Analysis of Scientific Production on Social Technologies in Higher Education Institutions

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ABSTRACT
Social technologies (ST) are innovative, applicable, and efficient solutions created and directed in interaction with society and incorporated by it, aimed at generating social integration and contributing to the improvement of people's living conditions. STs are born with an assistance-oriented purpose, aiming to solve concrete problems in society, using local intellectual and material resources, promoting autonomy and social responsibility. In the context of higher education institutions, STs play a fundamental role in development, application, and reproduction. As they are structural to the axes of teaching, research, and extension, in the academic environment, it is expected that STs be conceived, developed, and applied in the community context, strengthening the relationship between academia and society. This study concerns bibliometric research, starting from the following question: how are social technologies addressed by scientific academic production in contemporary times? The objective is to identify the concepts, understandings, and purposes of STs in the scientific environment within the context of Higher Education Institutions (HEIs). The results indicated that digital communication technologies are related to STs; in recent years, HEIs have been using communication technologies to enhance STs.
KEYWORDS: *Alternative technology; Innovative Solutions; organizational structure; Society.*

I.   INITIAL SCENARIO

Social Technologies (STs) are understood as replicable, low-cost actions, methodologies, and techniques developed in partnership with the community. Their objective is to solve problems effectively, feasibly, and applicably, respecting the social and economic characteristics of the community in which they will be inserted, based on the principle of social transformation and the improvement of living conditions (FARIAS; TEIXEIRA, 2022).

According to Corrêa (2010), social technologies emerge from real problems, originating from the most needy and vulnerable layers of society. They should be observed as experiences carried out in urban and rural communities, in environments such as Higher Education Institutions, Research Centers, and scientific movements. The result of these experiences are methods, techniques, and products that promote social transformation.

In the academic area, social technologies arise to meet the criteria established for the processes of teaching, research, and extension. In this process, there is a close relationship between the university universe and society. According to Silva and Resende (2017), this integration process contributes to the expansion of the university space, integrating the community into the academic context and expanding the critical sense and social vision in student academic practice.

Universities have the responsibility to develop actions aimed at social needs. Their theoretical construct will only have real value when the academic community contributes to social transformation, evidencing teaching, research, and extension actions as mechanisms to operationalize their social function and establish a relationship between the academic community and society (TRIBECK, 2022). Thus, the technological and scientific construct developed in research centers can present social characteristics.

This study's premise is to investigate how social technologies have been developed and discussed in contemporary times, seeking literary depth in the productions and publications of social technologies in private higher education institutions, as well as monitoring the impacts of the results presented with their application. Therefore, it is necessary to understand how social technologies are addressed by scientific academic production in contemporary times.

II. OBJECTIVE

Identify the concepts, understandings, and purposes of Social Technologies in the scientific environment, in the context of Higher Education Institutions (HEIs).

III. METHOD

Bibliometric review consists of a systematic study, in which the researcher seeks to highlight how the investigated phenomenon has been emphasized in a given context. In this work, the object of research is social technologies, identifying how they have been discussed, published, and presented in the scenario of private universities.

The electronic search was carried out in April 2025, and the study was built between January and May 2025. For this research, the following steps were followed: definition of the object of study, systematization of objectives, and elaboration of the data collection protocol.

