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Article

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Addressing sustainability in the context of library management: international literature review

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ABSTRACT

Introduction: The adoption of sustainability in people's routine and in the management activities of educational institutions is increasingly present. This research addresses the concept of sustainability applied to management activities in the library scenario. Objetivo: The objective of this study is to analyze, from a fragment of scientific literature, the content of the sustainability theme in the context of library management. Methodology: a literature review was carried out in three databases (Scopus, Web of Science, and SciELO), aided by the instrument called ProKnow-C; the research was developed with a qualitative approach and the results were analyzed using the Content Analysis technique. Results: the selection of the portfolio referring to the theme was represented by 23 aligned articles. After analyzing the content of the articles, among some of the results, it is highlighted that the concept of sustainability in the context of library management was represented by four main themes: Green construction, Information and Communication Technologies, Evaluation Models and Sustainable Practices applied simultaneously. Conclusion: to librarians, managers, and researchers in the field of librarianship is to clarify that this study categorizes theoretical and practical initiatives of the concept of sustainability applied to library management and that its use as a source of information can elucidate issues regarding this theme.

KEYWORDS

Sustainability. Library management. Green libraries.

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Abordagem da sustentabilidade no contexto da gestão de bibliotecas: revisão da literatura internacional

RESUMO

Introdução: a adoção da sustentabilidade na rotina das pessoas e nas atividades de gestão de instituições de ensino está cada vez mais presente. Esta pesquisa aborda o conceito de sustentabilidade aplicado nas atividades de gestão no cenário das bibliotecas. Objetivo: O objetivo deste estudo é analisar, a partir de um fragmento da literatura científica, os conteúdos do tema sustentabilidade no contexto da gestão de bibliotecas.

Metodologia: realizou-se uma revisão da literatura em três bases de dados (Scopus, Web of Science e SciELO), auxiliado pelo instrumento denominado ProKnow-C; a pesquisa foi desenvolvida com abordagem qualitativa e os resultados analisados com a técnica de Análise de conteúdo. Resultados: a seleção do portfólio referente ao tema ficou representado por 23 artigos alinhados. Após análise do conteúdo dos artigos, entre alguns dos resultados, destaca-se que o conceito de sustentabilidade no contexto da gestão de bibliotecas ficou representado por quatro temas principais: Construção verde, Tecnologias da Informação e Comunicação, Modelos de avaliação e Práticas sustentáveis aplicadas simultaneamente. Conclusão: aos bibliotecários, gestores e pesquisadores da área de biblioteconomia implica esclarecer que este estudo categoriza iniciativas teóricas e práticas do conceito de sustentabilidade aplicado na gestão de bibliotecas e que sua utilização como fonte de informação pode elucidar questões a respeito desta temática.

PALAVRAS-CHAVE
Sustentabilidade. Gestão de bibliotecas. Bibliotecas verdes.

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1 INTRODUCTION

Sustainability has become a concern present in all human activities, whether business, government, social or personal. The management of these activities needs to contemplate the social and economic dimensions, as well as, the negative impacts generated in the environment, which shows a great challenge to the planning of all entities (BRODIE, 2012; CHOWDHURY, 2014; EDWARDS, 2011; HAMAD; AL-FADEL, 2021; JANKOWSKA; MARCUM, 2010; MISSINGHAM, 2021).

Sustainability management must be conceived, managed and understood in a broad sense, so that the concept survives over time and is an active contributing factor to the development and progress of humanity (BEUTELSPACHER; MESCHEDE, 2020; KOSCIEJEW, 2020; THORPE; GUNTON, 2021; WILSON, 2012). As participative institutions in the teaching and learning process and aware of their responsibilities to society, libraries emerge as great partners in the promotion of sustainability in their activities.

The concern with the degradation of the environment and the well-being of mankind has led to numerous discussions worldwide that have given rise to positive initiatives to combat this problem. Thus, the concept of sustainability began to be frequently used in contemporary society and is related to the balance between meeting current needs without compromising the viability of the existence of future generations, keeping the economic, social and environmental aspects in a preservation perspective (ANASI; UKANGWA; FAGBE, 2018; CHOWDHURY, 2014; JANKOWSKA, MARCUM, 2010; WILSON, 2012). In the field of sustainability, three main initiatives are in place; environmentally sound sustainable development; economically sustainable development; and the development of socially sustainable actions; which included to the context of libraries, can make them environmentally sound environments and, "green" environments, are being demanded by the whole society (HAMAD; AL-FADEL, 2021; SINGH; MISHRA, 2021; SINGH; DIXIT, 2021).

Thus, in librarianship activities it becomes necessary to add different attributions, standards, and responsibilities that direct them towards the alignment of a management that is sustainable. The discussion of multidimensional issues of sustainability will provide to identify the needs for the development of an integrated framework of sustainable strategies in library management (CHOWDHURY, 2015; EDWARDS, 2011; JANKOWSKA, MARCUM, 2010; THORPE; GUNTON, 2021). Thus, it can be seen that libraries do not have the mission to become only an innovative environment that encourages learning and knowledge construction, but to have the green mission instituted in their management and provide mechanisms for user empowerment and awareness (TOWNSEND, 2014; KOSCIEJEW, 2020; BEUTELSPAHCER; MESCHEDE, 2020). However, the challenge for libraries is to define which individual and group skills, processes and routines, evaluation criteria and activities are necessary to improve performance, support decision making and achieve the objectives for the insertion of sustainability in their management processes.

Considering the perspective of libraries in acting towards sustainability and promoting sustainable management in their environments, it becomes important to identify how the scientific literature addresses the theme. With this understanding, the question of this research arises: How is the theme sustainability addressed in the international scientific literature considering the context of library management? To answer this question, the objective of this study is to analyze, based on a fragment of the scientific literature, the contents of the sustainability theme in the context of library management. The attainment of this objective was possible by performing a literature

review, aided by the intervention instrument called Knowledge Development Process-Constructivist - ProKnow-C, and by the qualitative analysis of the results with the Content Analysis technique.

This research is justified by its purpose of seeking to evidence theoretical and practical contributions to the area of Social and Applied Sciences, with emphasis on Librarianship. As a theoretical contribution, the study identifies, evaluates and synthesizes the relevant issues of usability of the sustainability concept applied to library management, providing researchers with the opportunity to identify "gaps" for future research on the subject. As a practical contribution, it is understood that the construction of knowledge in this area will add relevant information for librarians and managers, highlighting proposals for the applicability of sustainability in the context of libraries.

