

P / REFERENCES OF DESIGN

DESIGN AND PROJECT LEARNING: A SYSTEMATIC LITERATURE REVIEW AND DISCUSSION ABOUT THE FUTURE OF THE FIELD.

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ABSTRACT | This article stems from the inception of a doctoral study, wherein the research aims to analyze students' experiences in learning design within undergraduate Design courses. Motivated by global and design-related shifts and considering the challenge of teaching design in the current context of social and technological changes, the authors have conducted a systematic literature review to investigate the current state of knowledge in the field of design education. To this end, the research began by defining the research question, followed by the development of search strategies and, subsequently, the delineation of parameters for data collection across three different databases. Furthermore, the article presents the processes of information gathering, the outcomes derived from the applied filters, and the selected documents that best align with the research theme. Through the analyses conducted, it is understood that for the student's learning experience in design to be memorable and for design schools to produce professionals equipped for the challenges of contemporary society, it is imperative to contemplate new teaching models, skills to be acquired, and to explore future perspectives in design culture.

1. Introduction and Contextualization

One of the most crucial steps in academic research planning, according to Gil (2019), is constituted by literature review, which can be defined as a report on what has been published concerning the topic being researched to inform the reader about theoretical contributions and results of other studies conducted in the addressed area.

Lakatos and Marconi (2003) and Gil (2002) also address the importance of literature review as a fundamental step in building scientific knowledge, emphasizing the need for a systematic and rigorous approach in the analysis and interpretation of bibliographic sources.

Within the context of the Systematic Literature Review to be presented in this study, its execution period spans from November 2023 to January 2024, intending to investigate relevant themes for the research from various sources.

For this development, the research began by defining the research question, followed by the elaboration of search strategies, including a preliminary study to validate the search terms, as well as parameters to define sources and initiate data collection from databases gathering documents in the scientific field (Elsevier, 2024).

2. Development of Systematic Literature Review

The proposed research topic relates to Design, Emotion, and User Experience in educational and learning contexts. Sequentially, the PICO approach was utilized, which, according to Higgins and Green (2011), is a structured method responsible for organizing research questions into four main components:

- Population: Undergraduate students in Design courses;
- Intervention: Techniques, experience models, learning methods that prioritize experiences;
- Comparison: Traditional design teaching methods, models that do not emphasize experiences, teaching experience versus learning experiences;
- Outcome: Relationship of teaching models or experience reports discussing students' experience in learning design or creative activities in undergraduate design courses.

2.1 Search Strategies

For this Review, a preliminary search was initiated in English on the Google Scholar website (2024) to define and validate search terms and their combinations, which were those represented in Figure 1.

