

Pedagogical architecture and higher education in distance learning: the State of the Art of research in Brazil¹

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Abstract

This article aims to present a systematized analysis of Brazilian academic production on Pedagogical Architecture in higher education in the distance learning modality, covering the period from 2014 to 2024. The research question guiding this study is: “how has the concept of Pedagogical Architecture been approached, articulated, and applied in practices and studies within higher education in the distance learning context?”. The data collection was conducted using the *State of the Art* methodology, based on the databases of the Coordination for the Improvement of Higher Education Personnel. The analysis reveals that Pedagogical Architecture in higher education within this modality is an expanding field, characterized by methodological innovations and institutional challenges. The results highlight the need for policies and formative practices that integrate technology, critical thinking, and affectivity in Distance Education in the contemporary context.

Keywords: Pedagogical architecture; distance education; higher education.

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Arquitetura pedagógica e o Ensino Superior na modalidade a distância: o Estado da Arte das pesquisas no Brasil

Resumo

Este artigo tem como objetivo apresentar uma análise sistematizada da produção acadêmica brasileira sobre Arquitetura Pedagógica no ensino superior na modalidade a distância, no período de 2014 a 2024. Tem como questão de pesquisa: “como o conceito de Arquitetura Pedagógica tem sido abordado, articulado e aplicado nas práticas e estudos no ensino superior na modalidade a distância?”. O levantamento desta pesquisa foi conduzido dentro da modalidade Estado da Arte, realizado nas bases da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior. A análise evidencia que a Arquitetura Pedagógica no ensino superior nesta modalidade é um campo em expansão, marcado por inovações metodológicas e desafios institucionais. Os resultados reforçam a necessidade de políticas e práticas formativas que articulem tecnologia, criticidade e afetividade na Educação a Distância no cenário contemporâneo

Palavras-chave: Arquitetura pedagógica; educação a distância; ensino superior.



Arquitectura pedagógica y la educación superior en la modalidad a distancia: el Estado del Arte de las investigaciones en Brasil

Resumen

Este artículo tiene como objetivo presentar un análisis sistematizado de la producción académica brasileña sobre Arquitectura Pedagógica en la educación superior en la modalidad a distancia, en el período de 2014 a 2024. Tiene como pregunta de investigación: cómo se ha abordado, articulado y aplicado el concepto de Arquitectura Pedagógica en las prácticas y estudios en la educación superior en la modalidad a distancia? El levantamiento de esta investigación fue realizado bajo la modalidad de Estado del Arte, en las bases de la Coordinación de Perfeccionamiento de Personal de Nivel Superior. El análisis evidencia que la Arquitectura Pedagógica en la educación superior en esta modalidad es un campo en expansión, marcado por innovaciones metodológicas y desafíos institucionales. Los resultados refuerzan la necesidad de políticas y prácticas formativas que articulen tecnología, criticidad y afectividad en la Educación a Distancia en el escenario contemporáneo.

Palabras clave: Arquitectura pedagógica; educación a distancia; educación superior.



Introduction

The technological advances of recent decades have significantly transformed access to information, communication, and social interactions, shaping new forms of culture and modes of action, especially in the educational field. In this scenario, Distance Education (DE) has become consolidated not through an abrupt transformation, but through a gradual accumulation of practical changes that flexibilize time and space, expand scale, and introduce new forms of monitoring, thereby contributing to the expansion of access to higher education, particularly in Brazil.

However, this expansion imposes new challenges for educators and institutions, which must adapt in order to overcome traditional practices and contemporary demands. Among the main needs is the development of a Pedagogical Architecture (PA) for the DE modality, incorporating innovative paradigms capable of responding to the emerging profile of students and teachers.

Several authors, such as Behar and Schneider (2016), Silva, L. (2021), Sales, Albuquerque, and Santos (2022), and Gava and Haviaras (2023), have contributed to the debate on the concept of Pedagogical Architecture, presenting distinct perspectives that enrich the understanding of the topic. The variety of these conceptions points to the complexity of the challenge and to the need for systematic and in-depth studies.

Considering this problem, the present article aims to present a systematized analysis of Brazilian academic production on Pedagogical Architecture in higher education within the distance learning modality, with a temporal delimitation covering the period from 2014 to 2024. The research is guided by the following central question: “How has the concept of Pedagogical Architecture been approached, articulated, and applied in practices and studies developed in distance higher education?”



This study seeks to fill a central theoretical-methodological gap in the field of Pedagogical Architecture for DE teaching: the absence of a systematic and updated mapping (post-2014) of national production in higher education that integrates the analysis of trends, key concepts, and recurrent issues. Among these challenges are insufficient teacher training, the lack of systematization and consistent evaluation of Pedagogical Architectures in real contexts, as well as the persistence of reproductive practices that limit students' autonomy and collaboration.

Despite the conceptual advances observed in isolated productions – especially regarding the integration between organizational, methodological, technological, and content dimensions – this gap still persists in the field, evidencing the need for more systematic and articulated studies.