2 THEORETICAL REFERENCE

The purpose of this section is to complement the knowledge of the themes Sustainability and Library Management based on the scientific literature; thus, it is subdivided into: 2.1 Approach to the theme sustainability; 2.2 Context of library management.

2.1 Approach to the theme of sustainability

The term sustainability began to spread worldwide when the United Nations Conference on the Human Environment was held in Stockholm, Sweden, in 1972. The goal of the conference was to discuss issues related to the preservation of the environment and humanity - the main result was a document-synthesis entitled "Only one World", which united the concepts of economic growth, nature preservation and social development, previously discussed separately (UN, 2022).

Sustainable development encompasses three fundamental dimensions that are interrelated and complementary: the economic, the social, and the environmental, which represent the basic dimensions of sustainability (ANASI; UKANGWA; FAGBE, 2018; CHOWDHURY, 2014; WILSON, 2012). The sustainability approach aims to involve all citizens in an integrated, long-term planning process to protect the environment, expand economic opportunities, and meet social needs (JANKOWSKA, MARCUM, 2010).

In 1987, the Brundtland Commission published an innovative report called "Our Common Future". Among some of the guidelines, the concept of sustainable development came into the public domain: "sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (UN, 2022, p. 1).

In 1992, at the Conference on Environment and Development, held in Rio de Janeiro - Brazil, the concept of sustainable development was effectively incorporated as a guiding principle for future actions and, along with the development of Agenda 21, the commitment of countries to act cooperatively and harmoniously in the pursuit of sustainable development was signed (UN, 2022).

In the scientific literature, it can be seen that the essence adopted and disseminated by the UN regarding the concepts of sustainable development and sustainability remains. In some studies, it is noted that the sustainability approach creates and ensures conditions under which humans and nature can exist in productive harmony and which allow the social, economic and environmental requirements of present and future generations to be met (CHOWDHURY, 2014; JANKOWSKA; MARCUM, 2010; LE BER; GREGORY, 2004; SINGH; MISHRA, 2019).

With regard to ecologically sustainable development, it aims at development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ANASI; UKANGWA; FAGBE, 2018; BRODIE, 2012; KOSCIEJEW, 2020; PIONKE, 2016).

In practice, sustainability is related to the ability of humans to remain in an environment without causing harmful impacts to it, constituting actions that aim at the rational use of resources (BOYDEN; WEINER, 2000; SILVA; KARPINSKI, 2019). The intention is that natural resources are used intelligently, in a collaborative way, meeting the essential needs of people, but that they are preserved for future generations.

Another point to be highlighted is with regard to the Sustainable Development Goals (SDGs); their insertion occurred at the Conference held by the United Nations in 2015 in New York City, United States, which brought together heads of state and government from 193 member countries. At this meeting, the SDGs were adopted as a roadmap for the fulfillment of the "2030 Agenda" (the year in which the goals would need to be achieved), directing countries to build a more peaceful world, reduce inequalities and promote human rights, and protect the planet and its natural resources (UN, 2022); Figure 1 illustrates these goals.

Figure 1. Sustainable Development Goals - SDGs

Source: ONU (2022)

The SDGs are made up of 17 goals and 169 targets that reflect the concerns of the world's nations and require international cooperation in building a just, prosperous, sustainable and equitable world by 2030. Sustainable development is the concept of needs, in particular, the needs of the world's poorest people; and the SDGs are geared toward just, inclusive, and sustainable human development (ANASI; UKANGWA; FAGBE, 2018; STILWELL; HOSKINS, 2012; THORPE; GUNTON, 2021).

The goals and targets outlined by the SDGs cover different categories - economy, education, environment, sustainable development - their acceptance will provide to end poverty, fight inequality and injustice, ensure people's peace, innovate and, above all, protect the planet (HAMAD; AL-FADEL, 2021; MISSINGHAM, 2021). The adoption of the SDGs enables organizations to assume a relevant role in mitigating the risks generated

to the environment and, consequently, contribute to the preservation, well-being, and quality of life on the planet.

However, it is understood that to consolidate the sustainability approach in the daily lives of people and organizations, awareness and applicability are necessary. Society's understanding of the principles of sustainability aims at development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. (JANKOWSKA; MARCUM, 2010; SINGH; MISHRA, 2019). Thus, since sustainability aims at the conscious use of natural resources and assets, it is evident that the application of the concept in practices will bring environmentally expressive results to current and future generations.

2.2 Context of library management

Traditionally, libraries are institutions constituted with the purpose of supporting a certain public, providing access to publications and offering spaces to stimulate the coexistence and interaction of users, in addition to encouraging research and reading activities. Libraries play the role of providing information resources that meet the informational needs of their community, supporting the teaching and learning process (DIAS, 2017; HAMAD; AL-FADEL, 2021). In turn, libraries, in most communities, are the only means for people to access information, improve their education, acquire new skills, make information-based decisions, and gain understanding of pertinent issues (ANASI; UKANGWA; FAGBE, 2018).

As basic activities in libraries, there are: (i) Formation and development of knowledge: includes administrative procedures corresponding to the collections, memory of scientific and technological production, preservation and conservation; (ii) Organization of knowledge: includes technical processing activities, representing with quality the thematic and descriptive treatment of information; (iii) Access to knowledge: includes the service of users (training, assistance etc.), and availability of spaces enabling simultaneous access for all; and (iv) Managerial functions: includes the monitoring and administration of all actions, intervening in the activities and collaborators (ANNA, 2018; FUJITA, 2005).

Libraries are spaces that keep recorded human memory and have the responsibility to provide management that facilitates access to information and contributes to the development of a more humane and dignified society. The management activity represents a set of actions, interrelated, that aims to achieve satisfactory results for the community and, in parallel, meet organizational expectations (ANNA, 2018; DZIEKANIAK, 2009). The management activities in a library are those with administrative characteristics and that are responsible for directing and achieving the goals and objectives previously established by the manager.

For this, the adoption of a set of concepts and techniques that can represent the management developed in a library is necessary. As an example, it is presented the study by Dziekaniak (2009), which groups a set of six management subsystems (Figure 2).

