fourth group, which is the smallest of all.

Results

DATA INTERPRETATION: ANALYSIS OF VALIDITY AND SCIENTIFIC PRODUCTION

A critical analysis of the data extracted from bibliometrics points to some elements that deserve to be highlighted and a more detailed reflection of possible indications and existing trends. Among these aspects, the fact that no author stands out significantly in terms of the number of citations may be related to the time frame of

five years, showing in this window, given the limited inclusion of classic and more consolidated studies on the subject, that an analysis of this point would require a longer time frame. However, this problem could be a characteristic of the fragmentation of the field of study, in which the production is distributed among different scholars, without basic authors who are fundamental references for the definition of the topic. In this way, there may be a lack of a unified and consolidated theoretical framework, as is the case in fields of study that have widely recognized reference works.

The study by Compagnucci and Spigarelli (2020) is relevant because it has 115 citations, which contrasts with the low average number of citations of other research, indicating that the isolated impact of this research may indicate a field that is not well established, still in a consolidation phase, with few works that achieve international prominence. It also suggests that there may be a lack of systematic reviews, as is the case here, to organize the theoretical structure of the field of study. If this were a well-established field, this graph might show several empirical papers achieving prominence in citations.

Institutional affiliation shows that the dominance of a single institution, in this case USP, can indicate the centralization of resources and knowledge, harming other institutions and regions of the country. This raises the question of how concentration in one or a few institutions can limit the diversity of approaches and restrict the groups of researchers who could enrich the debate on the field of study. This concentration also suggests that scientific production is concentrated in certain regions of Brazil, which ends up limiting what could be a broader view if it included other regions and countries.

The analysis by country shows an interesting discrepancy between the number of studies and the number of countries mentioned: Brazil leads in terms of the number of studies (55), while Italy is the most cited country (133 times); Portugal is cited 56 times and Brazil only 9 times. This could be explained by a possible limitation of the search terms or even by a focus on certain regional approaches. Thus, although Brazil is an important producer in this field of study, its production has not yet been reflected in international publications. This could be an opportunity to improve the internationalization mechanisms of Brazilian research, while at the same time increasing its global impact.

The analysis of keywords shows a strong correlation between search terms and research objectives, with a greater emphasis on university extension and the third mission. On the other hand, the analysis of co-occurrence shows that these terms form isolated conceptual groups, indicating conceptual and geographical fragmentation. While the first term comes mainly from the countries of the Global South, the second is mainly from European and North American countries. These are currents of thought and/or areas of study that operate in a disconnected manner, limiting the construction of a more cohesive and interdisciplinary theoretical framework.

Categories envisioned

Based on the bibliometric analysis, some categories of selected research were identified, as follows:

- a.** Evaluation and validation model: research aimed at measuring the social impact of Extension, i.e., how it achieves social effectiveness. An example is the work of Santos and Coelho (2023).
- b.** Analysis and reporting of results: more publications describe extension actions and their impact, and suggest possible new interventions, as in the case of Dutra et al. (2018).
- c.** Critical analysis of extension: they try to historicize the concept of extension and analyze its different uses and institutional implications.
- d.** The role of the university in society: they discuss conceptually and empirically the contribution of the university to society, including technology transfer activities and social entrepreneurship.
- e.** University 3.0 and the third mission: explores the contribution of the university beyond teaching and research, focusing on patent production and licensing, and the management of knowledge produced at the university as a form of self-financing.
- f.** Solidarity economy and social innovation: this is an area with great potential for exploration, but it is still in its infancy, with few publications.
- g.** Academic entrepreneurship: This research presents discussions that deal with preparing students for the job market and promoting entrepreneurship.
- h.** Knowledge management: they deal with the social responsibility of universities to manage knowledge to transform it into economic value.

The emergence of these categories has provided an organized view of the field of study, making it possible to identify the most researched areas and those with the greatest potential for future research, as shown in Figure 5 below.

SYSTEMATIC REVIEW

Based on the results of the bibliometric analysis, 72 documents were selected for a full, in-depth reading. The aim of this stage was to select a final sample that would provide the data needed to analyze the concepts and identify gaps.

Exclusion/inclusion criteria

After merging the files, 72 remained in the inclusion process. The documents were then analyzed and inclusion/exclusion criteria were established by analyzing the concepts covered in the research. Based on the criteria model proposed by Cavalcanti (2016), the following were established:

Chart 4. Criteria for inclusion/exclusion of documents in the analysis.

	Criteria	Inclusion	Exclusion	Total
A	Could not be accessed due to restricted access or broken links	57	15	72
B	Repeats that were analyzed by the Bibliometrix software	55	2	57
C	Use of an extension project only to collect data, without reflecting on conceptual issues and the relationship between university and society	40	15	55
D	Outside the proposed theme, without citing underlying concepts	40	00	40

Source: prepared by the authors.

