

Categorizing Scientific Publications according to SDGs: A methodology proposal

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Abstract

Nowadays, there is a need for a more in-depth analysis of universities or graduate programs scientific productions and how these articles can boost and contribute to the advancement of the 2030 Agenda. In this context, the objective of this study is to present a methodology for categorizing scientific articles published by a particular higher education institution in relation to the SDGs. A methodology was designed in order to not require the use of complex software so that it could be used by several researchers. In this way, a bibliometric methodology is presented and tested in order to carry out an exploratory-descriptive research on the scientific production of a given post-graduation program, categorizing the scientific publications according to the 17 SDGs. As results, beyond the proposal of the methodology itself, the scientific production of a Master Program was analyzed and categorized in order to test the presented methodology.

Keywords: Sustainable Development Goals; Universities; Methodology; Categorization; Bibliometrics.

1 Introduction

The concept of sustainable development is based on actions designed so that progress can occur in harmony with nature, ensuring quality of life for both the current and future generations (BRUNDTLAND, 1987). For this purpose, The United Nations (2015) developed the 2030 Agenda, which has goals divided into 17 Sustainable Development Goals (SDGs). For their establishment, a set of universal purposes was used as a central focus that would meet the main current global challenges in the environmental, social, political and economic spheres. Beyond a merely ideological agenda, the 2030 Agenda is a commitment to a common ideal for the improvement of the human condition in all aspects, aiming at social justice and equality (UNITED NATIONS, 2015). In summary, the SDGs aim to end poverty, hunger and inequality; reduce climate change and negative environmental impacts; improve access to health and education; and contribute to strong institutions and partnerships, among others, by 2030.

Among the Sustainable Development Goals aimed at the quality of education, responsibility that higher education institutions can have in achieving the SDGs is highlighted (UNESCO, 2017). It is recognized that, despite the fact that the Sustainable Development Goals have a global approach, actions need to be developed within each program, university, state or country. Thus, each program of a given educational institution can help in research related to the achievement of the SDGs, adding individual efforts - of a given program or institution - so that collective goals are achieved.

The focus of the study is justified due to difficulties and problems found in other studies whose bibliometric methodology was applied. In these categorizations, broad and complex studies are found, which have the requirement to be indexed in databases, or even the combination of several sources of databases to achieve reliability for analysis; use of complex and paid software; difficulty in finding keywords that link directly to an SDG, among other adversities.

In view of these observations, there is a need for a more in-depth analysis of universities or graduate programs, together with the mapping of scientific productions, considering the authors, thematic, and how these articles can boost and contribute to the advancement of the 2030 Agenda, challenge launched by the United Nations (2015), as well as which SDGs they fit into. With that, the objective of this study is to present a methodology of categorization in relation to the SDGs of scientific articles published by a determined institution of higher education. A methodology was chosen that did not require the use of complex software and that was easy to replicate so that it could be used by several researchers. After the presentation of the methodology, an application of the same was carried out based on the publications of a Postgraduate Program in Architecture and Urbanism to demonstrate in practice the application of the method.

This study is divided in 6 sections, the first of which was the introduction. As a second section, there is the theoretical framework explaining what are the goals for sustainable development, what is the role and how universities can implement SDGs, and also a comparative study with other universities that have already carried out similar studies. In the third section, the methodological procedures are presented. Next, the fourth section presents the results of the application of the proposed methodology, together with the data analysis. In the fifth section, final considerations and conclusions are presented.

2 Literature review

In this chapter, the main theoretical references that guided this study will be addressed. It is divided into three sections: the first addresses the sustainable development goals established by the UN 2030 Agenda; the second discusses the role of universities and scientific production in the search for sustainable development; and the third section presents some bibliometric studies of scientific production already carried out in other universities.