Figure 2. Subsystems of library management

Source: Adapted from Dziekaniak (2009)

Dziekaniak (2009, p. 38) describes library management subsystems as follows:

> **Institutional Subsystem** (Library Philosophy) - business: explain the area(s) of activity; vision: the purpose and/or commitment with the Educational Institution; mission: represents what the organization wants to be, idealization of the future; principles: convictions of support the administrative actions**;** **Managerial Subsystem** - establishes the results to be achieved; assists in the implementation, verification and evaluation of actions; defines the products offered and administrative functions (Planning, Direction and Control); **Operational Subsystem** - helps the administrator to define which activities are indispensable, their purposes and how they will be executed (Internal and External Activities); **Organization subsystem** - involves the distribution of functions, organizational structure, authority level and people responsible for the functions; **Human-Behavioral subsystem** - mobilizes people and seeks adequacy of individual and collective behavior to the requirements of the activities (motivation, activation and integration of people); and **Environmental subsystem** - defines environmental actions; composed of environmental policy, action plan, implementation, mediation and evaluation, critical analysis and continuous improvement.

As presented, the management of libraries comprises a set of integrated subsystems that enable the realization and management of activities, the establishment of responsibilities to professionals, the effective control of processes and actions with environmental characteristics. For these management actions to be carried out consistently and efficiently, it becomes necessary the participation of a qualified professional who holds knowledge, techniques, and methodologies about administrative principles (ANNA, 2018; DZIEKANIAK, 2009).

In the case of libraries, the librarian, for having training in administrative techniques and specialized knowledge in the organization of library products and services, is the most appropriate professional to act in management activities. Librarians are the main actors in library management and perform their role of acquiring, organizing, and disseminating knowledge in a proactive and enhanced way to users (ANASI; UKANGWA; FAGBE, 2018; BEASLEY; ROSSEEL, 2016; BEUTELSPACHER; MESCHEDE, 2020; MISSINGHAM, 2021). From this perspective, libraries, due to the participatory characteristic they have in the context of education and society, emerge as fundamental environments in the adoption of practices that provide the amalgamation of sustainability with the management of their activities.

Thus, the next section demonstrates the methodological procedures that guided this research with the purpose of identifying how the theme sustainability is addressed in the scientific literature considering the context of library management.

3 METHODOLOGICAL PROCEDURES

This research was developed as of a qualitative approach, giving researchers an interpretative view of the study, proffered in the formation phases of the bibliographical portfolio and in the evidencing of the collected, analyzed and discussed categories (GONSALVES, 2007). As for the objectives, the research is of exploratory and descriptive nature that aims to seek the understanding of a problem investigated through a portfolio of articles and make it understandable, describing the object of study (GIL, 2007).

The data collection procedure is bibliographic - in scientific articles - carried out through research in three databases (Scopus, Web Of Science and SciELO), allowing researchers to reach amplitude of the area (YIN, 2016). The formation of the bibliographic portfolio concerning the theme proceeded with the aid of the ProKnow-C intervention instrument. Choosing an orderly procedure is critical to initiating a literature review and allows the researcher to demonstrate the paths taken to address a research topic and, consequently, build the necessary knowledge. Defining a structured research process allows the researcher to pay attention to the readings essential to the desired knowledge (AFONSO *et al*., 2012; ENSSLIN *et al*., 2017; TASCA *et al*., 2010). For this reason, aiming to guide the path taken by researchers, supporting the research in a broad universe of information, and allowing the selection of a bibliographic portfolio, the intervention instrument called ProKnow-C is presented.

The ProKnow-C is a structured process that helps the researcher understand and establish the frontiers of knowledge for his theme, create conditions for reflection on what has already been published, highlight gaps, action alternatives for future research and generate subsidies to justify the relevance, uniqueness, and originality of their studies (CHAVES *et al*., 2012; ENSSLIN; ENSSLIN; PACHECO, 2012; TASCA *et al.*, 2010). This instrument is composed of four main steps: 1) Selection of the Bibliographic Portfolio (BP); 2) Bibliometrics or Bibliometric Analysis; 3) Systemic Analysis; and 4) Formulation of Research Questions and Objectives. In the present research, for the construction of the necessary knowledge regarding the verification of "how the scientific literature is approaching the theme sustainability for library management", the first stage of the instrument was carried out.

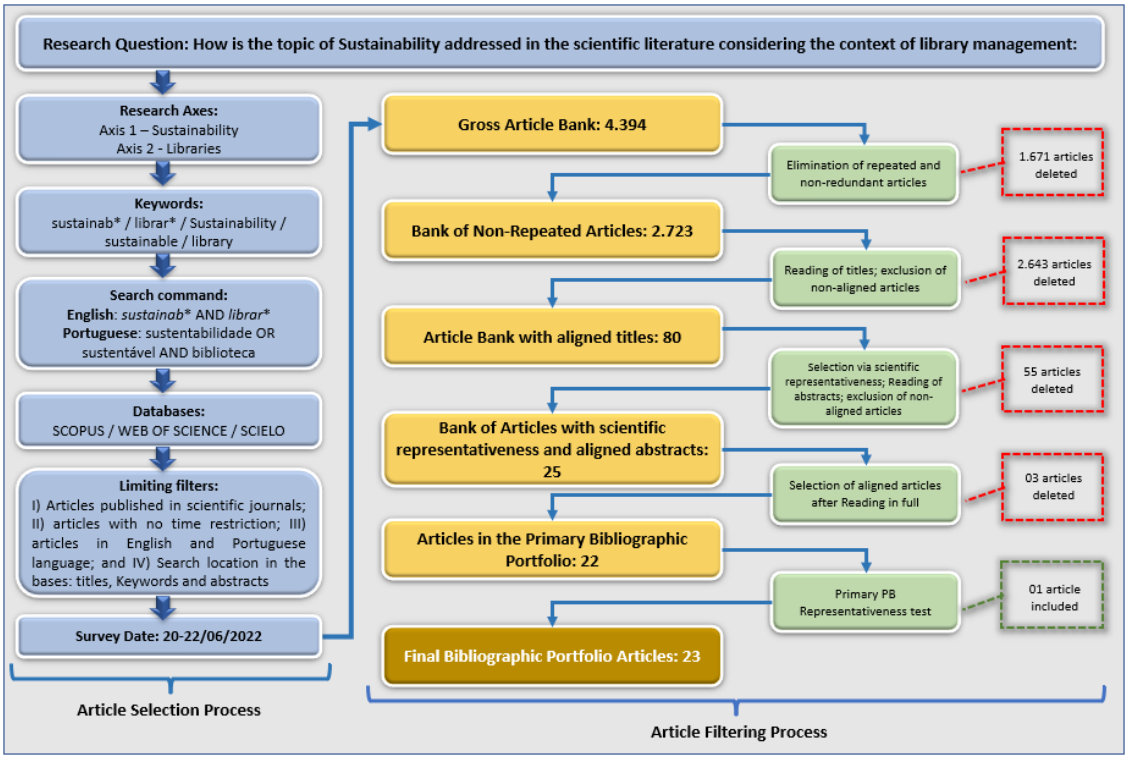
For the stages of presentation, analysis and discussion of the results, the technique of Content Analysis was used, aiming to achieve a methodological rigor from the phases of: 1) Pre-analysis, 2) Exploration of the material - creation of categories and 3) Treatment of results, inferences and interpretations (BARDIN, 2004).