Chart 4 shows that of the 72 documents, 32 were excluded and 40 were included in the analysis. Once those included had been defined, they were read, which enabled a more detailed understanding of their methodological characteristics and approaches. From this analysis, the most explored aspects of the research

Chart 5. Articles displayed according to their objectives and methodologies.

Author/year	Methodology	Envisioned categories							
		Evaluation and validation model	Analysis and reporting of results	Critical analysis of extension	The university's role in society	University 3.0 and the third mission	Solidarity economy and social innovation	Academic entrepreneurship	Knowledge management
Santos & Coelho (2023)	<i>Design science research</i>	x							
Adriani et al. (2023)	Relato de experiência		x						
Costanzo et al. (2022)	Survey	x							
Diniz et al. (2022)	Estudo de caso único			x					
Li et al. (2022)	Análise documental							x	
Lončar-Vicković et al. (2022)	Estudo de caso único					x			
Yuln et al. (2022)	Relato de experiência		x						
Abanto et al. (2022)	Estudo de caso único			x					
Araújo et al. (2022)	Relato de experiência						x		
Fernandes et al. (2022)	Relato de experiência		x						
Donini et al. (2022)	Estudo de caso único		x						
Sulaiman et al. (2021)	Relato de experiência							x	
Silva et al. (2022)	Relato de experiência		x						

Mäkinen; Esko (2022)	Estudo de caso único					X
Medeiros et al. (2022)	Análise estatística bivariada				X	
Silva et al. (2021)	Estudo de caso único		X			
Lopes et al. (2021)	Estudo de caso único		X			
Gomes et al. (2021)	Survey					X
Longhini et al. (2021)	Revisão sistemática				X	
Pastukhova et al. (2021)	Estudo de caso único				X	
Lievore et al. (2021)	Estudo de caso múltiplo			X		
De Souza Angelim et al. (2021)	Estudo de caso único			X		
García Gutiérrez et al. (2021)	Estudo de caso múltiplo				X	
Touriñán López (2021)	Análise documental					X
Compagnucci & Spigarelli (2020)	Revisão sistemática				X	
Carl & Menter (2021)	Estudo de caso único				X	
Bayuo et al. (2020)	Revisão sistemática					X
Biranvand & Seif (2020)	Análise fatorial confirmatória				X	
Francelino & Bregalda (2020)	Estudo de caso		X			
Lopes et al. (2020b)	Regressão linear					X
Meskhi et al. (2020)	Estudo de caso único				X	
Assis da Silva et al. (2020)	Relato de experiência		X			
Ugnich et al. (2020)	Estudo de caso único				X	
Arruda-Barbosa et al. (2019)	Estudo de caso único		X			
Kobylarek et al. (2019)	Ensaio teórico				X	
Belando-Montoro et al. (2019)	Estudo de caso único				X	
Costa et al. (2019)	Relato de experiência		X			
Chaves et al. (2019)	Estudo de caso único				X	
Dutra et al. (2018)	Estudo de caso único		X			

Source: systematic review carried out by the author.

were identified, as well as the gaps that still need to be investigated. The results of this analysis are presented in Chart 5.

After selection, 40 studies were included, distributed in the following thematic categories:

- Evaluation and validation model: 2 studies.
- Analysis and reporting of results: 12 studies.
- Critical analysis of extension: 4 studies.
- Role of the university in society: 8 studies.
- University 3.0 and the third mission: 9 studies.
- Solidarity economy and social innovation: 1 study.
- Academic entrepreneurship: 3 studies.
- Knowledge management: 1 study.

This survey made it possible to organize the studies according to their main approaches and contributions to the topic in question.

RESEARCH GAPS

The field of study is conceptually interconnected, but it can be seen that in terms of research, some areas, and concepts are more explored, while others have greater potential for exploration and gaps that should be investigated and analyzed from specific perspectives. These gaps offer opportunities for the development of future research with the aim of enriching the field of university counseling and its subsequent social impact.

Regarding the matrix “Evaluation and Validation Models”, there is a lack of research on this topic, although the need to measure the social impact of Extension is evident. To fill this gap, future research could address the development of evaluation tools and methodologies for Extension that would allow for longitudinal evaluation of social impacts (Costanzo et al., 2022).

In the “Analysis and reporting of results” matrix, there were more publications presenting the impact and possibilities for new social interventions in the field of activity. In this case, as in the case of the previous matrix, there is an opportunity for future research to explore the extent to which the results of these studies could sup-

port public policies that ensure that the knowledge generated in higher education institutions is used more efficiently by communities.

The “critical analysis of extension” matrix included four studies that sought to historicize the concepts and verify the implications of extension for the reality of the university model in which the project is inserted (Sulaiman et al., 2021). Although this analysis is fundamental, it is understood that it should be cross-cutting in research and not listed as a specific gap.

Regarding the “role of the university in society”, we found a considerable number of publications discussing this role and the performance of the university in society. We believe that this is not a gap, but rather an issue that should permeate all other research. An equally important issue in this matrix is the analysis of Law No. 13,005 of June 25, 2014, which guarantees at least 10% of the curricular credits required in undergraduate courses for university extension activities, especially in areas of great social relevance.