2.1 Sustainable Development Goals

In the debate on international development, there is currently an agenda that guides the theme, called “The 2030 Agenda for Sustainable Development”, which contains the Sustainable Development Goals (SDGs), addressing topics considered relevant for international development. The SDGs are the result of the evolutionary process of its predecessor agenda that indicated the Millennium Development Goals (MDGs), which had eight goals and twenty-one targets on topics such as hunger, poverty, education and infant mortality, discussions that have grown stronger at the end of the 20th century, with the end of the Cold War (JANNUZZI & DE CARLO, 2018).

The transition process to the new agenda began with the 2010 Review Summit, and was deepened at the United Nations Conference on Sustainable Development in 2012 (Rio+20), and as a result of this last conference, the document “The Future We Want” (UNITED NATIONS, 2012) was developed, evidencing the commitment of world leaders to sustainable development in economic, social and environmental dimensions.

During the 2015 Sustainable Development Summit, the development and adoption of the agenda that replaced the MDGs took place. The new agenda - the SDGs - consists of 17 goals, 169 targets and just over 230 indicators and was elaborated through political negotiations between the States for three years, including representations of academics, business groups, civil societies, non-governmental organizations, government and United Nations agencies, emphasizing, according to Nygard (2017), that these new goals belong to society.

According to Ban Ki-Moon, the then secretary general of nations, the idea would be for the successor agenda to the MDGs to move efforts so that the goals reach countries that face challenges and are lagging behind in their development, giving special attention to the rights and needs of most excluded and vulnerable (UNITED NATIONS, 2013). To this end, the 2030 Agenda has 17 integrated and indivisible goals, presented in Table 1, which balance the pillars of sustainable development: economic, social and environmental (UNITED NATIONS, 2015).

Table 1 - Sustainable Development Goals (SDGs)

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5	Achieve gender equality and empower all women and girls
Goal 6	Ensure availability and sustainable management of water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts*
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Source: United Nations (2015, p. 18-19)

Basically structured in five major areas, the SDGs are part of the action plan that will guide international development until 2030, having as elements: People – aiming to eradicate hunger and poverty and guaranteeing the dignity and equality of all; Prosperity – to ensure economic development, prosperous and full life, in harmony with nature; Peace – to promote societies free from violence, just and inclusive; Partnerships – necessary to implement the SDGs, prioritizing the needs of the least developed and most vulnerable; and Planet – seeking to build sustainable livelihoods and consumption, in order to guarantee the natural resources and climate of our planet for future generations (UNITED NATIONS, 2015).

Due to the extent and universality of the goals there are obstacles, but the purpose is to dedicate efforts in the hope of a better world, considering that this change is adopted by the entire global community and that they can work to achieve the goals of the 2030 Agenda, ensuring the fate of the planet, without anyone being left behind (UNITED NATIONS, 2015).

2.2 The role of universities and scientific production in the search for sustainable development

Universities have a prominent place in the attempt to suggest solutions to the challenge of facing serious world problems such as climate change, hunger and inequality. In this way, collaborating for the fulfillment of Sustainable Development Goals (SDGs) is also the role of universities. They, as promoters of knowledge and social development, have generated efforts to include and discuss SDGs in their programs and internal agendas, through teaching, research and extension practices.

However, the role of universities goes beyond institutional governance and the application of the SDGs internally. They stand as an important source of scientific studies and experimentation, in which interaction can contribute to the production and dissemination of knowledge as a basis for action. Kestin et al. (2017) point out that the performance of these institutions should be in the area of learning and teaching, providing students with knowledge, skills and motivation to understand and address the SDGs, within a context of “education for sustainable development”. Considering all the discussion, universities can contribute to the achievement of the SDGs as presented in Table 2.

Table 2 – The role of universities in achieving the SDGs

Management	Implementing the principles of the SDGs through governance structures and operational policies and decisions, such as those relating to employment, finance, campus services, support services, facilities, procurement, human resources, and student administration.
Extension	Providing the necessary knowledge, evidence-base, solutions, technologies, pathways and innovations to underpin and support the implementation of the SDGs by the global community; providing capacity building for developing countries in undertaking and using research; collaborating with and supporting innovative companies to implement SDG solutions; improving diversity in research; and student training for sustainable development research.
Teaching	Providing students with the knowledge, skills and motivation to understand and address the SDGs (broadly ‘education for sustainable development’); providing in-depth academic or vocational expertise to implement SDG solutions; providing accessible, affordable and inclusive education to all; providing capacity building for students and professionals from developing countries; and empowering and mobilizing young people.

