The Need for a Scientific Research Paradigm Understanding and Clarification in Algerian Architecture Departments

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Abstract   This article highlights the problem of scientific research in the field of architecture discipline and takes Algerian universities as a study case. It presents and discusses research paradigm problems in academic architecture research and aims to perform a content analysis of architecture, urbanism, and built environment doctoral theses submitted in different architectural departments. Understanding and correctly applying a research paradigm is of capital importance in any research. It guides the research by controlling its evolution and the relevance and coherence of the research approach. Above all, paradigmatic positioning allows the establishment of research validity and legitimacy. So, this article aims to analyze the main paradigms of research and their respective philosophical principles, to understand the methodological problem of research paradigm identification and its crucial role in scientific research regarding architecture, urbanism, and built environment in Algerian universities. Therefore, several doctoral theses in various specialities in architecture and urbanism were analyzed to determine their research paradigm and whether the ontological, epistemological, and methodological points of view were respected according to the logic of every paradigm. The article stresses the importance of reviewing some traditional models of knowledge that still dominate, in an erratic way, the world of scientific research in the field of architecture and urbanism. The article showed that research paradigms are not identified and clarified, and a big part of the selected theses do not respect research standards in each paradigm philosophy.

Keywords   Scientific Research, Paradigm of Research, Architecture Studies, Research Approach, Pragmatism

1. Introduction

Scientific research allows researchers to deepen their knowledge in the field of research. It is the means that enables them to produce or develop scientific knowledge. It consists of a rational and organized approach that aims to study and understand unknown areas in research. Scientific research consists of a creative process that allows for innovation by formulating new questions and producing new knowledge.

Thus, in scientific research and before initiating the process of knowledge acquisition, the identification of the scientific researcher's philosophical approach or the paradigm of research is needed. Thus, scientific researchers should adequately locate their investigation into a paradigm and justify its choice.

In other words, the paradigm of research is the basis of any scientific work and consists of the researcher's philosophical thoughts and personal beliefs of the world and how he should guide the knowledge acquiring (Guba, & Lincoln, 1994, p.105). The research paradigm guides the researcher in selecting the object of his research, deciding which methodological approach is suitable and interpreting the research results. The goal should be to facilitate the students to become self-learners rather than depend on faculty as a key source of information [1].

A research paradigm consists of ontological, epistemological, and methodological points linked to the researcher's abstract beliefs. Thus, several paradigms are available for the scientific researcher who need to understand the strengths and weaknesses of each one profoundly and select the more appropriate one for their work.

In Algerian universities, in architecture, urbanism, and built environment, the identification of research paradigms is a critical issue. The researchers in this field are ironically following traditional knowledge acquisition models, which impose objectivity, generalizability, and the verifiability of research results. Within these traditional models, researchers in architecture and built environments find enormous difficulties applying validation criteria and end their supposedly scientific works with elements that have nothing to do with the chosen paradigms.

Based on documentary research and content analysis of doctoral theses in architecture, urbanism, and built environment, this paper discusses the following questions: in the field of A.U.B.E, what are the primary research paradigms applied in Algerian universities and their philosophy? Can they be correctly involved in architecture, urbanism, and the built environment? What is the more appropriate paradigm of research to be logically applied in the case of architecture, urbanism, and built environment?

This research aims to analyze the main paradigms of research and their respective philosophical principles, to understand the methodological problem of research paradigm identification and its indispensable role in scientific research regarding architecture, urbanism, and built environment in Algerian universities. Finally, the final purpose of this paper is to present the best way to approach results in the research field of architecture, urbanism, and the built environment.

2. Methodology

This research is based on documentary research to achieve this qualitative paper's purposes. Readings and analyses have been done on paradigms of research types and philosophical principles, the applicability of these paradigms in general terms, and the possibility of applying themes to architecture, urbanism, and the built environment field.

To understand the failure or success of scientific research methodological approaches in the Algerian case, the research methodology of this paper is also based on content analysis of doctoral theses submitted in different architecture departments in Algeria. The content analysis will focus on identifying the research paradigm, whether it was determined, and if its ontological, epistemological, and methodological visions were correctly applied.

Accessible, relevant, and interesting theses in the studied field need to be identified for content analysis. Thus, many documents were identified using the institutional repository DSpace of the universities where doctoral theses (architecture, urbanism, and built environment) are available and accessible. The sample was accessed by keywords related to research (architecture, urbanism, and built environment).