3.1 Selection of the Bibliographic Portfolio

The initial stage of the ProKnow-C methodology, which consists of the selection of the BP, enables researchers to gather a restricted set of relevant scientific articles, with scientific recognition and prominence (LACERDA; ENSSLIN; ENSSLIN, 2011; TASCA *et al*., 2010). The process allows defining the research axes, the keywords of each axis, the combinations used during the search, the databases and the performance of adherence and conformity tests of the choices, in order to present the researcher's

perception regarding the theme (ENSSLIN *et al*., 2015). The final BP selection process can be seen in Figure 3.

Figure 3. Final bibliographic portfolio selection process via ProKnow-C



Source: Prepared by the authors (2022)

The use of the ProKnow-C intervention instrument starts from the research label, in this case: "How is the theme sustainability addressed in the scientific literature considering the context of library management?". Next, the areas of knowledge, or research axes, whose intersection address the theme are defined. Each research axis allows directing the construction of the necessary knowledge about the established context (ENSSLIN *et al*., 2015). Two research axes were determined according to the need perceived by the researcher to seek the most comprehensive knowledge on the subject: Axis 1 - Sustainability; Axis 2 - Libraries.

The next step was to define the keywords, the Boolean expressions, and the formation of the search command to be used in the database search process, which was thus established: "sustainab* AND librar*" (Scopus, Web of Science and SciELO) / "sustentabilidade OR sustentável AND biblioteca" (SciELO). Next, the Databases (DBs) are prioritized according to the following criteria: 1) adherence of the concept to the subject; 2) alignment of the DB with the keywords; 3) setting the desired representativeness; and 4) explaining which DB contains the sample for the established representativeness.

After the alignment and choice of the Scopus, Web of Science, and SciELO bases, the search for articles was performed using the search command with the following limiting filters: I) articles published in scientific journals; II) articles with no time restriction; III) articles published in English and Portuguese; and IV) use of the search command for the locations: titles, keywords, and abstracts of the articles. The search for articles was carried out from **06/20/2022 to 06/22/2022**; and the results were: Scopus Base: **2,623** articles; Web of Science Base: **1,713** articles, SciELO: **58** articles; totaling **4,394** articles.

The article filtering process begins with the raw BP of **4,394** articles, these articles were imported into the Endnote software, which allowed the exclusion of 1,671 repeated and non-redundant publications, leaving **2,723** articles. After this, the titles of the non-repeated articles were read - the inclusion criterion was the presence of keywords related to the theme described in the titles of the articles - **2,643** articles were excluded, leaving 80 articles previously aligned.

With 80 articles being part of the BP under construction, an Excel spreadsheet was prepared to identify the degree of scientific recognition of the publications through the number of citations of each article; this information was collected via the online site Google Scholar on 06/25/2022. The representativeness rate, for cutting the articles with the lowest scientific recognition, was set at 90% - this implies clarifying that of the total number of citations in the BP of 80 articles, 32 articles represent 90% of the citations, with articles having nine citations or more. In absolute numbers, for continuing the formation of the final PB, two portfolios were obtained, called: (i) "Repository K": **32** articles; (ii) "Repository P": **48** articles.

Starting for the analysis of Repository K, from 32 articles, the abstracts were read - the inclusion criterion was empirical and theoretical studies related to the theme, excluding systematic literature reviews - and the result was 19 aligned articles. From these 19 articles, a total of 30 authors were identified, forming a Bank of Authors (BA) to be used in the analysis of the P Repository.

The analysis of the P Repository, of 48 articles, performs the separation of the most recent articles (2020 to 2022) - identified **20** recent articles and **28** not recent. Of the non recent articles, the presence of some author in the BA was verified; none of the 28 articles presented authors in the BA and were eliminated. Of the recent articles, after reading the abstracts - considering the same inclusion criteria previously used - **six** articles were aligned; 14 were discarded.

After the abstract reading process was concluded, the portfolio for reading in full was established at 25 articles. The **25** articles were available, and after the reading in full - eliminating the articles that were not aligned with the others, according to the researchers' perception - the result revealed **22** aligned articles.

The last step in the selection of the final BP is the representativeness test. This phase is intended to verify the existence of aligned articles and with representativeness, contained in the references of the portfolio of articles and that have been omitted (ENSSLIN *et al*., 2015). Counting the references of the 22 articles resulted in 829 total references and 323 references containing only journal articles. The titles of the references that contained only journal articles were read, and the references that were initially aligned with the research topic were separated; resulting in **19** articles.

After again performing the representativeness test, reading the abstracts and the full text, the researchers were interested in including **one** more article, totaling **23** articles that formed the Final Bibliographic Portfolio; Chart 1 presents the results achieved.

Chart 1. Final Bibliographical Portfolio

	Author(s) / Article Title / Journal / Year	N. citations from article
Art.1	JANKOWSKA, M. A.; MARCUM, J. W. / Sustainability challenge for academic libraries: planning for the future / College & Research Libraries / 2010	142
Art.2	EDWARDS, B. W. / Sustainability as a driving force in contemporary library design / Library Trends / 2011	50