Source: Adapted from Kestin et al. (2017).

In 2015, the Brazilian network of “Sustainable Development Goals Universities” was launched in Brazil (ODS Universidades, 2015) as an initiative of academic and research institutions which through their articulated and coordinated action established an agreement that consisted of “strengthening teaching, research and extension activities that promote sustainable development, in line with the 2030 Agenda (UNITED NATIONS, 2015). The network's goals are also directly related to the national university extension policy and the extension policy of each institution.

The network's premises are: to encourage the creation of an institutional culture that includes education for economic, environmental, cultural and socially responsible citizenship; to articulate the performance of inter-institutional activities; to promote actions for the exchange of experiences; to publicize actions carried out by institutions through various communication channels; to promote the discussion of political, ideological, theoretical and educational foundations of the SDGs; to act as a point of consultation and support for institutions committed to the implementation of the SDGs; to promote dialogue between institutions and the United Nations Development Program (UNDP); to promote dialogue between governmental and non-governmental institutions and bodies; and to create a network of experts for the implementation of the SDGs in the country (ODS Universidades, 2015).

The challenges and scenarios of university extension regarding the lines of action of 2030 Agenda are enormous and it is up to each institution to choose the path it wants to follow, which can be one marked by a close bond with the society in which it is inserted. Higher education institutions occupy a prominent place in society, with an undeniable role in the creation and diffusion of knowledge, powerful drivers of global, national and local innovation, economic

development and social well-being. There is an increasing expectation that research (and education) will contribute to solving imminent and urgent challenges and science, potentially, has the power to offer solutions to problems originated in social aspirations, as is the case of the current pandemic of COVID-19 (BUCKERIDGE; PHILIPPI JR., 2020).

Efforts to achieve the SDGs are spread across all strata of society. As an objective, a ranking prepared by the international research institute Times Higher Education (THE), responsible for some of the main rankings of higher education institutions in the world, evaluates which universities are most aligned with the SDGs. The Dean of São Paulo University (USP), Vahan Agopyan highlights that Universities around the world have been increasingly concerned with showing the importance of their impact in the social context and for the formulation of public policies, therefore, this ranking is an important initiative to increase the participation of universities and exposes the concern of institutions in presenting their investments to promote the 17 UN SDGs (SÃO PAULO, 2021).

In summary, educational institutions undoubtedly have a privileged role in participating in decision-making in relation to the SDGs, facilitating dialogue and intersectoral actions and helping to design public policies based on sustainable development. In this way, universities become protagonists in the modification of social and urban reality.

2.3 Bibliometric studies of scientific production in universities

We are in the “Decade of Action”, a period identified by the UN between the year 2020 and 2030 that reiterates the commitment to accelerate actions to achieve global goals (UNITED NATIONS, 2020). Guided by the 17 SDGs, universities have played an important role in research and dissemination of strategies for the dissemination of these goals stipulated by the UN. In this section, studies carried out by prominent universities in the national scenario that categorize actions or publications regarding SDGs will be described.

At the University of Santa Maria (UFSM), extension actions related to the SDGs are described on a website and there is still a pdf material (UFSM, 2021) that cites and lists the SDGs and the activities developed by the institution. Such actions are present in 150 Brazilian cities, in 11 states and also in the Federal District. Four countries in Latin America and Europe also have UFSM extension projects. In 2021, the Dean of Extension integrated this mapping into the 2030 Agenda. This map then presents the extension activities that cover the theme of one of the 17 Sustainable Development Goals. Having these data collected helps to advance the goals presented in the 2030 Agenda agreement. Although the extension actions are categorized, publications are not included in this study.