3. Literature Review

In Algeria, research approaches such as qualitative and quantitative approaches are more discussed than their philosophical foundation and their adequacy to the research topic. The research paradigm consisted of a beliefs model that frames the perception of a research community within a peculiar case. The researchers' beliefs model adequately answers ontological, epistemological, and methodological issues.

The research paradigm deals with the nature of reality (the purpose of scientific research) and whether it exists. It addresses the epistemological concerns of how researchers can be investigated and produce knowledge.

Therefore, pragmatic positioning is an important step that a researcher in architecture, urbanism, and built environment should identify.

3.1. The Problem of Research in Architecture

The classical research approach heavily influences research in architectural schools in Algeria. In most universities and academic institutions, the traditional definition of research is the most dominant. The latter originated in the classical positivist science model highlighting objectivity, verifiability of research hypothesis and generalizability of results. In this framework, research in architecture is considered to be non-scientific by its intrinsic bias because it makes part of arts and does not match with the high rank of science; it emphasizes subjectivity, the multiplicity of results interpretation, and the sturdy of meaningful items that cannot be expressed explicitly, which go against the classical model of research.

The paradigm of research discussed in this article comes against the vast domination of positivist science in the research sphere in most academic institutions, particularly in architectural research. The concept introduced by

Thomas Kuhn consists of the philosophical framework constituting an accepted and valid contribution to a field. Hence, a research proposal should specify an accepted model of research in which the questions, issues or problems will be addressed.

According to Sanford Kwinter, applying a classical positivist vision to architecture research can be difficult [2]. Architecture research is seen as more creative than science. However, according to the same author, architecture makes part of science because it has the capacity of model-building through creating ideas: *Science is about model-building, not facts. Every experiment is a model, a form imposed on a piece of the world to produce an effect, isolate a behavior, and generate a fact that can be transposed to another milieu. [...] Any practice [...] which approaches this place and world with something other than superstitious and magical attitude, is fundamentally science*. James Snyder adds by defining research in architecture as *systematic inquiry directed toward the creation of knowledge*. In Snyders definition, the creation process of knowledge in architecture demarks from the classical research vision (through experiments). It is systematic, meaning that the research method is essentially based on collecting, categorizing, analyzing, and presenting information for small-scale or large-scale interventions [3].

In contrast with the classical vision of research describing the world's universal properties (past and present), a researcher in architecture has the particularity to deal with a specific property of a future [4]. Félix Solaguren-Beascoa believes that it would be worth asking if it makes sense to investigate what has already been done or what is unknown, if architecture research should focus on past or present issues or, on the contrary, bet on working in future matters. For some, the first thing is to conserve, the second is to give an opinion, and the third is to risk, which is, ultimately, what would give meaning to a possible investigation. Research and reflection are intimately linked. Many other factors come into play, but the main one is to put and establish a relationship, even in a heterogeneous way, with things and never forget that the central nucleus must be architecture [5].

So, research in architecture is possible, and an architect can write a PhD because research is now understood as knowledge creation [6] which enlarges the spectrum of scientific research to include tacit knowledge. This notion points out that knowledge relies more on social processes and is created through a continuous dialogue between implicit and explicit knowledge.

3.2. What is Needed for Architecture Education

Many academic institutions have adopted the new vision and tried to define research in the area of architecture and how it can be identified and evaluated. Among others, Arts and Humanities Research Council (A.H.R.C.) finance academic research in humanities and arts and consider research in terms of its process rather than its outcomes. This definition is built up around three (3) key aspects:

(1) The research must define a series of questions, issues, or problems that will be addressed. It must also set goals aiming at increasing knowledge of the subject addressed.

(2) The research proposal must specify a context in which the questions, issues, or problems will be addressed. The researcher must identify why it is essential that the questions be considered, other studies or research conducted in the same area, and the particular contribution of the research project in terms of creativity.

(3) The research proposal should specify the methods used to study and answer the questions, issues or problems, and how he intends to answer the questions. Also, he explains how the method will provide the most appropriate means of analyzing the research questions.

According to the A.H.R.C. definition of research, one can engage in professional practice as an integral step in academic research. However, it expects this process to be documented and accompanied by some form of explanation that enriches the theoretical position or demonstrates critical reflection.