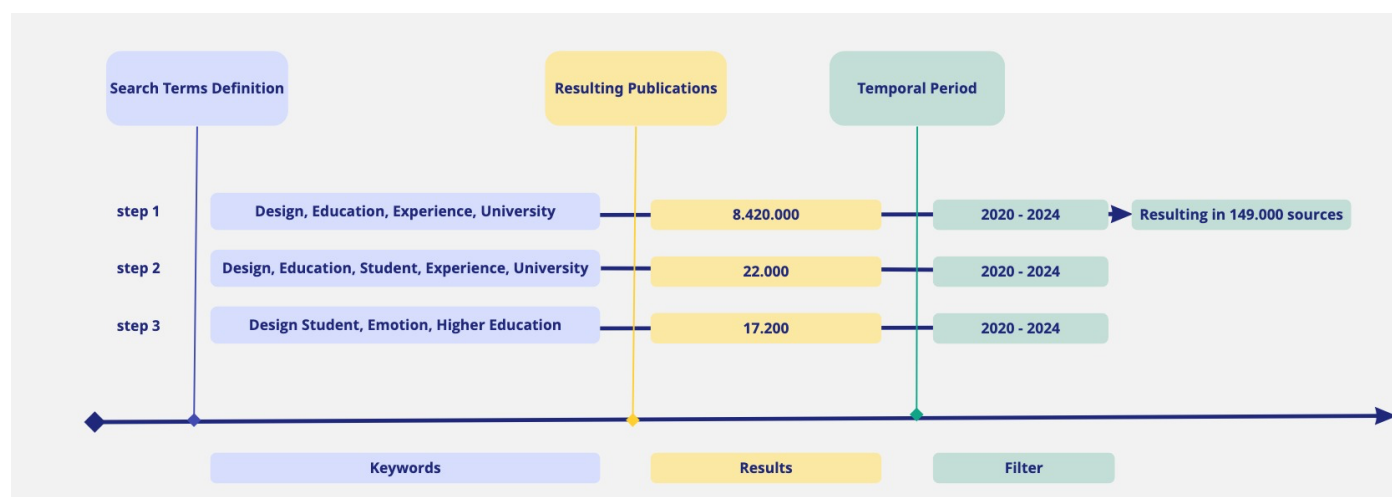


Figure 1. Representation of the three stages that made up the preliminary research.

Many of the results relate to the role of the teacher in these processes, discussing more teaching rather than learning, necessitating the use of a search term like "learning." Hence, a new search was defined with the descriptors listed below.

- "higher education," "learning," "design," "experience" - resulting in 49,200 sources. Generalization was observed due to the broad meaning of the term design, which yields results from various fields, including healthcare. In this regard, efforts were made to validate a new combination of terms.
- "higher education" and "experience learning design" - yielding a result of 34 articles, with topics more closely related to the area of interest of this research.

2.2 Search Terms

The construction of the search string was, therefore, based on the mentioned contextualization and validation, defining the following terms and their synonyms (Table 1).

Table 1. Defining search strings.

Descriptors	Synonyms
"higher education"	Education
	Educação
	High Education
	Universidade
	University
"experience learning design"	Aprendizagem de Projeto
	Experiência
	Experiência do estudante
	Learning design

Although the search terms were defined in English, to ensure a broader search considering the number of academic productions in this language, whether original or translated, synonyms in both English and Portuguese were also chosen.

These terms were used in Parsifal, a website that organizes information from Systematic Literature Reviews. According to its website, it assists in the identification, selection, and evaluation of systematic reviews, extracting, structuring, and providing information, as well as its methodological characteristics objectively (PARSIFAL, 2024).

For this systematic literature review, three databases were used, namely Portal de Periódicos Capes¹, Scopus², and Science Direct³.

2.3 Inclusion and Exclusion Criteria

It was also necessary to define criteria for the inclusion and exclusion of publications to ensure that searches were in line with the research needs and that the collected sources met the expected quality for subsequent analysis. In this sense, the requirements are characterized as follows:

- Articles, book chapters, and case studies published from 2020 to the present moment (2024);
- Articles, book chapters, and case studies in Portuguese or English and related to the areas encompassed by this research: Design, Experience, Education.

On the other hand, publications will be excluded from further analysis if they:

- Are duplicates;
- Articles lacking abstract and/or keywords;
- Articles with unavailability of the work in its entirety;
- Articles showing no signs of relevance to the focus of this research identifiable from the title and keywords.

2.4 Identification, Selection, Eligibility, and Inclusion

The PRISMA protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is used as a reference, defined by Moher et al. (2009) as a set of guidelines aimed at improving transparency and quality in the development and presentation of systematic reviews, providing a detailed roadmap for reporting the essential elements of a systematic review, helping authors ensure the integrity and clarity of the research process.

Thus, following PRISMA recommendations, the results obtained from scientific databases are subjected to a flow of procedures segmented into four classifications, as described in the table below (Table 2), which relates stages and procedures:

¹ www.periodicos.capes.gov.br

² www.scopus.com

³ www.sciencedirect.com

Table 2. Indexed electronic databases.

Phases	Procedures
Identification	Gathering results from each database
Selection	Exclusion of duplicate articles, outside the period of interest and that do not meet the inclusion and exclusion requirements based on the analysis of keywords, title and abstract
Assessment	Reading the introduction and conclusion of the selected articles, also considering the exclusion criteria
Synthesis and inclusion	Reading, in full, the articles selected based on the proposed quality criteria

Based on the defined search strategy and specified criteria, the results from the three listed databases provided a total of 3728 records for initial selection, comprising 11 records from the Portal de Periódicos Capes, 189 from Science Direct, and 3528 from Scopus. The Parsifal software was utilized for managing these records.