In this context, the present State of the Art contributes to filling this gap by mapping 13 productions selected from the databases of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, analyzing their trends, conceptual contributions, and limitations. The results reveal emerging movements, such as the centrality of affectivity in digital environments, mobile learning, and the use of active methodologies, pointing to new frontiers for research. Such findings reinforce the need for continuous investment in research, innovation, and policies that consolidate the field and expand the social relevance of Distance Education.

This discussion is part of a doctoral research project under development in the Graduate Program in Education and Contemporaneity (PPGEduC) at Universidade do Estado da Bahia, which investigates the essential parameters for the development of a guiding framework for the Pedagogical Architecture of undergraduate distance learning programs at the institution. The study was approved by the Research Ethics Committee (CEP/UNEB) on May 19, 2025, under opinion no. 7.576.617.

The survey for this research was conducted within the State of the Art (SA) modality, a type of investigation with its own specific and well-defined



scope, taking as references the studies by Teixeira (2023) and Jacomini et al. (2023). Such an approach is grounded in rigorous theoretical-methodological parameters, with the purpose of mapping the main approaches, trends, and gaps in the research carried out in the country.

As characterized by Teixeira (2023, p. 6), State of the Art studies

[...] are works dedicated to identifying, mapping, describing, and analyzing – across multiple dimensions and aspects, according to the interests of the investigation – the set of research developed within a given field of knowledge. Therefore, they are studies devoted to investigating the evolutionary dynamics of research within an area, in a given region (country, continent, etc.), according to the temporal delimitation defined for the survey of works belonging to the scope of interest.

Within this perspective, based on the careful selection of theses, dissertations (TD), and scientific articles indexed in national databases, the study sought to outline the panorama of knowledge already produced and to understand how the concepts of PA have been mobilized in the construction of innovative and contextualized pedagogical practices within Distance Education in Brazilian higher education.

For this research, we adopted the term “State of the Art” to refer to the set of studies analyzed, regardless of whether they self-identify as “State of the Art” or “State of Knowledge,” since this is a more recent understanding adopted by specialized literature (Jacomini et al., 2023, p. 7-8).

Table 1 presents the methodological design adopted for the development of the State of the Art on the theme of Pedagogical Architecture in the context of higher education within the distance learning modality, whose procedures will be detailed in the following subsections.



Table 1 – Methodological design of the research for the development of the State of the Art

ITEM	DESCRIPTION
Databases	- CAPES Journal Portal (PP) - CAPES Theses and Dissertations Catalog (CTD)
Temporal delimitation	2014–2024
Descriptors	“Pedagogical architecture”; “Higher education”; “Distance education.” Crossing the descriptors: distance education, distance teaching, DE, pedagogical architecture, pedagogical design, higher education, tertiary education, and university.
Boolean operator	“AND” e “OR”
Inclusion criteria	- Research exclusively in the field of Distance Education within the context of higher education. - Studies in which the descriptors appear in the titles, abstracts, or keywords. - National academic production (spatial delimitation). - Works addressing the theme of Pedagogical Architecture in higher education within the distance learning modality.
Exclusion criteria	- Duplicate works in the consulted databases. - Research not inserted within the context of Distance Education. - Studies that do not address higher education within the distance learning modality. - Productions presenting a superficial approach to the theme, without analytical development pertinent to the object of study.
Search fields	Title, abstract, and keywords
Types of works	Theses, dissertations, and scientific articles

Source: Prepared by the authors (2026), based on Santiago (2023, p. 97).

It is noteworthy that the methodological design adopted in this research is in line with Teixeira (2023, p. 9-10), who systematizes a set of stages to be followed, namely:

- (i) define the scope of the examined production, that is, the area or subarea that will constitute the focus of the survey;
- (ii) delimit the sources used as the database for carrying out the study (dissertations, theses, articles, books, etc.);
- (iii) establish the temporal delimitation for the investigation;
- (iv) establish the methodological approach and the analytical techniques employed to treat the obtained data;
- (v) define the descriptors and categories of analysis used;
- (vi) search for the works of interest in the available databases;
- (vii) classify the obtained works according to the established descriptors;
- (viii) analyze the content of the works and organize the main data obtained (analysis sheets,



spreadsheets, tables, and graphs); (ix) carry out a qualitative analysis in relation to aspects and categories of interest for the investigation; (x) produce syntheses, partial results, and conclusions that help characterize the investigated production.

In this context, the execution of this stage proves essential for conceptually grounding the study, since it enables the identification of gaps and areas still scarcely explored within the investigated field. This process contributes significantly to guiding future research, broadening the understanding and deepening of the object under analysis, in addition to reinforcing the theoretical and methodological consistency of the investigation.

Methodology

The methodological procedure adopted was organized into three sequential stages. Stage 1, entitled *Initial Production Mapping*, consisted of the preliminary identification of the available studies. Stage 2, entitled *Refinement of Searches and Selection of Material*, involved the application of the previously defined inclusion and exclusion criteria in order to ensure the relevance of the works to the scope of the research. Finally, Stage 3, entitled *Mapping of Academic Production on Pedagogical Architecture in Distance Higher Education*, aimed to systematize and analyze the identified productions. The stages that comprise the adopted methodological procedure are described below, allowing for a clear and systematic understanding of each phase of the study.