In line with the A.H.R.C., but in a larger context, the European association for architectural education aims to organize architectural schools and advance the quality of architectural education and Research in Europe. The association contributed by the creation of a charter on architectural research to be a reference document available for the use of researchers in architecture. The charter defines research in architecture as an original investigation aiming at generating knowledge, insights and understanding by implementing competencies, adequate methods and tools. The charter points the particularity of research in architecture has its base mode, scope, tactics and strategies [7].

The E.A.A.E. charter of architectural research highlights the importance of viewing architectural research from the viewpoint of different disciplines (trans and interdisciplinary): *By embracing aspects of rationality and intuition, objectivity and intersubjectivity, technique and emotion, logic and creativity, architectural research enrich the understanding of the world* [8].

Hence, research in architecture seems inclusive of multiple research schools of thought. It requires multidisciplinary qualities that one only epistemological framework would be insufficient to address the research problems. This idea isn't new and dates back to Vitruvius's first book of architecture: *The architect should be equipped with knowledge of many branches of study and varied kinds of learning, for it is by his judgment that all work done by the other arts is put to the test. This knowledge is*

the child of practice and theory [9].

Thus, it is central to distinguish between the different research paradigms within which a preference for a certain one may be observed. But it will be crucial that all these paradigms are available to architectural research. They should be correctly understood and applied to help the doctoral student expand his architectural knowledge.

3.3. The Need for Research Paradigms Identification

As stated above, a new research school of thought started to recognize the contribution of architectural research to knowledge and what has been done for a long time. The recognition of practice as part of research gave architectural research a place to create new realities.

Hence, the basis of architecture research education should be based on an inclusive and generative process; a doctoral student in architecture should have broad knowledge to navigate the different research paradigms surrounding the discipline.

Thomas Kuhn, an American philosopher, first used the word paradigm in his book *The Structure of Scientific Revolutions* to describe a researcher's philosophical way of thinking. It is a set of epistemological, theoretical, and conceptual elements that serve as a frame of reference for the community of researchers in a particular scientific field [10]. In addition to these epistemological elements, such as

prestigious research results, founding experiences, beliefs, and values are shared by a group of researchers. It is also described as a researcher's "worldview" [11], which is the perspective of thinking, school of thought, or set of shared beliefs that inform the meaning of the interpretation of research data [12].

A paradigm acts as a perceptual and cognitive mechanism within scientific research that transforms "reality" into representation [13]. This mechanism is a selection and decomposition intended to make reality intelligible. In other terms, the research paradigm is a transformative process implemented by the researcher to construct the scientific object of his research.

Therefore, pragmatic positioning is crucial in a particular discipline because it provides beliefs and dictates what should be studied, how it should be achieved, and how research data should be analyzed and interpreted.

According to the literature, multiple research paradigms can be offered to researchers in various fields. However, they can be grouped into three main typologies: Positivist, interpretive, and pragmatic.

3.4. Elements of A Research Paradigm

A research paradigm comprises four (4) elements (Figure 1), namely epistemology, ontology, and methodology [14].
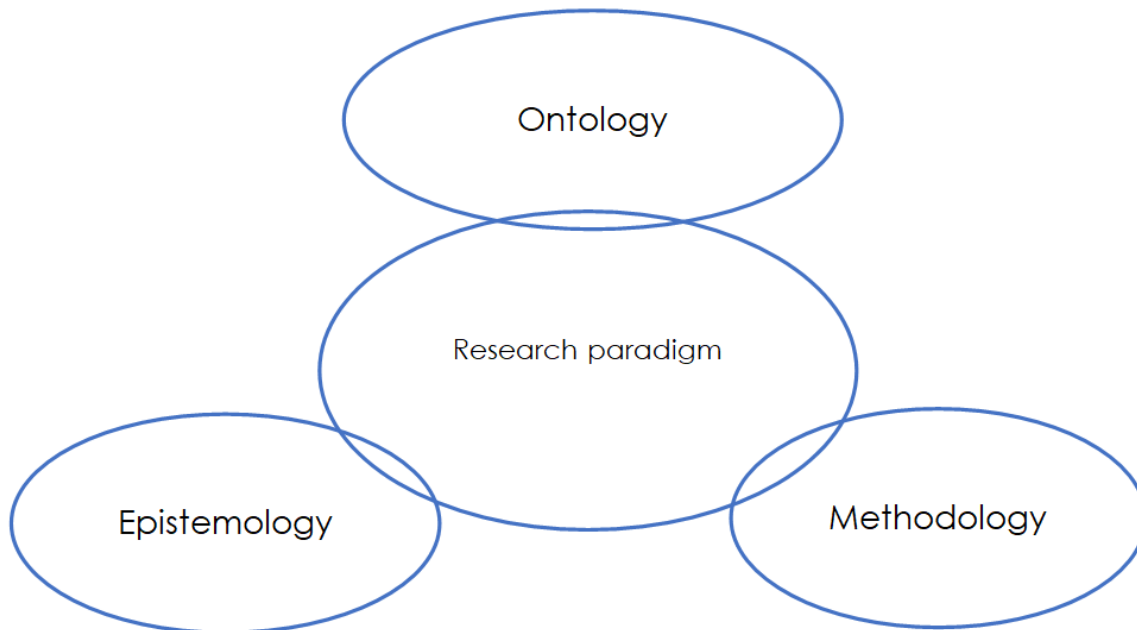
Source: Authors