Art.3	CHOWDHURY, G. G. / Sustainability of digital libraries: a conceptual model and a research framework / International Journal on Digital Libraries / 2014	43
Art.4	BRODIE, M. / Building the sustainable library at Macquarie University / Australian Academic & Research Libraries / 2012	35
Art.5	ANASI, S. N.; UKANGWA, C. C.; FAGBE, A. / University libraries-bridging digital gaps and accelerating the achievement of sustainable development goals through information and communication technologies / Technology and Sustainable Development / 2018	29
Art.6	BOYDEN, L.; WEINER, J. / Sustainable libraries: teaching environmental responsibility to communities / The Bottom Line / 2000	28
Art.7	LE BER, J. M.; GREGORY, J. M. / Becoming green and sustainable: a Spencer S. Eccles health sciences library case study / Journal of the Medical Library Association / 2004	26
Art.8	CHOWDHURY, G. G. / How to improve the sustainability of digital libraries and information services? / Journal of the Assoc. for Inform. Science and Technology / 2016	24
Art.9	WILSON, L. A. / Creating sustainable futures for academic libraries / Journal of Library Administration / 2012	23
Art.10	BEASLEY, G.; ROSSEEL, T. / Leaning into sustainability at University of Alberta Libraries / Library Management / 2016	15
Art.11	TOWNSEND, A. K. / Environmental sustainability, and libraries: facilitating user awareness / Library Hi Tech News / 2014	14
Art.12	KOSCIEJEW, M. / Public libraries and the UN 2030 Agenda for Sustainable Development / IFLA Journal / 2020	13
Art.13	PIONKE, J. J. / Sustainable library services for all / Library Management / 2016	12
Art.14	STILWELL, C.; HOSKINS, R. / Integrated library management systems: a review of choices made and their sustainability in South Africa / Information Development / 2012	11
Art.15	DIAS, S. M. / Environmental sustainability for public libraries in Portugal: a first approach / Electronic Green Journal / 2017	11
Art.16	BEUTELSPACHER, L.; MESCHEDE, C. / Libraries as promoters of environmental sustainability: collections, tools and events / IFLA Journal / 2020	10
Art.17	MISSINGHAM, R. / A new lens for evaluation: Assessing Academic Libraries using the UN sustainable development goals / Journal of Library Administration / 2021	6
Art.18	SINGH, P.; MISHRA, R. / Environmental sustainability in libraries through green practices/services / Library Philosophy and Practice / 2019	6
Art.19	THORPE, C.; GUNTON, L. / Assessing the United Nation's sustainable development goals in academic libraries / Journal of Librarianship and Information Science / 2021	1
Art.20	SILVA, D. P.; KARPINSKI, C. / Sustainable actions and practices in librarianship: the Univali Library Campus Balneário Camboriú / Perspect. em Ciênc. da Inform. / 2019	1
Art.21	HAMAD, F.; AL-FADEL, M. / Advocacy of the sustainable development goals in Jordanian academic libraries / IFLA Journal / 2021	0
Art.22	SINGH, P.; MISHRA, R. / Environmentally sustainable approaches in academic libraries: a micro-study in Uttar Pradesh / Library Philosophy and Practice / 2021	0
Art.23	SINGH, M. P.; DIXIT, S. / Sustainable strategies towards green libraries: a study of state university libraries of Lucknow, Uttar Pradesh / Library Philosophy and Practice / 2021	0

Source: Prepared by the authors (2022)

With the end of the Bibliographic Portfolio Selection phase, carried out using the ProKnow-C structured instrument, the result obtained was a PB of 23 articles aligned to the theme and with scientific representativeness.

3.2 Content Analysis Steps

Content Analysis is a research technique that is structured in three phases - Pre-analysis; Exploration of the material - creation of categories; Treatment of results, inferences and interpretations - and that the validity of the results of a research result from the internal and systematic coherence between these phases (BARDIN, 2004).

Pre-analysis is the phase of organization in Content Analysis, selecting the materials that will be useful for the research by performing a floating and exhaustive reading of the materials and choosing the most relevant documents for the research objective.

In the sequence, the creation of categories consists in pointing out the marking elements that will allow extracting from the communications the essence of its message, and may be defined a priori or posteriori (BARDIN, 2004). In this research, it was made the categorization a priori, listing four initial categories of characteristic elements to the researched theme and the type of document analyzed (scientific articles), as well as the description of the guiding concept of each category, built according to the epistemological view detected during the research (Figure 4).

Figure 4. Initial categories, guiding concepts

Initial Categories	Guiding Concept
Purpose / Application	Check with what intention, intent, purpose, application, or purpose the researcher(s) developed the research.
Dimensions of sustainability	Sustainability / sustainable development is based on three main dimensions: environmental or ecological, economic, and social.
Main Result	Item that is intended to reveal what was found, that is, it is the most relevant description found and highlighted in the search.
Classification (research approach and strategies)	The research approach refers to the point of view used by the researcher in the analysis of the results, and can be: qualitative, quantitative or quali-quantitative; and as for the research strategy (data collection), the types can be: bibliographic, documentary, case study, field study, etc.

Source: Prepared by the authors (2022)

After the categorization phase, the Content Analysis follows with the aim of constituting and capturing the contents contained in the collected material, bringing results to enable their discussion and interpretation (BARDIN, 2004). Thus, the phase of Treatment of results, inferences and interpretations took place considering the interpretation and worldview of researchers in order to confront the research problem with the results and literature researched.

4 PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

For presentation, analysis and discussion of the results, this section is subdivided into: 4.1 Content Analysis: Pre-analysis; 4.2 Content Analysis: Categorization; and 4.3 Content Analysis: Treatment of results, inferences and interpretations.

4.1 Content Analysis: Pre-analysis

The Pre-analysis phase suggested by Content Analysis aims to make the collected material operational, systematizing the initial ideas through floating reading and choice of documents, which consist in the demarcation of what will be analyzed (BARDIN, 2004). The floating reading of the collected articles was carried out widely, based on the rule of completeness, which allowed researchers to become aware of the texts and highlight the preliminary ideas corresponding to the intentions of the investigation. Then, as a result of the wide floating reading, 23 BP articles were chosen for the delineation of meanings and selection of the corpus for content analysis. The choice of all articles was based on the rules of exhaustiveness - demands that no document should be left out; homogeneity - the selection of documents allows comparison and proximal categorization; and pertinence - stresses that the documents must correlate with the analysis objectives (BARDIN, 2004).

4.2 Content Analysis: Categorization

The categorization process is intended for the analytical description of a synthesis text, expressing the set of meanings present in the units of analysis for each of the categories. The description of the categories, besides enhancing the study, points out the constructive elements that will enable the richness of the interpretations and inferences. Thus, Chart 2 presents the descriptions taken from the articles in the BP according to pre-established categories (see Figure 4).