Initially, the Scopus database was accessed, using the descriptor "Tecnologias sociais em instituições de ensino superior" (Social technologies in higher education institutions). The following filters were applied: open access, a time frame from 2020 to 2025, national production, and peer review, which returned 51 publications. Then, a sample cut was made, excluding studies that did not present social technologies or a discussion on the topic in the abstract, or that were duplicated, resulting in 23 samples. The data were grouped into a chart that presents the journals in which the studies were published, another chart that shows the years of publication, and a table that contains the authors, titles, and objectives of the studies, as shown in Table 1.
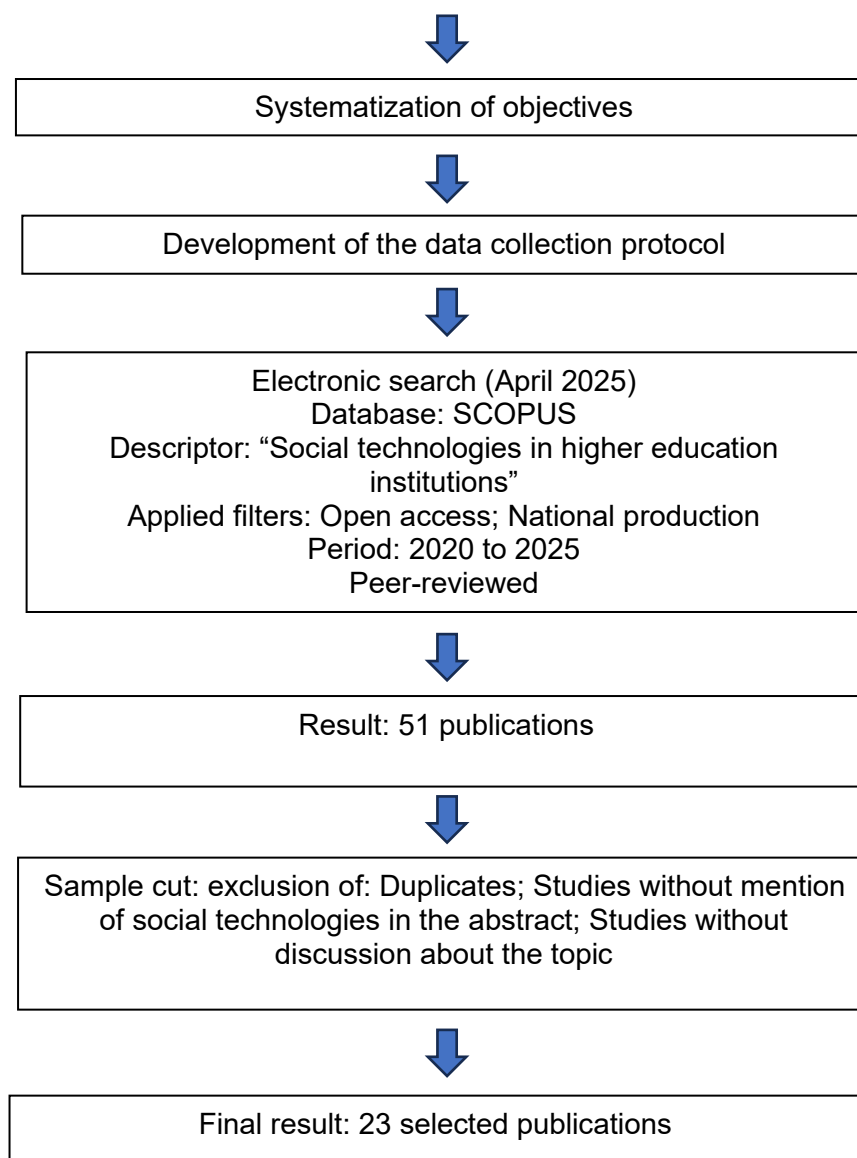
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Systematization of objectives

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Development of the data collection protocol

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Electronic search (April 2025) Database: SCOPUS Descriptor: "Social technologies in higher education institutions" Applied filters: Open access; National production Period: 2020 to 2025 Peer-reviewed

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Result: 51 publications

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Sample cut: exclusion of: Duplicates; Studies without mention of social technologies in the abstract; Studies without discussion about the topic

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Final result: 23 selected publications

Table 1: research method

IV. RESULTS AND DISCUSSION

Figure 1 shows the distribution of the studies found after the applied search. We identified that the 7 studies in code 1 are related to information and communication technologies, with their study objects aiming to contribute to the communication and education process between society and the university. It is also clear that codes 2 through 19 are directed at works with technologies such as hybrid learning, remote learning, and digital classrooms, with a bias towards the teaching and learning process, creating a digital classroom environment. From codes 20 to 25, we identified works in the field of distance education (EaD), data management, and organizational management. Distance education is also promoted. Figure 1 also presents the journals in which the studies are published. It is possible to identify the quantity of articles published, with a total of 51 works. It is observed that universities show greater interest in studies directed toward the area of social technologies, with a higher concentration in national journals.