Figure 1. Elements of the research paradigm

3.4.1. Epistemology

The source of this term is Greek. It comes from Episteme, which means knowledge. It is used in scientific research to describe the first element of a research paradigm and refers to how a researcher comes to know the truth or reality about the research subject. In other terms, epistemology is concerned with the nature of knowledge and how it can be acquired.

Therefore, adopting a research paradigm is often the consequence of an epistemological choice. According to Jean Piaget, epistemological selection involves studying useful knowledge's constitution [15].

Thus, understanding the epistemological element of a research paradigm is vital to ask how we can know the truth. What can be considered valid knowledge? These questions are essential because their contribution to knowledge is the most important criterion by which research works are judged.

So, epistemological positioning is essential because it establishes how the researcher will investigate knowledge.

3.4.2. Ontology

Ontology is the second pillar of a research paradigm. The ontology of research deals with the nature of reality. In general, ontology is defined as the meaning given to "reality"; is there only one reality or several realities? It helps you to determine the form and nature of reality and what the researcher believes may be uncovered in this reality.

Taking an ontological position is essential to a research paradigm because it helps the researcher decide about the research problem and its importance and how he should investigate and contribute to the solution of the research problem. Ontology makes the researcher ask a question about the nature of reality. Otherwise, it seeks to determine whether the reality of the studied situation is objective and the product of people's perceptions.

Accordingly, the ontology of research is associated with two essential aspects; objectivism and subjectivism. An objectivist researcher believes that reality is unique and external to social actors (it cannot be evaluated directly); it is independent of the researcher who describes it. On the other hand, there is no single reality for exploring a problem. The subjectivist researcher's objective is to understand and consider the context and people's perceptions. According to this second approach, reality is constructed in the context studied because different contexts produce different realities.

3.4.3. Methodology

The methodology is the third pillar of a research paradigm. It represents all the methods and techniques a researcher adopts to reach one or more conclusions during his particular research field. According to John keeves, the term methodology refers to the research design, methods, approaches, and procedures implemented in an investigation and adequately arranged to discover interesting knowledge [16].

A research methodology enables the researcher to ask how the process of gathering data should be, which should allow answering the research problem and, therefore, contribute to knowledge.

In general terms, there are two types of methods used in any field of scientific research; the quantitative approach and the qualitative approach. The choice of one of the approaches depends on the type of research question and the means available to collect research data. Funding also plays a fundamental role in determining the research approach.

3.5. Main Research Paradigms

Several research paradigms exist in the literature, but the three most established ones are positivism, interpretivism, and pragmatism (Table 1).

Table 1.   The difference between positivism and interpretive paradigm

Paradigm	Ontology	Epistemology	Methodology
Positivism	Single and absolute truth or reality	Objectivist; Reality can be attained and measured, and the process can be verified.	A firm methodology based on Experimental strategies
Interpretivism	There are multiple realities, not a single one	In subjectivist epistemology, reality, or truth, is socially constructed	Naturalist methodology based on qualitative approaches
Pragmatism	Reality is constantly renegotiated, debated, and interpreted in light of its usefulness in new unpredictable situations	The best method is the one that solves problems	Mixed method, design-based method, action research

Source: From various sources

3.5.1. Positivism

Positivism is a philosophical branch that appeared at the beginning of the 19th century thanks to the French sociologist and philosopher Auguste Comte's efforts to apply a natural science view of sociology.