With regard to data analysis, the thematic content analysis technique was adopted, as proposed by Bardin (2011), due to its suitability for qualitative studies focused on the interpretation and categorization of textual productions. This technique enabled the identification of recurring nuclei of meaning within the analyzed productions, allowing the organization of the data based on categories constructed throughout the investigative process.

The analysis was developed in three phases: (i) pre-analysis, involving floating reading and organization of the corpus; (ii) exploration of the material, with coding and categorization of the data; and (iii) treatment of the results



and interpretation, articulating the findings with the theoretical foundations of the study. This procedure enabled the systematic extraction of recurring themes from the 13 analyzed productions, ensuring methodological rigor and traceability of the interpretations.

The axes of analysis — conceptions, trends, and gaps — were constructed through a mixed analytical process, articulating deductive and inductive movements, as discussed by Creswell (2014). Initially, in a deductive manner, the axes were defined based on the research objectives and the theoretical framework of the field of Pedagogical Architecture and State of the Art studies (Teixeira, 2023; Jacomini et al., 2023). Subsequently, through an inductive movement, these axes were refined based on an in-depth reading of the selected productions, enabling the identification of recurrences, specificities, and emerging elements within the analyzed corpus. This process resulted in a denser and more contextualized analysis, articulating prior categories with empirical evidence derived from the investigated studies.

Although the adopted methodological design sought rigor and systematization, this study presents some limitations that must be considered. First, the delimitation of the databases — restricted to the CAPES Journal Portal and the CAPES Theses and Dissertations Catalog — may not encompass the entirety of national production, especially works published in other databases or institutional repositories.

Furthermore, the temporal delimitation (2014–2024), although justified by the framework of the National Education Plan, may have excluded relevant earlier productions that contributed to the initial consolidation of the field. Another aspect concerns the linguistic criterion, which prioritized productions in Portuguese, thereby limiting dialogue with international production.

Finally, the choice of descriptors, although theoretically grounded, may not encompass all the terminological variations used within the field, which may have impacted the retrieval of certain studies. Such limitations, however,



do not compromise the validity of the research, but rather indicate possibilities for expansion and further development in future investigations.

Initial Production Mapping

This stage comprised the definition of the databases, the spatial-temporal delimitation, and the spatial scope (national context), as well as the selection of search descriptors. The CAPES databases were used, especially the Theses and Dissertations Catalog (CTD) and the Journal Portal (PP), which gather qualified and updated scientific productions, enabling a representative mapping of national production. Furthermore, Coordenação de Aperfeiçoamento de Pessoal de Nível Superior plays a strategic role in scientific dissemination, in the training of researchers, and in the evaluation of *stricto sensu* graduate education (Brejo, 2007).

The temporal delimitation of the study covered the period from 2014 to 2024, a relevant milestone due to the approval of the National Education Plan (PNE 2014–2024), which establishes guidelines for the expansion and consolidation of Distance Education as a strategic public policy in Brazilian higher education (Brazil, 2014). According to Jacomini et al. (2023), the delimitation of this interval allows the construction of a comprehensive panorama of academic production, favoring the identification of trends, recurrences, and gaps within the investigated field.

With regard to the spatial delimitation, the study focused on national production, aiming to understand the specificities of the debate on Pedagogical Architecture within the Brazilian context. Such delimitation considered the particularities of educational policies, regulations, and local institutional contexts, contributing to the methodological consistency and relevance of the proposed analysis.

Regarding the descriptors, these were defined according to Romanowski (2002), who highlights the importance of selecting keywords capable of locating relevant productions, especially in State of the Art studies. The main



terms adopted were *Pedagogical Architecture*, *Higher Education*, and *Distance Education*, complemented by related descriptors such as distance teaching, DE, pedagogical design, university, and tertiary education. This selection was grounded in conceptual affinity with the object of study, aiming to broaden the scope and precision of the searches conducted.

Refinement of Searches and Selection of Material

This phase aimed to refine the initial search through the application of specific criteria for the selection of studies relevant to the scope of the research. Duplicate works within the consulted databases were excluded, as well as research not situated within the context of Distance Education, studies that did not address higher education within this modality, and productions presenting a superficial approach to the theme, without consistent analytical development in relation to the object of study.

The inclusion criteria prioritized research exclusively focused on Distance Education in higher education, addressing the theme of Pedagogical Architecture, with the presence of descriptors in the titles, abstracts, or keywords, in addition to national academic productions. This filtering process ensured greater precision and relevance to the analyzed corpus, providing consistency to the systematic analysis developed.