Chart 2. Description of the categories (units of analysis) of the articles in BP

CATEGORIES	
MAIN RESULT / RESEARCH CLASSIFICATION (APPROACH AND STRATEGIES)	PURPOSE, APPLICATION / DIMENSIONS OF SUSTAINABILITY
It presents the revelation of what was found, that is, it is the most relevant description found and highlighted in the research; verifying the point of view approach and the research strategy (data collection) used in the study.	It presents the intention, intent, purpose, application, or purpose that the researcher(s) developed the research; verifying the application of the dimensions of sustainability: environmental or ecological, economic, and social.
Development of sustainability assessment mechanisms in libraries	
Art. 1 - the development of sustainability indicators in libraries can generate a comprehensive framework, helping to assess the impacts of future operations and projects / Qualitative approach - Literature review.	Art. 1 - Scholarly and information communication in digital and print collections; environmental education of librarians and the public; sustainable architectural designs in library construction; measuring progress toward sustainability / Environmental, economic, and social dimensions.
Art. 3 - the proposed models can be used as a research framework to study various sustainability factors in the context of different library types / Qualitative approach - Literature and document review.	Art. 3 - Model created and used to demonstrate the various processes of creation, access, and use of information; and other factors responsible for sustainability / Environmental, economic, and social dimensions.
Art. 9 - how libraries can generate flexibility, promote collaboration, align activities, reduce costs, and encourage innovation within the framework of a sustainable	Art. 9 - Creation of spaces that offer consultations, workshops, and collaborative environments for studies, projects, presentations, and research that productively respond to environmental issues / Environmental,

academic plan / Qualitative approach - Case study.	economic, and social dimensions.
Art. 12 - the constructed conceptual framework provides a template for further analysis on the active values and functions of the library with respect to Agenda 2030 / Qualitative approach - Literature review.	Art. 12 - Library practices and contributions to sustainable development in the context of the UN Agenda 2030 / Environmental, economic, and social dimensions.
Art. 17 - the Sustainable Development Goals (SDGs) provide a multidimensional assessment and can be used as reports in the absence of specific measures in libraries / Qualitative approach - Case study.	Art. 17 - Evaluation of libraries using the SDGs / Environmental, economic, and social dimensions.
Art. 19 - the SDGs can be used as an evaluation framework to provide evidence by which libraries demonstrate their positive impact for sustainability goals / Qualitative approach - Case study.	Art. 19 - Presence of the SDGs in the usual tasks, strategic activities and operational objectives / the involvement of employees in identifying individual contribution and goals / actions monitored and communicated through formal and informal means to a variety of audiences / Environmental, economic and social dimensions.
Art. 21 - conducting ongoing training of staff on the important roles and responsibilities of libraries with regard to achieving and fulfilling the SDGs / Quantitative approach - Case study.	Art. 21 - Role of libraries in meeting the SDGs / SDG implementation practices / requirements for effective use of the SDGs / obstacles / staff evaluations in meeting the SDGs / Environmental, economic, and social dimensions.
Green building: architecture, design, energy and water consumption, indoor environment, waste reduction and recycling, accessibility, among others	
Art. 2 - Libraries are adjusting to new environmental and cultural demands by offering design based on energy efficiency / Qualitative approach - Case study.	Art. 2 - Sustainable design project quality: energy use, indoor air quality, water conservation, biodiversity (finishing materials), noise and acoustic zoning, impact of materials used, environmental issues in space and use / Environmental and economic dimensions.
Art. 4 - the construction of the new library considered various aspects of sustainability in its design / Qualitative approach - case study.	Art. 4 - Sustainable building design: management of energy, water, thermal comfort, choice of materials used, publicizing sustainability initiatives / Building management / Sustainable collections / Sustainable organization of the library and services offered / Environmental and economic dimensions.
Art. 6 - for libraries, the use of natural light, available energy and ventilation are methods that affect efficiency, and the implementation of lighting and cooling strategies are important in architectural designs / Qualitative approach - Case study.	Art. 6 - Sustainable building project and design: measurement of materials used in construction and energy consumption / Environmental and economic dimensions.
Art. 7 - library staff support made a significant impact in reducing waste, recycling discarded materials, and decreasing the impact on the environment / Qualitative approach - Case study.	Art. 7 - Library greening program: action for recycling materials / Environmental and economic dimensions.
Art. 8 - the environmental and energy costs of digital libraries and information services can be reduced in a variety of ways by developing appropriate policies / Qualitative approach - Desk review.	Art. 8 - Measurement of the energy and environmental costs generated by the servers (hardware) used in digital libraries / Environmental and economic dimensions.
Art. 10 - the library construction project is already resulting in significant savings in staff time and space / Qualitative approach - Case study.	Art. 10 - Use of Lean design in the construction of a new library (1) and a Pilot of specialized library services (2) / Environmental, economic, and social dimensions.
Art. 11 - most libraries have sustainable building certification and are actively involved in promoting environmental sustainability / Qualitative approach - Case	Art. 11 - Initiatives to promote environmental sustainability for users; increased awareness; LEED certification methods and the green building features of

study	libraries / Environmental and economic dimensions.
Art. 13 - there is a need to create greater accessibility in libraries through the lens of sustainability / Qualitative approach - Literature review.	Art. 13 - Creating accessibility in a sustainable way for users - promoting the use of buildings, spaces and services and improved community outreach / Environmental, economic and social dimensions.
Art. 22 - libraries have implemented some environmentally sustainable (green) practices in terms of building design features, water conservation, energy efficiency/conservation, etc. / Quantitative approach - Case study.	Art. 22 - Sustainable practices in construction projects, water conservation, energy efficiency/conservation, waste management, development of sustainable collection and use of sustainable technology / Environmental and economic dimensions.
Information and Communication Technologies (ICT) in helping and accelerating the achievement of sustainable development	
Art. 5 - libraries are lagging in the use of ICT in service delivery and in accelerating the achievement of the SDGs / Quantitative approach - case study.	Art. 5 - ICT use in library services and in updating the Sustainable Development Goals (SDGs) / Environmental, economic, and social dimensions.
Art. 14 - a reliable ICT infrastructure is a prerequisite for good information management practices and ensures better planning for collections, achieving institutional and development goals / Qualitative approach - Case study.	Art. 14 - Use of management systems as a basis for good management practices and sustainable development / Environmental, economic, and social dimensions.
Art. 18 - libraries can create a greener vision by running green document printing operations, being responsible for daily paper consumption while helping to save the planet / Qualitative approach - Literature review	Art. 18 - Strategies and practices to reduce the impact of printing machines / Provides information, practices and suggestions to obtain eco-friendly printing and copying / Environmental and economic dimensions.
Art. 23 - all library sections are computerized, but have difficulties in implementing the green library, however, there are efforts to develop sustainability / Quantitative approach - Case study.	Art. 23 - Building (Lighting and Energy Sources, Ventilation, Temperature, Acoustics); Collection and holdings; User awareness; Cleaning and use of plastics; Level of computerization of the sections; Challenges and Strategies for promoting a green library / Environmental and economic dimension.
Sustainable practices applied simultaneously in libraries	
Art. 15 - libraries recognize the importance of the theme and establish a link between management, marketing, the image of the organization and the creation of values that promote and monitor development and sustainability / Qualitative approach - Case study.	Art. 15 - Environmental policies; Financial management; Consumer management; Marketing; Recognition of the importance of the subject / Environmental, economic, and social dimensions.
Art. 16 - libraries are on the path to further contribute to building a sustainable future, as accessible spaces, they have the potential to raise awareness about the topic, disseminate information, raise public awareness, and provide tools to promote sustainability / Qualitative approach - Case study.	Art. 16 - General awareness-raising activities for the community; supply of books, equipment, and tools; organization of events; recycling depots and workflows / Environmental and economic dimensions
Art. 20 - There was an indication that there is a need to better understand what sustainability is as an integrated concept of economic and ecological practices - the library analyzed is an example of a sustainable library as it meets the basic principles of sustainability / Qualitative approach - Case study.	Art. 20 - Construction of the library with green features (façade, lighting, water usage, air-conditioning and natural ventilation systems, etc. / Staff and user awareness project / Sustainable book reading project; o Bookcrossing / Environmental, economic, and social dimensions.