Figure 1: Distribution of journals on scientific productions of social technologies in Higher Education Institutions
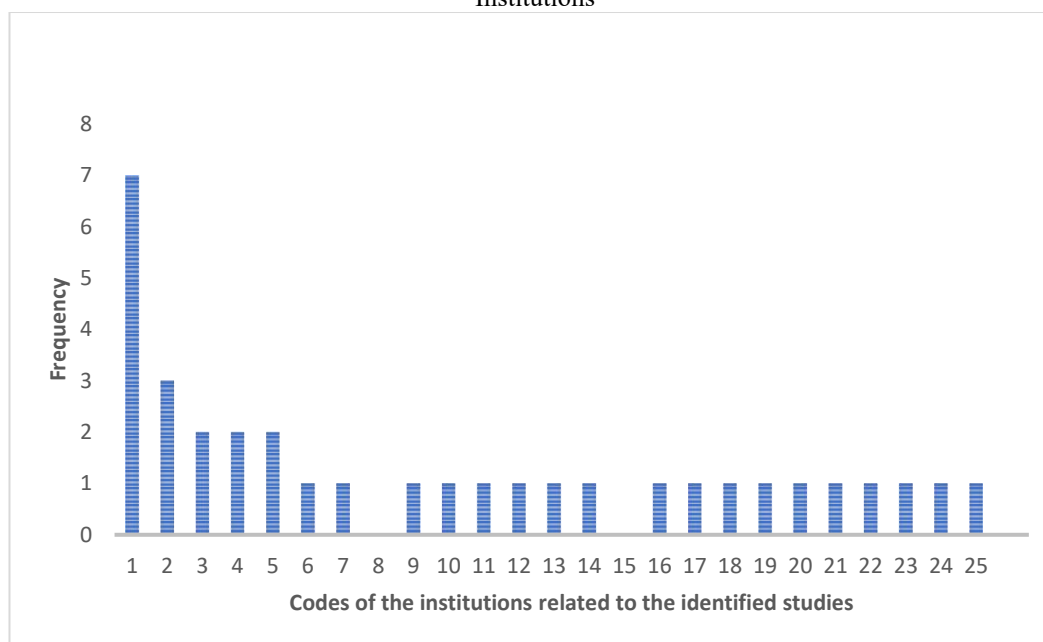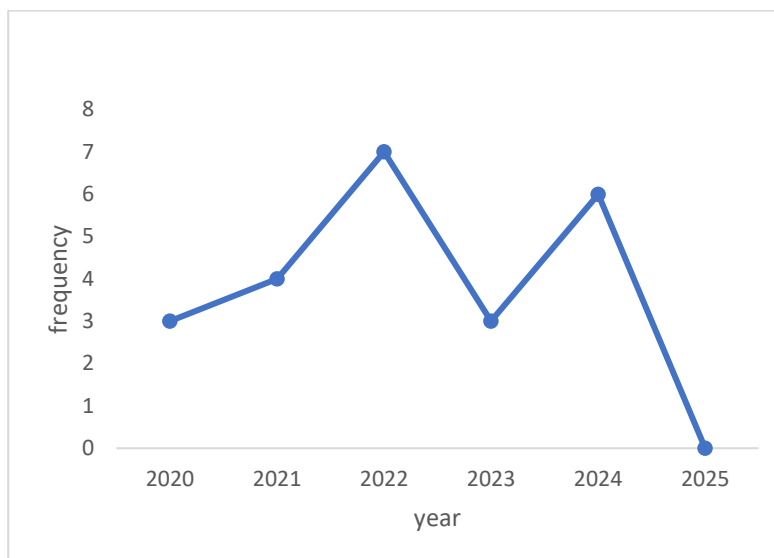

Source: Scopus database.