Mapping of Academic Production on Pedagogical Architecture in Distance Higher Education

This subsection outlined the panorama of academic knowledge on Pedagogical Architecture in higher education within the distance learning modality, encompassing the mapping of theoretical approaches, trends, and gaps present in national production. Based on the adopted methodological path, it was possible to construct a rigorous and coherent State of the Art study, offering a consistent foundation for the critical analysis of the selected material, as well as for the identification of central aspects essential to the understanding of the theme.



Systematization of the Results of the State of the Art on Pedagogical Architecture in Higher Education within the Distance Learning Modality

This phase systematized the obtained results, aiming to map and analyze academic production on Pedagogical Architecture in higher education within the distance learning modality. Through the intersection of descriptors such as “distance education,” “DE,” “pedagogical architecture,” “pedagogical design,” and “higher education,” 18 structured searches were conducted in the CAPES databases, using Boolean operators, ensuring precision, consistency, and comprehensiveness in the selection of sources.

The preliminary production identified is organized in Table 1, encompassing articles, theses, and dissertations from the CAPES Journal Portal and the CAPES Theses and Dissertations Catalog.

Table 1 – Frequency of the combinations of descriptors used in the searches in the CAPES databases

COMBINATIONS OF DESCRIPTORS USED IN THE SEARCHES	CAPES THESES AND DISSERTATIONS CATALOG (CTD)	CAPES JOURNAL PORTAL (PP)	TOTAL
“distance education” AND “pedagogical architecture” AND “higher education”	6	1	7
“distance education” AND “pedagogical architecture” AND “tertiary education”	2	0	2
“distance education” AND “pedagogical architecture” AND university	11	5	19
“distance education” AND “pedagogical design” AND “higher education”	1	2	3
“distance education” AND “pedagogical design” AND “tertiary education”	0	1	1
“distance education” AND “pedagogical design” AND university	3	1	4
DE AND “pedagogical architecture” AND “higher education”	0	1	1
DE AND “pedagogical architecture” AND “tertiary education”	0	1	1

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DE AND “pedagogical architecture” AND university	3	1	4
DE AND “pedagogical design” AND “higher education”	1	1	2
DE AND “pedagogical design” AND “tertiary education”	0	0	0
DE AND “pedagogical design” AND university	2	0	2
“distance teaching” AND “pedagogical architecture” AND “higher education”	5	1	6
“distance teaching” AND “pedagogical architecture” AND “tertiary education”	2	0	2
“distance teaching” AND “pedagogical architecture” AND university	7	1	8
“distance teaching” AND “pedagogical design” AND “higher education”	1	1	2
“distance teaching” AND “pedagogical design” AND “tertiary education”	0	0	0
“distance teaching” AND “pedagogical design” AND university	2	0	2
Total	46	17	63

Source: Adapted from Cavalcante and Nonato (2023, p. 28-29).

The analysis of Table 1 revealed that the greatest concentration of academic productions on Pedagogical Architecture in DE is found in the Theses and Dissertations Catalog (46 occurrences), in comparison with the Journal Portal (17 records), with a predominance of descriptors such as distance education, pedagogical architecture, and higher education.

In the subsequent stage, the refinement of searches was carried out based on previously defined inclusion and exclusion criteria, resulting in the elimination of duplicate, superficial, or misaligned studies in relation to the scope of the research.

Figure 2 presents the classification of the productions identified in the Journal Portal, highlighting the proportion between relevant, duplicate, and non-adherent studies in relation to the theme.



Figure 2 – Classification of the Productions Identified in the Journal Portal

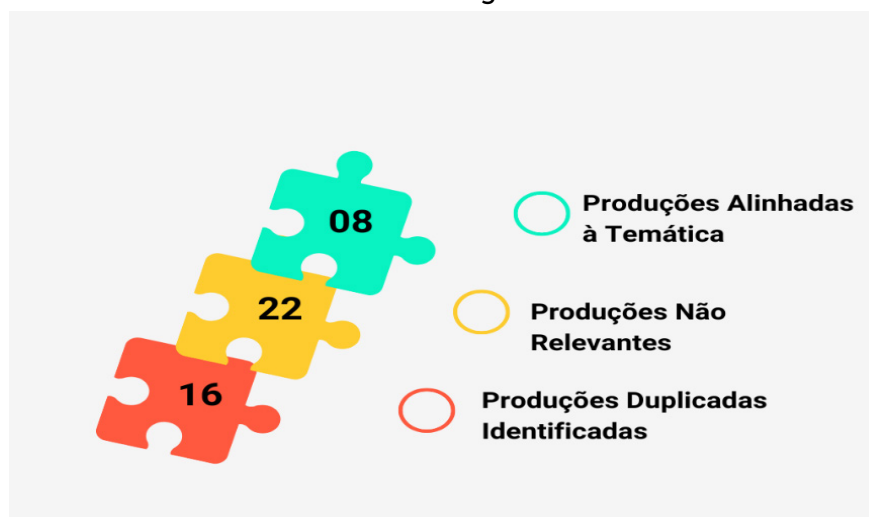


Source: Prepared by the authors (2026)

In the Theses and Dissertations Catalog, the refinement process revealed that, out of the 46 productions initially identified, only 8 were effectively aligned with the object of study. This result highlights the importance of adopting rigorous selection criteria for the constitution of a consistent analytical corpus.