Source: Prepared by the authors (2022)

With the categories listed and described this phase of exploration of the materials was of utmost importance, allowing the identification of the units of context in

the documents and the making of inferences and interpretations of the contents, as shown in the next section.

4.3 Content Analysis: Treatment of results, inferences, and interpretations

This analysis starts by highlighting the research approaches and strategies used to address the theme sustainability considering the context of library management. The results indicated qualitative studies (18), quantitative (four) and quali-quantitative (one); carried out with the data collection procedure of the case study type (17); literature and document review (six); observed in Figure 5.

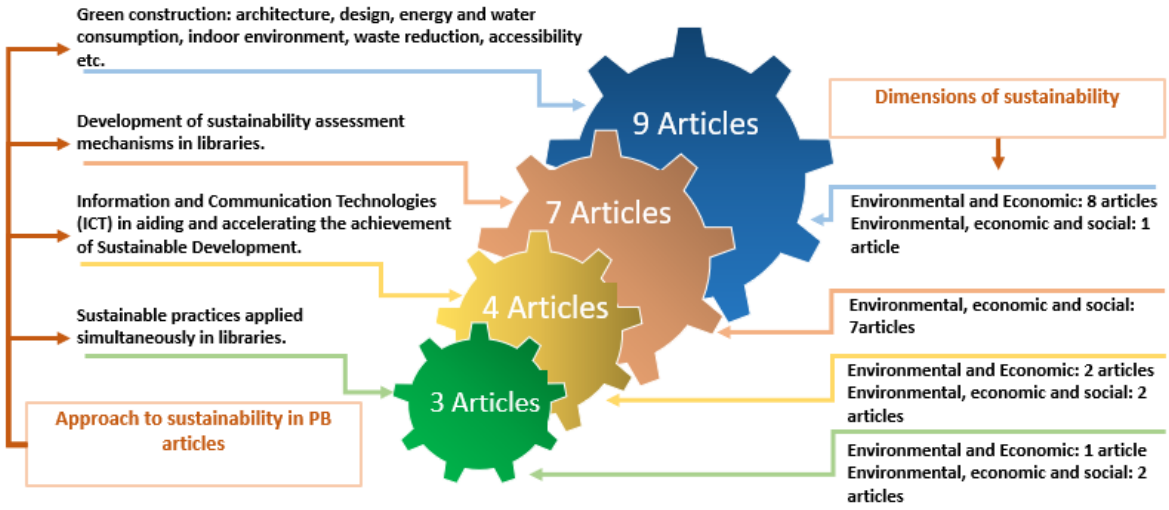
Figure 5. Study approach / Research strategies

Source: Prepared by the authors (2022)

It is noted that 74% (17) of the research used the case study and 78% (18) used the qualitative approach. The case study is an empirical investigation that investigates a contemporary phenomenon within its real-life context (YIN, 2016). Research with a qualitative approach is concerned with understanding the phenomenon by considering the meaning that others give to their practices (GONSALVES, 2007). This result confirms that the concept of sustainability is being put into practice by libraries in ways that generate new learning and understanding of the topic. The application of sustainability in libraries can serve as a starting point for future research and development with a holistic vision, allowing to investigate, define and propose a set of services to be offered broadly to the community (BEASLEY; ROSSEEL, 2016; BEUTELSPACHER; MESCHEDE, 2020; KOSCIEJEW, 2020; LE BER; GREGORY, 2004; TOWNSEND, 2014).

Sustainability had examples of its purpose, application in libraries, absorbing 39.5% (nine) of the studies with the theme of "Green Construction"; 30% (seven) involving "Evaluation mechanisms"; 17.5% (four) of the theme Information and Communication Technologies (ICT); and 13% (three) referring to "Sustainable practices applied simultaneously" (Figure 6).

Figure 6. Contents of the sustainability theme in the context of library management



Source: Prepared by the authors (2022)

It is observed that the sustainability approach had its predominance with the theme "Green Building in Libraries" - highlighting, in 89% (eight articles) of this theme, only the environmental and economic dimensions of sustainability. Green buildings have the goal of reducing dependence on non-renewable resources, promoting waste management, improving the use of space (creating accessibility), among others (BEASLEY; ROSSEEL, 2016; BOYDEN; WEINER, 2000; BRODIE, 2012; EDWARDS, 2011; SINGH; MISHRA, 2021).

Green building projects are not only intrinsically valuable but serve as excellent vehicles for launching a broader conversation about environmental issues, promoting discussions on this topic (PIONKE, 2016; TOWNSEND, 2014). From the results achieved by the studies of the theme - Green Building in Libraries - it is legitimized that through the demonstration to users of feasible examples of environmental preservation and resource saving, reflected through the buildings and internal facilities, it is possible for libraries to expand their awareness activities in the rational use of natural resources.