The Universidade Estadual Paulista prepared a guide entitled “Agenda 2030 Guide - Integrating SDGs, Education and Society” (our translation) (UNESP Institutional Repository, 2020) carried out through an agreement created between UNESP and the University of Brasília (UnB). The SDGs are presented individually and, in each SDG presented, there is a text explaining what each SDG is and then good practices aligned with the SDGs that are carried out by the university are listed, with a brief explanation and also links to learn more about each project.

3 Methodology

Recent literature has begun to recognize the potential value of using the SDGs as a means of measuring research impact (BEBBINGTON & UNERMAN, 2018; LEAL FILHO et al., 2018). So, in order to investigate and catalog the main SDGs addressed in the scientific production of higher education institutions, it is interesting to analyze the publications carried out in a given period of time by a specific graduate program or an institution as a whole.

Thus, a methodology to perform such quantitative analysis will be presented below. The test study to check the proposed methodology was carried out based on the professors' publications of the *Stricto Sensu* Graduate Program in Architecture and Urbanism at ATITUS carried out in the four-year period from 2017 to 2020. The methodological approaches of this study were divided into bibliographic research on the theme and quantitative bibliometric analysis.

In order to understand the terms of the bibliographic review, aiming to present the main concepts related to the theme, searches were carried out in books, journal publications and digital documents available in the most varied virtual libraries. The presentation on what it is, and what are the objectives for sustainable development, what role and how universities can implement the SDGs, and also studies of other universities that have already carried out similar studies internally, consist on the theoretical references.

Next, an analysis of scientific production was developed through a bibliometric analysis, which is a statistical technique applied to data from publications that allows examining the evolution of knowledge on a given topic during a given period of time (Keathley-Herring et al., 2016; ReyMartí et al., 2016). According to Araújo (2006), bibliometric analysis consists of a quantitative and statistical technique for measuring the indices of production and dissemination of scientific knowledge, envisioning the quantitative analysis of bibliographic information.

Bibliometric analysis is a research technique used to reveal trends and identify thematic groupings in the literature through the use of software using information collected in databases of bibliographic records (Van Eck & Waltman, 2010; Merigó et al., 2016). Vanti (2002) complements stating that some primary objectives of bibliometrics are: (a) to identify trends and growth in the production of scientific knowledge in an area; (b) to predict publication trends; (c) to identify the individual productivity of authors, organizations (institutions) and countries; (d) to analyze the citation and co-citation processes; (e) to understand the possibilities for developing new research.

The use of this approach is justified by the fact that the research was developed with the objective of expanding the knowledge regarding the publications of the universities, related to the theme of the SDGs, from the survey of articles that deal with the subject. In this way, this chosen technique makes it possible to meet the following central questions of the study: What are the main themes and goals being targeted by the scientific production of the *Stricto Sensu* Graduate Program in Architecture and Urbanism at ATITUS Educação? Are one, more than one, or no SDGs being addressed? Do the authors have a focus on any specific SDGs? How can publications be classified?

Thus, the work was carried out in 4 stages. First, all articles published in journals by the professors of the chosen program were selected over the four-year period of 2017 and 2020. This period can be changed at the researcher's wish to measure longer or shorter periods of analysis.

The professors of the overmentioned program were listed and a search on the Lattes Platform of each of them was carried out to verify the publications in periodicals of each one in that period. In the case of ATITUS, professors are instructed to always keep the Lattes platform up to date. The articles were copied and pasted in a spreadsheet software (Excel), for better visualization and also to facilitate their classification. In this same stage, an investigation was also carried out to locate duplicate articles. This is because, as it is the same program, many articles have the same authors or co-authors and are listed in both researchers' Lattes. After excluding duplicate articles, 118 articles were found within the stipulated criteria.

In the second stage, a separation of these articles launched in the spreadsheet was carried out, since when they are obtained from the Lattes Platform, the publications come unformatted in plain text. Thus, criteria were selected that would facilitate the identification of article names, authors, place of publication and year. These criteria were included in new columns in the spreadsheet and all articles were categorized based on these criteria. In this way, the sampling of the study database was refined, thus helping in the next steps.