According to the father of positivism, the wish of this philosophical current is that knowledge will inevitably progress by going into predefined stages, never by going backwards or advancing towards unforeseen directions. He places religion at the bottom of these priorities by calling it fiction: «From the study of the development of human intelligence, in all directions, and through all times, the discovery arises of a great fundamental law. Each branch of our knowledge passes successively through three different theoretical conditions: the theological; the metaphysical or abstract; and the scientific, or positive" [17]. Thus, positivism was introduced as a reaction to theological and metaphysical as traditional epistemological means of knowledge. Positivism only supports the knowledge that results from verified experiences.

From an ontological point of view, this first research paradigm believes that reality exists independently of social actors and experiences. Positivist researchers try to understand the social world by applying a natural science view. This latter's researchers investigate immutable laws among phenomena and explain them only through the cause-effect relationship. However, the given justifications should not depend on the researcher's point of view, time, or place; they should be context-free and generalizable, which means if different researchers work in other times and places, they will find the same conclusions.

From an epistemological point of view, this first research paradigm believes that knowledge is exclusively gained through observation and experimentation. Thus, inquiring data should be objective; researchers are not more than objective observers of the phenomena that exist independently of them. They should distance themselves from the investigated subject and not intervene.

From a methodological point of view, positivist researchers prefer quantitative methodological instruments for collecting data because of their ability to provide objective knowledge. Thus, positivist researchers rely heavily on experiments as the most valuable tools because they can deliver measurable results.

For their research design, positivists are based on a deductive approach, formulating a hypothesis or several hypotheses, and testing them while offering operational explanations, equations, calculations, and explorations to derive conclusions.

3.5.2. Interpretivism

Many thinkers have called into question the scope of positivism as a research paradigm, which is limited to natural science and hardly applicable to other fields. These severe problems have led Keith Richards to state that positivism is dead. It has become little more than a term of abuse." [17].

This situation led to interpretivism's birth, which emerged as a reaction to positivism. Contrary to the first research paradigm, this second one is more suitable for social science. Thus, it is a paradigm that is more focused on understanding and interpreting the meaning given by the social actors to the actions in which they are involved.

According to Max Weber, one of the interpretivism pioneers, the social world can only be understood by considering people's subjective meanings and purposes for their actions [18].

So, from an ontological point of view, interpretivism contrasts with positivism. Interpretative researchers believe that reality is not independent of the social actors' actions and perceptions. Reality is constructed by these people's experiences and subjective meanings. Therefore, this second paradigm rejects the existence of a single truth and the impossibility of its verification. Instead, it believes in the presence of multiple realities, socially constructed.

Interpretative research relies heavily on social actions, social actors' experiences, and subjective perceptions from an epistemological perspective. Thus, interpretative epistemology is subjective. Interpretative researchers must make part of the social reality and should not be dissociated from the studied subject. The researcher and the objects studied will thus be in interaction, and they will dialogue, question, hear, write notes, and finally record the research data.

From a methodological point of view, social reality can only be understood through the participatory understanding of the social actors' perceptions. Therefore, the interpretative research strategy is naturalist: the researcher uses data collected through interviews, questionnaires, and other instruments of descriptive data gathering.

3.5.3. Pragmatism

As defined in the literature, the paradigm works as a heuristic, conceptual and practical tool that helps solve our specific research problems [19]. It presents the beliefs regarding the nature of reality and knowledge and defines the researcher's worldview [20]. For example, the positivism paradigm focuses on precision, generalizability, reliability, and replicability of research results and claims that knowledge is based on objectivity, standardization, deductive reasoning, and firm control within the research steps [21].

As a reaction to positivism, the pragmatic paradigm believes that reality can never be determined once and for all [22], and it is more seen as what works rather than right. Hence, truth consists of what is good and useful over time": truth is whatever proves itself good or what has stood the scrutiny of individual users over time." [23]

So, the Pragmatic paradigm is a doctrine that denies the impossibility of achieving authentic knowledge concerning the absolute truth as was believed in the traditional

paradigms (such as positivism) with firm methodology. In this approach, we must use credible information taught to be appropriate to the practice's needs [24].