Figure 3 presents the distribution of productions according to the criteria of relevance, duplication, and thematic adherence.

Figure 3 – Classification of the Productions Identified in the Theses and Dissertations Catalog



Source: Prepared by the authors (2026)



From this process, the final corpus of the research was defined, composed of productions that fully met the established methodological criteria. Table 2 consolidates these productions, organized by year, authorship, and type of publication.

Table 2 - Selected Academic Productions on Pedagogical Architecture in Distance Education

YEAR	TITLE	AUTHOR(S)	TYPE OF PUBLICATION
2014	From doing to understanding in the context of Distance Education: the use of pedagogical architectures in the entrepreneurial process	Ana Michels Beatriz	Master's Thesis
2015	Pedagogical model for the development of teaching competencies in Accounting through Distance Education	Maria Vendruscolo Ivanice	Doctoral Dissertation
2016	Pedagogical models and competencies in Distance Education: the construction of MP-CompEAD	Patrícia Behar; Schneider Alejandra Daisy	Scientific Article
2016	Pedagogical architecture for building management competencies through business simulators	Gabriel Schlatter Vianna	Doctoral Dissertation
2018	A pedagogical architecture to represent digital learning portfolios	André Luiz do V. Soares; Alberto N. de Castro Jr	Scientific Article
2019	ARQPED-MOBILE: a pedagogical architecture focused on mobile learning	Anna Silveira Helena Sonego	Doctoral Dissertation
2019	MP-SOCIOAVA: a pedagogical model focused on social interactions within a Virtual Learning Environment	Ana Ribeiro Carolina Ribeiro	Doctoral Dissertation
2020	Distance Education in the continuing education of university staff: a proposal for pedagogical design using problem-based learning	Evanice Pereira Alves	Master's Thesis
2021	Supervised internship in Mathematics teacher training, in the distance learning modality: reflections of the pandemic	Helenice Costa; Douglas Arlindo Souza Maria Araújo; Marín; José de	Scientific Article
2021	Teacher training: the teacher's awareness of the concept of pedagogical architectures based on learning experiences	Lucicleide da Silva	Doctoral Dissertation

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2021	Distance Education, active methodologies, and hybridity: a pedagogical design for higher education within the blended curriculum components of UNEB	Cezar Roberto Sarly da Silva	Master's Thesis
2022	Teacher self-training for digital interface mediation: co-creation experiences in a network context during the physical distancing imposed by the COVID-19 pandemic	Kathia Marise Borges Sales; Jader Cristiano M. Albuquerque; Edmea dos Santos	Scientific Article
2023	Pedagogical architecture for new digital learning objects: affective computing	Gustavo Luiz Gava; Mariana Haviaras	Scientific Article

Source: Developed by the author (2025)

The analysis of the scientific productions revealed multiple perspectives on Pedagogical Architectures applied to distance education in higher education. Thus, Table 3 systematizes the mapped works, highlighting the theoretical conceptions, emerging trends, and existing gaps, providing a detailed and organized panorama of these studies.

Chart 3 – Overview of Scientific Production on Pedagogical Architecture in Distance Education

YEAR	AUTHOR(S)	SYSTEMATIZATION OF THE WORKS: CONCEPTIONS, TRENDS, AND GAPS
2014	Ana Beatriz Michels	<p>Conception: Pedagogical architecture is seen as a system of theoretical premises that guides practices and interactions within the distance learning environment, involving organizational, methodological, and technological elements in constant interrelation.</p> <p>Trend: Pedagogical architecture as an enhancer of meaningful learning, especially by creating cooperation networks, pedagogical innovation, and the gradual growth of the subjects' autonomy.</p> <p>Gap: Persistence of reproductive practices and an absence of strategies that favor full participation, student agency, and collaboration among those involved in distance higher education.</p>



2015	Maria Ivanice Vendruscolo	<p>Conception: The dissertation adopts Piaget's Genetic Epistemology and the concept of Pedagogical Architecture developed by Patrícia Behar as its theoretical foundation. Pedagogical Architecture is understood as the set of theoretical and structural premises (organizational, methodological, content-related, and technological) that guide pedagogical practice in distance education courses, aiming to promote autonomy, student agency, interaction, and the development of competencies, especially through the use of ICT.</p> <p>Trend: Value placed on strategies geared toward active learning, interdisciplinarity, the use of projects and problem-solving, and an emphasis on competencies related to the professional context.</p> <p>Gaps: Lack of pedagogical training and faculty qualification in ICT, which hinders the full appropriation of the potential of pedagogical architectures within the context of distance higher education.</p>
2016	Patrícia Alejandra Behar; Daisy Schneider	<p>Conception: Pedagogical Architecture comprises the integration of organizational aspects (such as purposes, time, space, and participant roles), methodological, technological, and content-related dimensions, seeking to form a harmonious, dynamic, and integrated whole aligned with the formative process and the demands of distance education.</p> <p>Trend: Value placed on active mediation, continuous feedback, individualized monitoring, and encouraging participant autonomy.</p> <p>Gaps: Need for greater reinforcement and pedagogical training, especially for teachers, tutors, and teams involved with distance education resources and methodologies.</p>
2016	Gabriel Vianna Schlatter	<p>Conception: Pedagogical Architecture is understood as a structure that integrates organizational, technological, methodological, and content-related aspects to guide pedagogical practices using business simulators.</p> <p>Trend: Growing use of business simulators as a tool for active learning and the development of managerial competencies.</p> <p>Gap: Need for a broader and more diversified evaluation of the effectiveness of the proposed architecture across different contexts and student profiles.</p>