The third stage was formed from the identification, categorization and evaluation of this sample of scientific production. It was divided into two moments, in the first an evaluation was made about which SDG was met, from the textual analysis of the article's title, in case it specifically transpired the area of activity. In a second moment, if the name did not allow this understanding, the abstract and the keywords were evaluated.

The keywords used for the categorization were searched through the Excel spreadsheet search engine in the titles, abstract and keywords of the analyzed articles. The words to perform the searches were taken from the research by Belmonte-Ureña et al. (2021) and are shown in Table 3. In that article, the authors mention the need to add new keywords to this table, as it is possible that they have words that are not mentioned that can also represent the themes of the SDGs. However, as the focus of the present study is to opt for a leaner and more simplified methodology, only the keywords described by Belmonte-Ureña et al. (2021) in English and Portuguese were used, since several articles had titles in Portuguese in the analyzed sample. However, variations of these words contained in the table, such as gerunds and synonyms, were considered, so that it was possible to categorize most of the articles published by the professors of ATITUS. Articles that were not related to the 2030 Agenda based on the keywords listed were not categorized. Based on this mapping, the articles could fit into one SDG as a focus of study, two SDGs, or even none at all.

Table 3 - Keywords used to categorize each SDG.

Goal 1	Poverty, poverty alleviation, vulnerable population, multidimensional poverty, social protection, poverty determinant, poverty eradication, extreme poverty, population control, vulnerable communities.
Goal 2	Agriculture, food, malnutrition, nutrition, hunger, nutritional status, agricultural productivity, food prices, livestock, undernutrition.
Goal 3	Health, wellbeing, global health, health care delivery, mortality, maternal mortality, health care planning, epidemic, disease control, infection.
Goal 4	Learning, education, students, training, teacher, teaching, school, primary education, secondary education, skills.
Goal 5	Gender, empowerment, women, gender equality, sexual violence, women empowerment, reproductive rights, violence against women, female autonomy, female empowerment.
Goal 6	Water, sanitation, hygiene, waste water, wetlands, river basin, water stress, river, aquifers, lakes.
Goal 7	Energy, renewable energy, energy efficiency, energy access, electricity supply, electricity access, sustainable energy, clean energy, energy services, sustainable energy development.
Goal 8	Economic growth, commerce/trade, gross domestic product, growth, growth rate, employment, sustainable tourism/ecotour, labor, labour, earnings.
Goal 9	Research and development, innovation, industry, technology, infrastructure, manufacturing, industrial policy, sustainable industrial development, clean technology innovation, information and communications technology.
Goal 10	Social justice/equity, income, social inclusion, human rights, inequality, ethnicity, inclusion, inequalities, foreign direct investment, income inequality.
Goal 11	Urban study, housing, sustainable cities, community development, cultural heritage, urban agriculture, urban policy, slums, smart cities, peri-urban.
Goal 12	Resource use, natural resources, resource efficiency, resources, reuse, supply chain, waste management, sustainable consumption, production, recycling.
Goal 13	Climate change, emissions, pollution, pollution control, pollution tax, global climate, mitigation, climate change adaptation, decarbonization, greenhouse gases.

Goal 14	Acidification, aquaculture, marine policy, marine pollution, fishery management, fisheries, fishery policy, water contamination, ocean, eutrophication.
Goal 15	Biodiversity, species diversity, conservation, ecosystems, ecosystem services, reforestation, forestry, desertification, wildlife, mountains.
Goal 16	Governance, participatory approach, public participation, institutional development, institutions, violence, peace, corruption, anti-corruption, social conflict.
Goal 17	International cooperation, development cooperation, stakeholders, technology transfer, partnerships, cooperation, external debt, development policies, regional cooperation, knowledge sharing.

Source: Adapted from Belmonte-Ureña et al. (2021).