In contrast to the positivism paradigm, which believes in objective knowledge ensured through an inflexible methodology that consists of the examination of empirical evidence and the verification of the hypothesis, the pragmatic paradigm asserts that acquiring knowledge is a continuous process characterized by flexibility which enables the research to be situated somewhere between objectivity and subjectivity [25].

Accordingly, the researcher is free to decide about the research question's importance and the methodology's adequacy. Hence, the researcher's choice results from his beliefs, sociopolitical location, and personal history [26]. However, it is suggested that the researcher identifies a genuine problem that makes part of the social situation, defines them, and addresses an inquiry to address them [27].

So, pragmatic researchers focus on obtaining the necessary information to answer the research questions. The pragmatic approach seeks to create knowledge to understand some parts of reality through inquiries into the human situation change and improvement. This approach has stated that philosophical questions can never be answered because meaning is inseparable from human experience and needs [28].

A pragmatic approach seeks to solve human problems and find practical solutions [29] rather than to find the truth or the reality of the same questions that can provoke endless disputes. This paradigm enables the researcher to discover findings that matter using a non-firm methodology to understand the research problem and get practical solutions. Thus, the focus is on the research questions and the potential practical consequences rather than their stringency methods. In this case, the chosen strategy may adopt formal and informal rhetoric [30].

Therefore, according to this approach, there is no need for a firm methodology. Besides, whether the method consisted of a single or multiple methods is not crucial. Most importantly, the adopted tools produced the desired consequences [31]. The pragmatic vision aims to address the research question, investigate a phenomenon, or test a theory with Yvonne's most appropriate research method [32].

4. Results and Discussions

All the architecture departments and institutes where digital repositories are accessible were consulted concerning content analysis (Table 2). Doctoral theses about architecture, urbanism, and built environment were selected. Only five (5) of the total eighteen (18) departments and architecture institutes were chosen because of data availability and accessibility for the entire research community worldwide.

Table 2.   Algerian architecture departments and their doctoral thesis production

	All Architecture institutions in Algerian universities	doctoral thesis	Submissions date
01	Tlemcen architecture department	8	2016-2020
02	Mostaghanem architecture department	00	-
03	Oran architecture department	00	-
04	Polytechnic school of architecture and urbanism	Not accessible	1996-2018
05	Bejaia architecture department	00	-
06	Biskra architecture department	06	2013-2016
07	Laghouat architecture department	Not accessible	-
08	Bechar architecture department	Not accessible	-
09	Constantine architecture department	Not accessible	
10	Annaba architecture department	00	-
11	Batna architecture department	3	2019
12	Guelma architecture department	00	-
13	Blida architecture institute	Not accessible	-
14	Setif architecture institute	00	-
15	Oum el Bouaghi architecture department	02	2019-2022
16	Tebessa architecture department	00	-
17	Jijel department of architecture	2	2017-2018
18	Tizi ouzou department of architecture	00	-

Source: Authors

Table 3. Selected Departments and Topics

	All Architecture institutions in Algerian universities	General topics	Thesis number
01	Tlemcen architecture department	Heritage	06
		Urbanism	01
		Housing	01
02	Biskra architecture department	Housing	06
		Arid architecture	01
03	Batna architecture department	Urbanism	03
04	Oum el Bouaghi architecture department	Urbanism	01
05	Jijel department of architecture	Sustainable development	02

Source: Authors

Thus, from 1996 to 2022, the Algerian architecture departments and institutes produced 76 doctoral theses, from which 55 theses (more than 70 %) were submitted to the Polytechnic school of architecture and urbanism. Unfortunately, this content is not accessible through the school website. The same thing has been noticed in several other cases.

Research topics were then identified to concern all the aspects of the research's methodological issues regarding research paradigm identification and its proper application. All the submitted accessible theses from all the subfields from all the institutions are selected (Table 3).

According to this approach, many doctoral theses will be studied. The target population include either the most cited and the not cited doctoral theses submitted between 2013 and 2022 concerning the general topics of heritage conservation, urbanism issues, housing, the use of new technologies in architecture, the architecture of arid regions, and sustainable development issues (Table 4).

At this point, all the thesis content was read and deeply studied by the researcher to become familiarized with and to get an overview of key ideas and recurrent themes [33].

According to the content analysis approach, codes are predefined based on the literature review and the familiarization step (Table 5). As defined by Miles and Huberman [34], "Codes are tags or labels for assigning units of meaning…codes are usually attached to 'chunks' of varying size: words, phrases, sentences or whole paragraphs".