2018	André Luiz do V. Soares; Alberto N. de Castro Jr	<p>Conception: The proposed Pedagogical Architecture is based on a constructivist pedagogical model, focused on processes of mediation, cooperation, and formative assessment. This architecture formalizes portfolios as instruments that evidence learning over time, enabling qualitative analyses of student development.</p> <p>Trend: Expansion of the use of technology-mediated self-assessment and collaborative processes within the context of Pedagogical Architecture.</p> <p>Gap: Need for greater formalization and standardization of pedagogical architectures for digital portfolios, aiming to facilitate replication and use in different contexts.</p>
2019	Anna Helena Silveira Sonego	<p>Conception: ArqPed-Mobile considers four fundamental aspects: organizational, content, methodological, and technological, which interrelate with pedagogical strategies to promote mobile learning (m-learning). The architecture guides the planning and implementation of pedagogical activities with mobile devices, aiming to expand communication, production, and information sharing anywhere and anytime. It emphasizes that the architecture should not be simply replicated, but adapted to the audience, context, and available resources.</p> <p>Trend: Adaptation of the Pedagogical Architecture according to distinct contexts and technological availability.</p> <p>Gap: Challenge in adapting and personalizing pedagogical architectures for different audiences and educational realities, especially considering technological limitations in certain environments.</p>
2019	Ana Carolina Ribeiro Ribeiro	<p>Conception: The Pedagogical Architecture proposed in MP-SOCIOAVA integrates organizational, methodological, technological, and content-related aspects, which are articulated to strengthen social interactions within virtual learning environments.</p> <p>Trend: The analyzed studies highlight the strengthening of Pedagogical Architectures and strategies focused on relationships between students and between students and teachers. The research shows that such interactions are fundamental to sustaining student motivation and effective participation in distance education, overcoming the reductionist view that this modality necessarily implies isolation.</p> <p>Gap: Need for further development and application of pedagogical architectures focused on social connections to increase student engagement.</p>



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2020	Evanice Alves Pereira	<p>Conception: Pedagogical Architecture is understood as an integrated structure that organizes organizational, methodological, technological, and content-related aspects to promote a pedagogical design centered on Problem-Based Learning (PBL) within the context of the continuing education of university staff via distance education.</p> <p>Trend: Focus on learning from real-world problems, the use of digital technologies for autonomy and collaboration, and the integration between theory and practice.</p> <p>Gap: They indicate a need for training, adequate infrastructure, and more systematic evaluations for the effective implementation of the Problem-Based Learning (PBL) model in distance education.</p>
2021	Helenice Maria Costa Araújo; Douglas Marín; Arlindo José de Souza	<p>Conception: Pedagogical Architectures (PA). The presented conception emphasizes that the Pedagogical Architecture must consider organizational, technological, methodological, and content dimensions, promoting an integrated environment that facilitates interaction, support, and the development of students' competencies, especially in the remote scenario imposed by the pandemic. It emphasizes the role of the VLE (Virtual Learning Environment) as a mediator of this architecture to ensure continuity in training despite in-person limitations.</p> <p>Trend: Design of Pedagogical Architectures that promote greater student autonomy, stimulating the construction of knowledge through action, critical reflection, and collaboration.</p> <p>Gaps: Challenges to guarantee active participation and student engagement in the distance-supervised internship.</p>
2021	Lucicleide da Silva	<p>Conception: Architecture is understood as an integrated system that articulates organizational, technological, methodological, and content dimensions, guiding pedagogical practices adapted to the distance education context. The conception emphasizes the teacher's process of developing an awareness (awareness-raising/taking consciousness) regarding pedagogical architectures, which involves understanding and assuming a creative role in the design and use of the architecture to mediate teaching-learning processes.</p> <p>Trend: Growing valuation of teacher autonomy and active participation in the elaboration and adaptation of pedagogical architectures.</p> <p>Gap: Lack of specific and continuous training that qualifies teachers for the development and critical use of pedagogical architectures.</p>