The numbers on the horizontal bar represent the codes of the institutions related to the identified studies and are organized as follows: 01: Universidade Nove de Julho; 02: Grupo de Pesquisa Metodologias em Ensino e Aprendizagem em Ciências; 03: Universidade do Estado do Rio de Janeiro; 04: Universidade Estadual de Maringá; 05: Universidade Federal do Rio de Janeiro; 06: Arche Scientific and Editorial Consultancy; 07: Association Friends of Nature of Alta Paulista; 08: Associação Acadêmica de Propriedade Intelectual; 09: Associação Acadêmica de Propriedade Intelectual; 10: Associação Brasileira de Pesquisa (Auto)biográfica (Biograph); 11: Editora Univates; 12: Fundação Universidade Federal de Mato Grosso do Sul; 13: Instituto Federal do Rio Grande do Norte; 14: Pontifícia Universidade Católica do Rio de Janeiro; 15: Programa de Pós-graduação em Geografia (PPGEO); 16: Programa de Pós-graduação Mestrado em Enfermagem da Universidade Federal do Piauí; 17: SciELO; 18: Servicios Académicos Intercontinentales Universidade de São Paulo; 19 & 20: Universidade do Estado da Bahia; 21: Universidade Federal de Santa Catarina; 22: Universidade Federal da Grande Dourados; 23: Universidade Federal de Minas Gerais; 24: Universidade Federal de São Carlos; 25: Universidade Federal do Rio Grande

The data reflects the reality of social technologies in Brazil, highlighting a concern for the most vulnerable populations, especially since the 21st century. This perspective drives public policies that impact the development of outreach projects by Higher Education Institutions (HEIs) (HOFFMANN, 2023).

The low level of academic production on this topic is noticeable. For this situation to improve, it is necessary to rethink the universities' outreach activities. Dagnino (2004) argues for the need to promote a new institutional culture that favors Social Technologies (STs), enabling a research and human resources training agenda aligned with Social Innovation (SI), solidarity economy, and STs themselves, to expand their space within projects driven by various social actors in line with Convergent Technology (CT).

Figure 2 presents a timeline of publications over the last six years on social technologies in HEIs, showing that the highest number of publications occurred in 2022, followed by 2024. The timeframe allows for observing the frequency of publications.

Figure 2: Annual distribution of scientific productions on social technologies in Higher Education Institutions

Source: Scopus database.

The academic production identified corroborates the study by Cultri and Bazilio (2021), which found 83 instances of production on social technologies between 2001 and 2017. This highlights the growing relationship between digital culture and social technologies, as well as a possible improvement in outreach policies.

Rosa and Strieder (2021), corroborating other authors like STRIEDER (2012), point to the need for greater production on university outreach practices, emphasizing the scarcity of evidence in the scientific field and the need for greater technical and scientific integration and concern regarding social problems.

Table 1 presents the authors, titles, and objectives of the research found, highlighting the purposes of the studies on social technologies in HEIs, emphasizing the technologies used and the problems they seek to solve. It's noteworthy that digital communication technologies are used significantly more than other technologies.