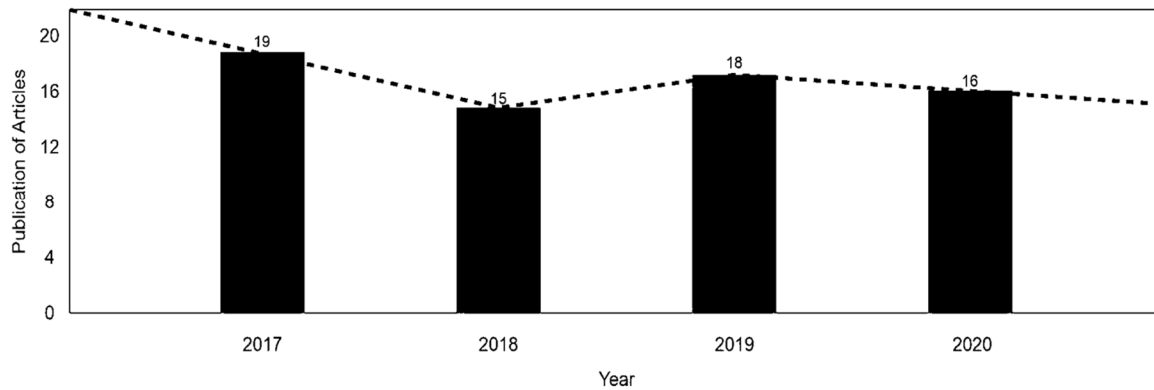
Based on the classification performed in the previous stage and on its bibliographic analysis, in the fourth stage, tables and graphs were developed. This stage was also carried out in the Excel program, which made it possible to visualize the concentration of areas of knowledge covered by the scientific studies carried out by the studied post-graduation program. In this way, it was possible to explore trends, statistics of authors and their publications, coincidences and associations between articles, and elaborate the discussion and the results obtained during the study.

4 Results and Discussion

From the analysis and subsequent categorization of the 118 articles in the list of publications of the professors who are part of the faculty of the *Stricto Sensu* Graduate Program in Architecture and Urbanism at ATITUS between the years 2017 and 2020, it was observed that 68 publications were related to any of the 17 Sustainable Development Goals, while 50 publications did not fit in any of the necessary criteria and did not receive categorization associated with the 2030 Agenda, being articles that, according to the criteria established by the methodology, do not cover the themes of the SDG

After classification, it can be seen in Figure 1 that there is a certain parity regarding the number of publications of articles related to SDGs over the years, with 2017 being the year with the highest number of publications (19 out of 68), followed by the year 2019 (18), 2020 (16) and, finally, 2018 (15).

Figure 1 - Period of publication of selected articles.



Source: Authors.

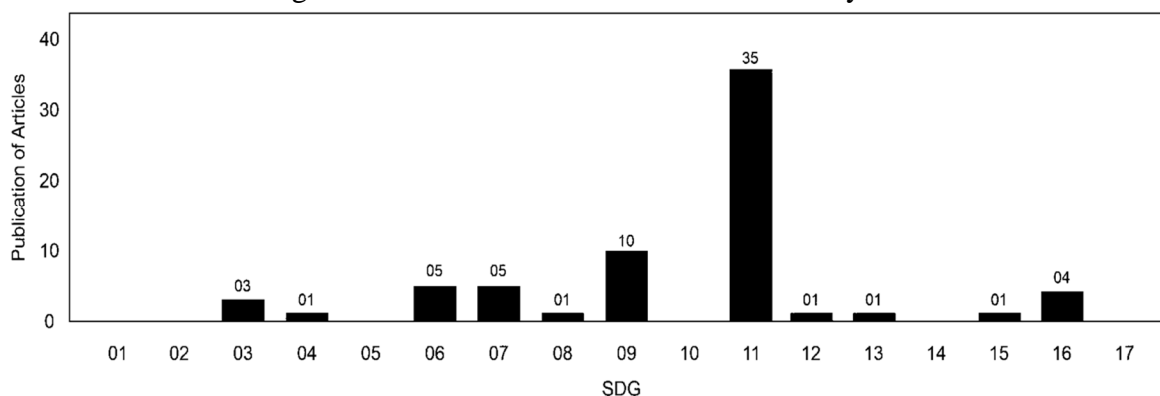
From the categorization, a list of publications distributed by 11 of the 17 SDGs was obtained, as shown in Figure 2, with most publications (35 of 68) falling under the theme of SDG 11: Making cities and settlements inclusive, safe, resilient and sustainable human beings, highlighting the theme of concentration of the master program analyzed with the sustainable development of cities, as well as access to quality of housing, making it adequate to the social reality and accessible to the population.