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2021	Cezar Roberto Sarly da Silva	<p>Conception: Pedagogical Architecture is conceived as a design that integrates active methodologies and blended learning for hybrid curricular components. It is a structured system that articulates methodological, technological, organizational, and content aspects, aiming to make teaching more flexible, promote student autonomy, and foster engagement through collaborative and interactive activities.</p> <p>Trend: Pedagogical Architecture adapted to contemporary blended learning realities, seeking innovation, quality, and greater active participation from students.</p> <p>Gap: Despite the advances, there are still gaps related to the systematization and evaluation of Pedagogical Architectures in real distance and blended education contexts. There is a lack of studies that consolidate instruments, indicators, and strategies capable of supporting teachers in the consistent implementation of these architectures, considering different areas of knowledge, student profiles, and diverse institutional contexts.</p>
2022	Kathia Marise Borges Sales; Jader Cristiano M. Albuquerque; Edmea dos Santos	<p>Conception: Pedagogical Architecture is conceived as an open, collaborative, and networked design, in which the digital environment serves as a space for mediation but does not determine the quality of education; the key differentiator lies in the collaborative interaction and co-creation between teachers and students. The emphasis is on the subjects' self-training, which develops pedagogically through dialogue, sharing of experiences, and the intelligent use of networked digital technologies.</p> <p>Trend: A clear trend emerges toward integrating active methodologies into networked pedagogical mediation, enhancing formative processes in contexts of physical distancing. The model highlights the use of discussion groups (rodas de conversa) and digital artifacts as interaction devices, expanding the flexibility of time and space, and promoting more collaborative, innovative, and open teaching practices.</p> <p>Gap: Difficulties persist in the effective appropriation of technologies for the mediation of innovative pedagogical practices.</p>



2023	Gustavo Luiz Gava; Mariana Haviaras	<p>Conception: Pedagogical Architecture is oriented toward the affective design of Digital Learning Objects (DLOs), aiming to promote a sense of belonging among students in virtual learning environments. In this perspective, the cognitive (neurocognitive) dimension is integrated with the pedagogical and technological design of the VLE, considering emotion, affect, and context as structuring elements of learning.</p> <p>Trend: A trend is observed toward rethinking cyberspace beyond vertical and transmissive models, incorporating principles of neuroarchitecture, neurodesign, and neuroergonomics into the development of DLOs and VLEs. It seeks to enhance hybrid and inclusive learning, exploring environments that favor creativity, a more fluid human-machine interaction, decision-making, and affective-cognitive experiences that stimulate student engagement.</p> <p>Gap: There is a lack of solid frameworks on how to promote effective affective relationships in digital environments based on Pedagogical Architecture.</p>
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Source: Developed by the authors (2026)

The analysis of the works mapped in Table 3 reveals relevant contributions from several authors to the understanding of Pedagogical Architecture in higher education within the distance learning modality during the period from 2014 to 2024. Michels (2014), Vendruscolo (2015), Behar and Schneider (2016), and Schlatter (2016) conceive Pedagogical Architecture as an integrated system that articulates organizational, methodological, technological, and content dimensions, guiding innovative practices that foster student autonomy and cooperation mediated by the teacher.

Sonego (2019), Ribeiro (2019), Pereira (2020), Araújo, Marin, and Souza Junior (2021), and Silva, L. (2021) emphasize the centrality of active pedagogical mediation, collaboration, and the use of technologies, while also highlighting weaknesses related to teacher training and institutional adaptation. Furthermore, Sales, Albuquerque, and Santos (2022) propose a collaborative and open model, whereas Gava and Haviaras (2023) emphasize the affective design of digital objects as a strategy to promote students' sense of belonging.

Taken together, these studies indicate an evolution in the conception of the field, marked by the incorporation of theoretical and technological



advances, although challenges related to teacher training and the evaluation of pedagogical practices still persist.

The authors, through their contributions, highlight central trends for Pedagogical Architecture in higher education within the distance learning modality during the period from 2014 to 2024. Michels (2014) emphasizes the relevance of collaborative networks for promoting meaningful learning, while Vendruscolo (2015) stresses active and interdisciplinary approaches based on projects and problem-solving. Behar and Schneider (2016) point to the importance of active pedagogical mediation, with continuous feedback, whereas Schlatter (2016) highlights the use of simulators as a strategy for the development of competencies.

From a broader perspective, Soares and Castro Junior (2018) and Sonogo (2019) incorporate dimensions such as self-assessment processes mediated by technologies and the adaptation of architectures to specific technological contexts. Ribeiro (2019) underscores the centrality of virtual social interactions in student motivation, while Pereira (2020) addresses Problem-Based Learning (PBL) as a strategy for articulating theory and practice in digital environments. Araújo, Marin, and Souza Junior (2021) emphasize the promotion of autonomy, critical reflection, and collaboration, whereas Silva, L. (2021) reinforces the active role of the teacher, and Silva, C. (2021) projects advances related to hybrid teaching and active methodologies.

Taken together, these trends point to a field in increasing integration, marked by the articulation between collaboration, technological innovation, and student protagonism, aiming at strengthening students' autonomy and participation in learning processes.