Table 1: Scientific production on social technologies in Higher Education Institutions

Authors	Title	Study Objective
E.D.B Menezes, Andréa Soares Rocha da Silva	Emergency remote teaching in higher education institutions and the technologies adopted: an integrative review	To analyze emergency remote teaching and the use of technologies that enable it in higher education institutions within the context of the COVID-19 pandemic.
Fernanda Edileuza Riccomini et al.	Virtual learning environments: a study of the best HEIs in the world	To research and describe virtual learning environments (VLAs) among the most recognized HEIs worldwide, according to the Times Higher Education (THE) World University Rankings (WUR) 2018.
Ronaldo Augusto Campos Pessoa, Thainá Nunes Pires Santana	Teaching and learning in the digital technology era	To highlight effective inclusion and the interactive digital process. Digital inclusion enables quality education in higher education institutions.
Matheus de Castro e Silva, Penha Souza Silva	A parallel between planning face-to-face and remote activities in the initial training of chemistry teachers involving the conservation and restoration of cultural heritage	To discuss the path of initial training activities for sixteen chemistry undergraduates and two pedagogy students in a set of remote discipline activities involving the integration of art and science, based on the conservation and restoration of cultural heritage.
Milka Alves Correia Barbosa, et al.	The influence of institutional conditions of public universities on the development of teachers' electronic competencies in higher education	To analyze how the development of electronic competencies among higher education teachers is related to the conditions of the organizational context of HEIs.
Fabiano Da Silva Yoiti Kanadani et al.	The knowledge management cycle as support for the technology transfer process	To propose potential contributions of the knowledge management (KM) cycle to the process of technology transfer (TT) developed within an HEI to the market.
Marcelo Stemposki Filho, et al.	Internationalization in Paraná	To investigate how mobility is presented in the official documents of the seven state universities in Paraná.
Josyanne Pinto Giesta, Alfredo Costa Neto, Thalita Giesta Costa	Experience report	To present the process of implementing BIM within the Civil Engineering course at the Instituto Federal do Rio Grande do Norte (IFRN) – Campus Natal Central (CNAT),

		pointing out the difficulties faced, the solutions adopted, and the results that are being achieved with the first class.
Eliane Fernandes Pietrovski, et al.	Methodology of management for the technological innovation centers	To present a management methodology for the Technological Innovation Centers (NITs) in Higher Education Institutions (HEIs).
Maria Cristina Alves de Lima, et al.	Aspects of sustainable training in engineering courses: a literature review	To present fundamental aspects in the training of civil engineers, considering sustainable development and the need to modernize the construction industry.
Diego Kenji de Almeida Marihama, et al.	Technological competencies: a study with distance learning teachers	To analyze the level of technological knowledge of teachers who work in distance education (EaD) in higher education institutions in the south of Minas Gerais state, Brazil.
Braian Veloso, Camila Dias de Oliveira, et al.	Hybrid education and digital culture: reflections on teaching, learning, and technologies in contemporary times	To propose a deep and comprehensive discussion about the role and interaction between education, digital culture, and emerging technologies in the current context.
Geraldo Ranthum, Guataçara dos Santos	Technological platform to support the management of *stricto sensu* postgraduate program graduates	To describe a technological platform developed to monitor graduates of *stricto sensu* postgraduate programs, aiming to support the management activities of this level of education in Higher Education Institutions (HEIs).
Marília Gabryelle Guimarães de Macêdo, et al.	Digital information and communication technologies as a tool for the dissemination of science - an alternative in times of the COVID-19 pandemic	To report this experience and describe the profile of participants with an interest in acquiring knowledge in these areas through the use of digital technologies.
Camilo Darsie, et al.	Regional differences in the use of technologies in higher education in health during the COVID-19 pandemic	To verify the use of Information and Communication Technologies (ICT) by undergraduate, postgraduate, and health course students and teachers in the five regions of Brazil, during the pandemic, to contribute to the discussion on the Brazilian situational diagnosis.
Ana Paula Silva Ducatti, Ana Lívia Cazane	Perception of a method that integrates the curricularization of outreach and in-person presence in higher education distance learning courses	To evaluate the students' perception of the practice method of curricularization of outreach in distance learning (MPCE-EaD), implemented in an HEI located in the state of São Paulo.
Tanisse Paes Bóvio Barcelos Cortes, et al.	Perspective of trainers	To understand how ICT topics and their developments (media culture, digital culture) are inserted into undergraduate degrees, from the perspective of media education.
Raphael De Carvalho Ferreira, et al.	The panorama of the patent process for noise control technology in Brazil	To present an introductory overview of the Brazilian industry in the area of acoustics and vibration, by surveying national and foreign companies that develop technologies in this area, as well as higher education institutions that offer training in these specialties to their students and have expertise.
Erinaldo Silva Oliveira, Karla Saraiva	Endless learning and loss of prestige of higher education institutions	To discuss an argumentative strategy that claims that higher education institutions can no longer ensure learning that guarantees a place in the job market.
Rogério Aparecido Teixeira Da Silva, et al.	Data analysis of academic works from the northern region of Brazil using the farthest first clustering algorithm	To examine a dataset composed of academic works in the area of informatics and technologies from the northern region of Brazil, aiming to extract relevant information about the research developed in public higher education institutions.
Carla Francini Fagundes Jacobi, et al.	Hybrid teaching and its contributions in higher education: mapping of Brazilian theses and dissertations	To understand how Brazilian productions (theses and dissertations) address the topic of hybrid teaching and what their contributions are to higher education.
Cristiane Vieira da Silva, et al.	Technological showcases as a repository and support for technological innovation centers in federal institutes	To present the results of the process of building a digital platform in the format of a technological showcase for the Instituto Federal do Pará – IPFA, to exhibit the technologies produced in the institution's professional master's courses.
Arnold de Araújo Freitas, et al.	Digital practices to minimize the impact of COVID-19 on educational institutions	To analyze the perception of the administrative technical staff of the Instituto do Noroeste Fluminense de Educação Superior (INFES/UFF) regarding the performance of activities related to information and communication technology (ICT) and their daily lives during remote work.