The matrix “University 3.0 and the Third Mission” has a considerable number of publications and is an important issue for Brazilian academia. However, there is disagreement among the authors about the application of these concepts in Latin American and Brazilian universities, which are heavily funded by the state (Bayuo et al., 2020).

The matrix “Solidarity economy and social innovation” presented only one piece of research, making it one of the biggest gaps identified. This topic, central to the seminal article, found few responses in the research, demonstrating the need to explore this area both in field research and at a conceptual level, related to university extension - in this sense, practical case studies that demonstrate the integrative capacity of the solidarity economy in extension actions, in addition to exploring its intersection with social innovation in perspectives on the role of the university as an agent of social transformation.

The “academic entrepreneurship” matrix has a concept related to University 3.0 and the third mission, but it is more related to individual initiatives arising from subjective issues (Li et al., 2022). This area has potential for new research that links the university with the business sector.

Finally, there was only one study in the “knowledge management” matrix. This topic is also secondarily related to the seminal article dealing with cognitive

policies (Dagnino, 2015). This indicates a gap to be explored in terms of research on how universities manage their scientific production and how this knowledge is transferred to society. Opportunities for future research point to methods and tools that help improve their knowledge management systems, enabling the effective transfer of cultural, scientific, and technological goods to society. Likewise, the analysis of public-private partnerships to increase the social impact of the knowledge generated.

In light of the above, three practical proposals emerge to fill these gaps, namely The development of evaluation metrics that measure the social impact of extension, based on qualitative and quantitative indicators; the promotion of inter-disciplinarity - research on the solidarity economy should integrate a range of disciplines such as economics, administration, social sciences, accounting and public policy, among others, to develop more effective and comprehensive solutions; the creation of collaborative networks between research groups and universities, governments and social organizations, so that there can be an improvement in cognitive policy and knowledge management to ensure the transfer and dissemination of knowledge to society.

Conclusion

With the rapid growth of academic publishing, it has become necessary to use tools that provide synthetic overviews of the evolution of production on specific topics and identify any gaps. However, the large number of available studies, although offering more possibilities, makes it difficult for researchers to choose their theoretical references and to assess the state of the art in a given field of knowledge. Therefore, based on Afonso et al. (2011), the aim of this research was to conduct a literature review with the following specific objectives: a) to define key terms that would allow the search for studies related to the defined topic; b) to determine which databases are most appropriate for the research; c) to conduct a search for studies directly related to the topic in the selected databases; d) to identify, based on the results of the databases, the most relevant articles according to methodological criteria; e) to analyze the results and map the production on the topic.

The first objective, aimed at defining keywords, was based on the seminal article by Renato Dagnino (2015), which made it possible to determine the most suitable terms that would yield reliable results for the measurement and conceptual delimitation of future research. Regarding the second objective, related to databases, it was decided that Web of Science and SciVerse Scopus were the most appropriate to obtain academic results relevant to the research. The third objective consisted of searching the databases, which resulted in 54 documents found in SciVerse Scopus and 31 in Web of Science.

In the fourth objective, a bibliometric analysis of the metadata was carried out, which made it possible to verify the most relevant authors, the journals that have published the most on the subject, the most cited countries with the highest number of authors, as well as the most relevant words in the research. This analysis gave an overview of the research and provided insights for in-depth reading.

In the fifth and final objective, the texts were analyzed through in-depth readings, which allowed us to see how the concepts of university extension and third mission are approached and worked on by the researchers, as well as the extent to which these terms are synonymous or not. It was observed that in Latin American countries the term “third mission” is not used, since it carries an ideological charge specific to US and European universities, where funding is not exclusively from the state. In Latin American universities, the term “university extension” does not refer to the commercialization of knowledge, but rather to the possibility of the university to connect with the community. What can be observed is that there may be a greater connection between studies related to the third mission and university extension. Although they are not equivalent due to ideological issues, they are conceptually related, so there could be convergence in studies that address the role of the university.

Finally, the research makes an academic/scientific contribution by highlighting the need for more comprehensive studies dealing with the social impact of university extension. In addition, there was an overview of thematic categories that provide a mapping of the field of study, identify consolidated areas and gaps to be explored, and establish a contribution to future research by offering paths to a more robust and interdisciplinary theoretical framework.

Likewise, there was a practical contribution, since the research suggests concrete ways to improve university extension, namely: the development of evaluation

metrics that measure social impact and the promotion of interdisciplinarity, which would foster collaboration between different fields of knowledge, and investigations regarding the establishment of Law No. 13.005/2014, which regulates the minimum limit of extension hours in graduate courses.

Finally, a social contribution highlighted the importance of promoting the inclusion of regional and international issues in the discussion of university extension. It showed the concentration of scientific production in a few institutions and regions, as well as the limited reach of Brazilian research in the global academic scenario, opening space for reflection on how the university, through extension, can act more efficiently as an agent of social transformation, promoting equity and access to knowledge.

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