The analyzed studies reveal significant gaps in the consolidation of Pedagogical Architecture in distance higher education between 2014 and 2024, particularly the insufficiency of teacher training for the critical use of digital technologies (Behar; Schneider, 2016; Silva, L., 2021; Vendruscolo, 2015), the persistence of reproductive practices that limit student autonomy



(Michels, 2014), and the absence of systematization and consistent evaluation of architectures in real contexts (Silva, C., 2021). Weaknesses are also identified in the formalization of pedagogical models (Soares; Castro Junior, 2018), in the incorporation of affective dimensions in digital environments (Gava; Haviaras, 2023), and in the appropriation of technologies in networked pedagogical mediation (Sales; Albuquerque; Santos, 2022).

Such gaps reveal structural and pedagogical challenges that still limit the advancement of the field, indicating the need for more in-depth analyses. In this sense, the following section presents a thematic analysis of the findings, organized into axes that allow for a comparative understanding of the conceptions, trends, and gaps identified in the investigated productions.

Thematic Analysis and Discussion of the Findings

The analysis of the productions mapped and systematized in Table 3 makes it possible to advance from a descriptive approach to a comparative interpretation of the findings, organized into thematic axes that highlight convergences, divergences, and evolutionary movements in the field of Pedagogical Architecture in Distance Education.

With regard to the conceptions of Pedagogical Architecture, a convergence among the studies can be observed in understanding it as an integrated system that articulates organizational, methodological, technological, and content dimensions. Works such as those by Behar and Schneider (2016), Vendruscolo (2015), and Schlatter (2016) reinforce this structuring perspective, indicating a process of conceptual consolidation throughout the analyzed period. However, although there is theoretical consistency, propositions that advance toward systematized operational models applicable to different contexts remain limited.

Regarding active methodologies, there is evidence of a growing trend toward the incorporation of approaches such as problem-based learning, the use of simulators, and collaborative strategies, as pointed out by Pereira (2020),



Vendruscolo (2015), and Silva, C. (2021). These studies indicate a progressive shift from transmissive practices toward proposals centered on student protagonism. Nevertheless, this movement coexists with gaps related to the effective implementation of such methodologies, especially concerning teacher training and the institutional conditions necessary for their consolidation.

Within the axis of social interactions, the centrality of relationships among students and between students and teachers stands out as a structuring element of learning in Distance Education. Research such as that of Ribeiro (2019) and Sales, Albuquerque, and Santos (2022) highlights the relevance of collaborative practices and networked pedagogical mediation, pointing toward overcoming the notion of isolation traditionally associated with this modality. Even so, challenges related to student engagement and effective participation persist, especially in contexts marked by technological and institutional limitations.

Concerning affective dimensions, a more recent movement can be observed — especially from 2020 onward — toward valuing affection, belonging, and the student experience in digital environments. Studies such as those by Gava and Haviaras (2023) indicate an expansion of the field by incorporating contributions from affective computing and neuroscience. This axis reveals a significant change in the understanding of Distance Education, which begins to consider not only cognitive aspects but also emotional and relational dimensions in the learning process.

The longitudinal analysis of the productions allows the identification of an evolutionary movement in the field, transitioning from more structural conceptions of Pedagogical Architecture (2014–2016) to more complex and integrated approaches (2019–2023), incorporating dimensions such as mobility, affectivity, and networked collaboration. However, this advancement does not occur homogeneously, being marked by asymmetries both in the production and in the application of the proposals.

It is also noteworthy that the number of identified studies remains limited. Despite the growing relevance of Distance Education in Brazilian higher



education, the number of productions specifically focused on Pedagogical Architecture remains restricted. This scenario may indicate that the field is still undergoing a process of theoretical and methodological consolidation, in addition to reflecting the terminological dispersion within the area, in which related studies do not always explicitly use the term “Pedagogical Architecture,” thereby making their identification in systematic searches more difficult.

This quantitative limitation reinforces the need to expand investigations, especially those that articulate theory and practice in real implementation contexts, contributing to the strengthening and greater visibility of the field within the Brazilian educational scenario.

Final Considerations

The final considerations demonstrate that Pedagogical Architecture in higher education within the distance learning modality constitutes an expanding field, marked by conceptual and methodological advances, especially in the integration of organizational, methodological, technological, and content dimensions oriented toward student autonomy and collaborative pedagogical mediation.

However, gaps related to teacher training for Distance Education, the absence of systematization and evaluation of architectures in real contexts, and the persistence of reproductive practices still remain, indicating structural and pedagogical challenges within the field.

From a methodological perspective, the study presents limitations regarding the databases used (CAPES), the temporal scope (2014–2024), the linguistic criterion (Portuguese language), and the choice of descriptors, which may not encompass the entire production in the area. Such aspects do not compromise the results, but they indicate possibilities for expansion in future research.

In terms of implications, the need for investments in teacher training and in the institutionalization of planning and evaluation processes for Pedagogical



Architectures is highlighted, aiming to improve practices in Distance Education. Finally, the development of studies that articulate theory and practice in real contexts is recommended, as well as the exploration of emerging dimensions, such as affectivity, mobile learning, and the use of advanced digital technologies, contributing to the strengthening and consolidation of the field.

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Note

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