Subsequently, there is a high number of publications (10 of 68) related to SDG 09: Building resilient infrastructure, promoting inclusive and sustainable industrialization, and fostering innovation, referring to the importance given by researchers to innovation in infrastructure in cities.

Other SDGs that stand out among the selected publications are SDG 06: Ensuring availability and sustainable management of water and sanitation for all (5 of 68 publications), SDG 07: Ensuring access to cheap, reliable, sustainable and renewable energy for all (5 of 68 publications), SDG 16: Promoting peaceful and inclusive societies for sustainable development, providing access to justice for all and building effective, accountable and inclusive institutions at all levels (4 of 68 publications) and SDG 03: Ensuring a healthy life and promoting well-being for all, at all ages (3 of 68 publications).

Finally, with one publication ranked in each, there are SDG 04: Ensuring inclusive, equitable and quality education and promoting lifelong learning opportunities for all, SDG 08: Promoting sustained, inclusive and sustainable economic growth, sustainable development, full and productive employment, and decent work for all, SDG 12: Ensure sustainable production and consumption patterns, SDG 13: Take urgent action to combat climate change and its impacts, and SDG 15: Protect, recover and promote the sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse Earth degradation and halt the loss of biodiversity.

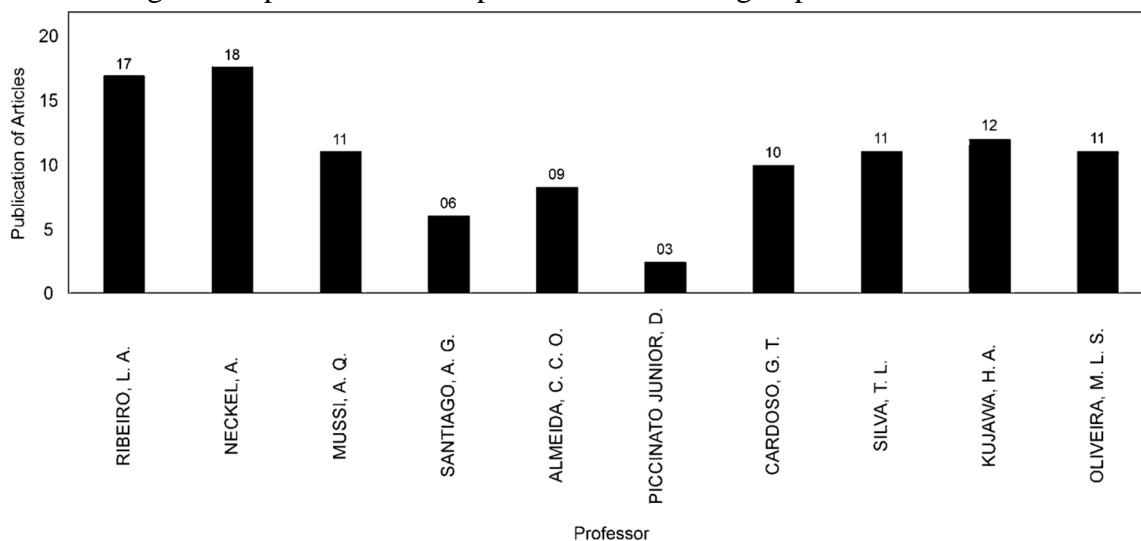
Figure 2 - Classification of selected articles by SDG



Source: Authors.