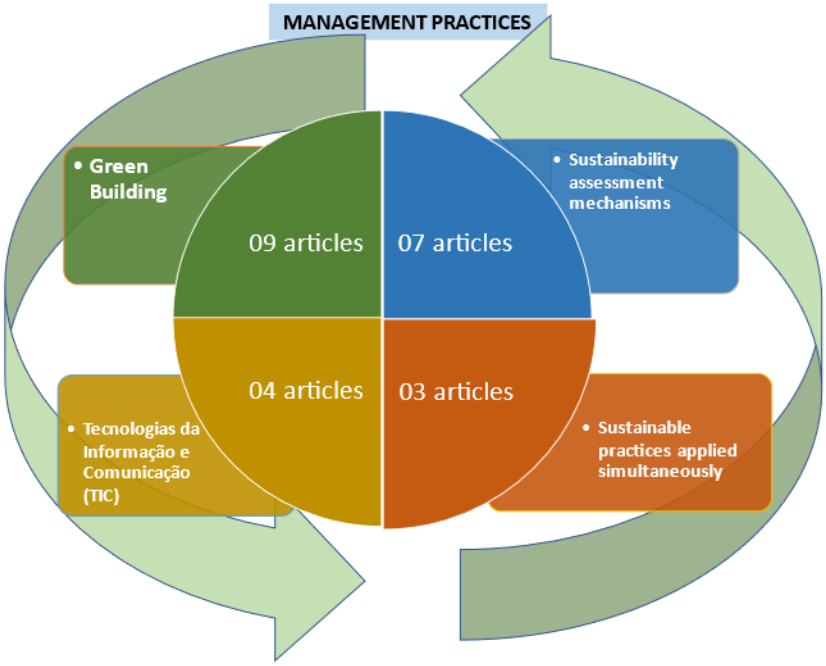
The concern with the environment aimed at saving resources through sustainable buildings is of paramount importance, as highlighted in the articles of the BP. However, the practical examples highlighted in the results of the themes "Development of assessment mechanisms", "Information and Communication Technologies (ICT)" and "Sustainable practices applied simultaneously" - covering the environmental, economic and social dimensions of sustainability in 85% (11) of the articles - point to a perspective of integration of the sustainability concept with an increasing number of activities performed by libraries, as well as the insertion of sustainability assessment mechanisms, ICT use in the generation of service improvements and creation of new opportunities for future actions.

The development of sustainability indicators aims to discuss the multidimensional issues in libraries and identify the needs to design an integrated framework of sustainable strategies (CHOWDHURY, 2014; HAMAD; AL-FADEL, 2021; JANKOWSKA; MARCUM, 2010; MISSINGHAM, 2021). In turn, the use of a reliable ICT framework in library services is a prerequisite for good management practices and assists in achieving institutional goals and broader development objectives (ANASI; UKANGWA; FAGBE, 2018; SINGH; DIXIT, 2021; SINGH; MISHRA, 2019; STILWELL; HOSKINS, 2012). As such, libraries recognize the importance of the topic and that there is a need to better

understand what sustainability is as an integrated concept, however, they are on the path to further contribute to building a sustainable future (BEUTELSPACHER; MESCHEDE, 2020; DIAS, 2017; SILVA; KARPINSKI, 2019).

Nevertheless, despite the fact that most articles in the PB, 20 articles (87%), present the use of the concept of sustainability and its practical application in punctual objectives (Figure 7), it does not imply to state that the researchers' perceptions regarding management practices are limited.

Figure 7. Management practices identified in PB articles



Source: Prepared by the authors (2022).

A management system is something complex, since it involves a set of functions, techniques, and administrative tools, making it difficult to encompass its entirety (DZIEKANIAK, 2009). Moreover, good practices in the library world are the essence of effective management (DIAS, 2017). Green libraries have simultaneously become a set of attitudes and behaviors, it is a multifaceted concept with several separate components that together aim at the appropriate sustainable growth as a consequence of its management (BEUTELSPACHER; MESCHEDE, 2020; DIAS, 2017; SILVA; KARPINSKI, 2019).

Finally, regarding the objective of this research to analyze the contents of the sustainability theme considering the context of library management, it is inferred that the concept of sustainability is being incorporated into the management routines of libraries in order to build knowledge of the theme. This construction of knowledge is reflected through sustainable examples in the buildings, internal facilities and specific initiatives that warn of the importance of integrating the concept of sustainability with an increasing number of activities developed and that, as a result, may expand the functions and responsibilities of libraries in relation to sustainable management.

5 FINAL CONSIDERATIONS

Sustainability has been increasingly highlighted in the scientific literature, a fact that results from the incorporation of its principles in the management of business organizations, educational institutions, and people. For libraries, as they have an important role in the teaching and learning process of Educational Institutions and, consequently, of people, issues involving the incorporation of their management activities to the premises of sustainability have become indispensable. Thus, the present research aimed to analyze, from a fragment of the scientific literature, the contents of the sustainability theme in the context of library management.

The findings of the study demonstrated that: 1°) the portfolio of articles aligned to the theme was represented by 23 documents; 2°) the concept of sustainability considering the context of library management, was addressed in four main themes: (i) Green building in libraries; (ii) Use of Information and Communication Technologies (ICT); (iii) Mechanisms for sustainability assessment; and (iv) Sustainable practices applied simultaneously; 3°) the construction of knowledge about sustainability and its usability in libraries is being generated from practical actions; 4°) it was found that feasible initiatives, as in sustainable buildings and internal facilities, were shown to be a possible path of expansion of user awareness activities regarding the preservation of the environment; 5°) it was pointed out that the perspective is that the concept of sustainability is integrated to an increasing number of activities carried out in libraries and that, together with a periodic assessment and the aid of ICTs, may generate improvements and create opportunities for future actions; and 6°) library management involves a complex set of functions, techniques, instruments and that, for these reasons, isolated initiatives already configure good management practices.

To librarians, managers, and researchers in the field of librarianship it is important to clarify that this study categorizes theoretical and practical initiatives of the concept of sustainability applied to library management. Its contribution is based on its use as a source of information, allowing managers and librarians to absorb issues that are relevant in their routines, choosing and executing actions that are more consistent with their context. And for the researchers, this conceptual synthesis shows that the relationship of the sustainability theme with library management is still under construction, the study demonstrates that there are gaps to be explored, especially regarding the incorporation of the sustainability concept in library management, encompassing all the activities developed.

A limitation of this research is the fact that the interpretation and execution of the content collection and analysis phases considered the researchers' subjectivity and world view on the theme. For this reason, other researchers, when replicating the same method adopted, may obtain results with different characteristics, but which will add to the knowledge of the theme already built in this study. Finally, realizing the need to expand the view of librarians and library users on the subject of sustainability, studies that consider the education and training of these actors are necessary for future research.

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