Through this review, 166 studies were accepted, necessitating a further review of their titles and abstracts, subsequently resulting in 60 records meeting the criteria established for the evaluation stage.

At this stage, these 60 documents underwent a review of their titles and abstracts, resulting in a total of 16 records for the fourth and final stage, Synthesis and Inclusion.

2.5 Synthesis and Inclusion of Results

From the 16 selected studies meeting the requirements presented for this Systematic Literature Review, they are classified into three different categories: studies closely related to the research area, studies related to the area but with a more generalist or less in-depth perspective on the research themes, and some texts that stimulate further investigation into what has been presented (especially concerning Participatory Design and Design Thinking). Additionally, articles classified as having a stronger connection with the criteria of the Systematic Literature Review provide more contributions to discussing the future of design education, not so much through students' experiences but towards rethinking some teaching criteria in the field.

3. Design Education: Discussion About Results and Future of the Field

The synthesis of the mentioned studies establishes significant connections, particularly in the category emphasizing core aspects of this research, enhancing understanding of undergraduate design learning experiences. Notably, Wakelam et al. (2020) highlight predictive analysis in small classes as foundational for effective teaching strategies.

Furthermore, Trimmer (2020) advocates for innovative curriculum development integrating design thinking and student-centered research, and Kaviani (2020) emphasizes curriculum design's meaningfulness and motivation through a phenomenological approach. Bigos & Michalik (2020) stress emotional competencies in entrepreneurial intentions, which are vital for socio-emotional

skill development in design students. Jivet et al.'s (2020) study promotes autonomy for effective learning, while Crowther & Briant's (2021) longitudinal research delves into factors affecting long-term student performance. These studies highlight the importance of multidisciplinary approaches in designing educational programs.

Wasson & Kirschner (2020) introduce European learning design approaches, while Blumenstein (2020) explores the synergy between learning analysis and design. Heggart & Dickson-Deane (2022) examine essential skills for learning designers, and Henriksen et al. (2021) explore creativity and risk-taking in design education, collectively deepening understanding of undergraduate design learning experiences. Bishop et al.'s (2021) comprehensive resource addresses instructional design topics beneficial for educators and researchers aiming to enhance educational practice.

Engelbertink et al. (2020) highlight the necessity of active collaboration between students and educators in design education, stressing the importance of involving students in the design process. Similarly, Tsai et al. (2023) investigate the impact of combining design thinking with constructivist learning on motivation and problem-solving abilities. These studies underscore the significance of student-centered approaches for stimulating learning environments. Integrating methodologies like design thinking and constructivism empowers educators to create dynamic learning environments that nurture practical skills and creativity among design students.

In the context of understanding the current state of design education, the authors discussed here delve into its concept, propose curricular changes, and envision the future of the field. Buchanan (2020), as interviewed by Frascara (2020), argues that education transcends mere skill training. It entails intellectual preparation for lifelong learning, fostering mental capacities to tackle new situations with ingenuity, imagination, and creativity.

Buchanan apud Frascara (2020) identifies the four dimensions of creativity as essential elements in design education: inventiveness, receptiveness to discovering new facts, innovativeness, and openness to intuition in perceiving principles and values that provide organization, coherence, and interdependencies in surrounding systems. Another seminal study in this discourse is Findeli's (2001), which reconceptualizes design education through theoretical, methodological, and ethical discussions, proposing an archetypal curriculum model comprising art, science, and technology components.

It is preliminarily concluded that doctoral research in this area necessitates examining various university models to understand their structures concerning student learning needs and contextual demands. These aspects also warrant further exploration to establish principles, guidelines, tools, and methods for their study, fostering the evolution of universities and undergraduates in a rapidly changing field. Furthermore, this discourse on the student experience in learning design enriches the understanding of design education's pivotal role in nurturing creative and innovative professionals. Reflecting on design practice and applying design principles in contemporary and future contexts are integral components of the educational process, equipping students to address the multifaceted challenges of the current market and society.

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