Source: CAPES Journal database, 2025.

It's been observed that there's a higher incidence of academic productions on Information and Communication Technologies (ICTs), indicating a greater interest from researchers in this area. The studies have focused on teaching and learning processes, especially in remote education, aiming to qualify, measure, or improve this mode of teaching.

ICTs are understood as technologies that facilitate communication between people and the development of remote work. According to Ponte (2000), ICTs can be used as facilitators of social technologies, transforming into STs when applied to solve social problems and contribute to community development. Thus, ICTs are not,

by themselves, social technologies, but they enhance and enable their application, creating an environment and infrastructure for STs to reach a larger number of people.

Another finding is the correlation between studies produced in the post-COVID-19 pandemic period. Social isolation seemed to be a contributing factor to the shift in studies towards technological tools for remote teaching.

The method applied allowed for the identification of an absence or low production of studies related to STs in HEIs, especially in the national context, highlighting the need for more research. It's not possible to state that the application of STs doesn't occur in HEIs, but the academic production is still limited.

This data corroborates the study by De Almeida (2010), who emphasizes the need for Brazilian universities to rethink their approach to social reality, promoting inclusion and concerning themselves with the problems of social exclusion.

Higher Education Institutions (HEIs) need to develop a more effective social consciousness, assuming a cultural commitment aimed at transforming the reality of peripheral populations. This requires greater involvement of the academic community in the search for solutions to the challenges faced by these groups, through the application of scientific knowledge and a critical analysis of public policies aimed at social assistance. According to Cruz et al. (2011), this movement implies bringing HEIs closer to the most vulnerable sectors of society, promoting a more active and responsible role in fostering social justice.

V. FINAL CONSIDERATIONS

It was found that the social technologies produced and published in Higher Education Institutions (HEIs) are primarily related to digital communication technologies. These are used as tools for teaching and education, contributing to the educational process and promoting access to learning.

There is a need to expand the academic production on Social Technologies (STs), and a reflection on the axes of teaching, research, and outreach in HEIs is crucial. In recent years, the production and publication of studies related to STs have been concentrated in federal universities.

This study is intended for readers, academics, and HEI professionals interested in understanding how institutions are developing social technologies.

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