Also, Figure 3 shows the similarity in terms of the number of publications made by the professors classified among the above-mentioned SDGs. It is worth mentioning that the publications are authored by more than one researcher, therefore they are included in the classification of more than one professor.

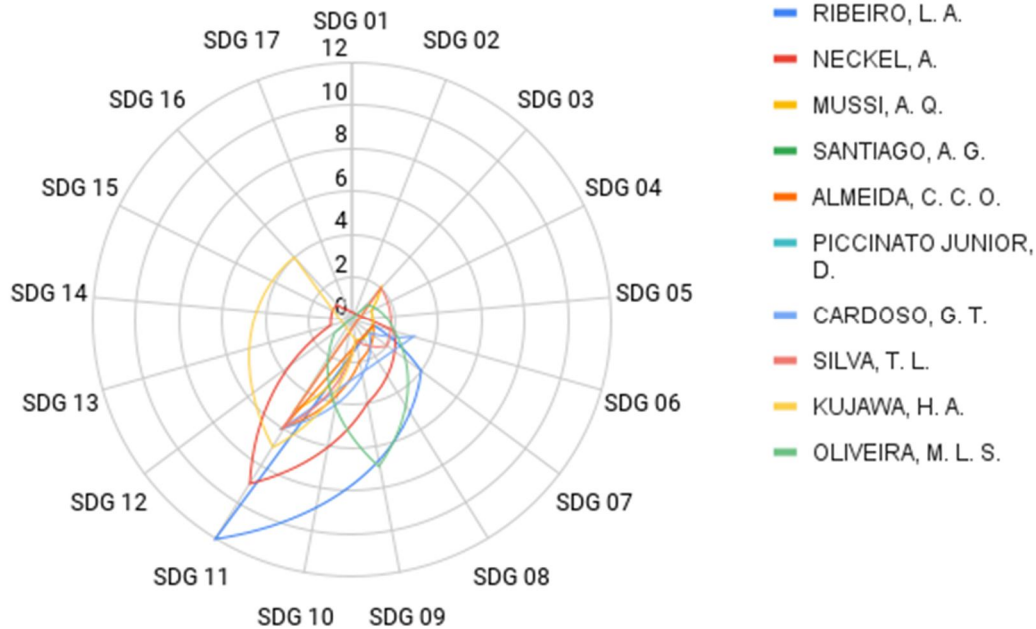
Figure 3: Spreadsheet example of overall ranking to present for students.



Source: Authors.

Furthermore, Figure 4 shows the radar chart showing the number of publications classified in each SDG per professor, directly pointing to the SDGs most published by each ATITUS researcher.

Figure 4 - Professor publications ranked by each SDG.



Source: Authors.

The analyses carried out give an example of some possibilities of results that it is possible to extract from the use of the database already organized according to the proposed methodology. Other analyzes and graphs may be performed according to the researchers' wishes and needs.

5 Conclusions

The analysis and categorization of articles seeks to contribute to future studies, objectives, different theories and authors, to continue seeking to meet the Goals for Sustainable Development. Therefore, the choice of the bibliometric method for this study aimed to support the systematization of scientific production on sustainable development, which can benefit the realization and implementation of the SDGs, mainly within scientific production, in the near future.

From the developed study, which aimed to present a methodology to analyze the scientific production of a given institution or program, it was possible to satisfactorily establish an analysis of the scientific production of the studied program, in a simplified way, using easily accessible software, which can influence present and future generations in a decisive way in the formation of an education based on the principles of sustainability.

The limitations of this work are also recognized, especially due to the fact that the research is associated with a relatively small database, as it is only a program within the university and only articles published in journals were considered. However, the application of the presented methodology is also possible for large volumes of scientific publications. This methodology can be replicated by the most diverse spheres of academic society that are interested in the categorization of their publications.

Finally, it is suggested for future work, based on the results obtained in the course of this study, the observation of the categorization functionality from the use of keywords. It is possible to study the addition of other keywords that are also related to the SDGs, as it is important to emphasize that this topic is still quite broad and open to many variations.

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