The codes can be reduced to one or two codes for each research paradigm. "Hypothesis" was selected in the case of positivist research as it is an essential keyword used by the positivist researcher. In the case of interpretative research works, "Questionnaires and interviews" should be the most used keywords. In the case of pragmatism, as it is a mixed-method approach, we can find, at the same time, positivist and interpretative codes. But as it is a reaction to positivism, we shouldn't see any of the positivist selected codes, especially the word "hypothesis".

According to the content analysis findings presented above, the central part of the most cited doctoral thesis elaborated in Algerian architectural departments does not follow research standards concerning identifying an appropriate research paradigm and respecting its logic and philosophical guidelines.

Table 4. Selected department and thesis topics

	Department		Selected Thesis title
		1A	Patrimonialization, method, applicability and impacts of the intervention on urban heritage The case of the historic city of Tlemcen [in French]
		1B	The multi-objective approach of optimization of the energetic and environmental performance of the habitat in Algeria by passive solar techniques-a step towards sustainability: Case study the collective buildings in Tlemcen [in French]
		1C	Study of the effect of urban morphology on the thermal comfort of outdoor spaces." Case study: The city of Tlemcen [in French]
		1D	Evolution of the public space in the housing estate the urban structure and mobility [in French]
1	Tlemcen	1E	The Contribution of Heritage to Local Development; Issues And Limits of Its Measurement Through the Revalorization of Buildings With Heritage Values in the Tlemcen Medina [in French]
		1F	Evolution of the defensive architecture of Tlemcen in the medieval period: techniques, materials and criteria of intervention. [in French]
		1G	Urban heritage between conservation and renewal genesis, mutation and sustainability of the landscape of the medina of Tlemcen [in French]
		1H	Enhancement and understanding of architectural heritage in Tlemcen by a contemporary interpretation: the case of the 3D restitution of the bath of Agadir [in French]
		1I	Promoting the image of a historical city for sustainable cultural tourism - case of the city of Tlemcen-.[in French]
		2A	The influence of climatic factors on the modification of the urban heat island in the street "canyon, dihedral and clear", Case of Biskra subdivisions [in French]
		2B	Collective social housing: Between design and use Case of the city of M'sila [in French]
		2C	A sustainable development by an ecotourism project Case of the ksour of the micro-region of Ziban. The recovery of an ecotourism circuit [in French]
2	Biskra	2D	the conformity of the individual housing of the allotments in the city of khenchela case of the allotment ennasr [in French]
		2E	Spatial specificities and social logic of a new type of domestic habitat in eastern Hodna The type "Diar Charpenti [in French]
		2F	Domestic architecture in the making Forms, use, and representation: The case of Biskra [in French]
		3A	Attempts to reappropriate outdoor spaces in multi-family housing estates [in French]
		3B	Balance in the urban network, and trends of urbanization in the Ziban region. [in Arabic]
3	Batna	3C	The variation of density and scale of housing in the structuring of the urban landscape [in French]
		3D	Towards a new development policy for eco-neighborhoods making the city differently [in French]
		3E	The urban atmosphere in Algiers how to offer a public space of quality of life, case of the safeguarded sector [in French]
		4A	Improvement of urban microclimates through the proliferation of green roofs and terraces in arid and Mediterranean areas [in French]
4	Jijel	4B	Development and application of a method for assessing the environmental impacts of tourism buildings by life cycle analysis [in French]

Source: Authors

Table 5. Generated codes for each research paradigm

Themes	Positivism	Interpretivism	Pragmatism
Sub key themes	P1(Positivism, positivist approach, positivist paradigm), P2 hypothesis (test, verification, validation, invalidation of hypothesis) P3 experimentation, P4 observation, P5(quantitative, quantitative approach), P6 objectivity, P7 generalizability, P8(variables, variable manipulation), P9 cause-effect relation, P10 statistical analysis P11 Deduction	I1(Interpretivism, interpretative approach, interpretative paradigm), I2 Naturalistic approach I3 questionnaire, I4 interviews, I5 qualitative method, I6 sampling I7 Induction	Pr1(pragmatic approach), Pr2mixed method, Pr3practice-oriented research problem, Pr4problem centered approach Pr5 Abduction

Source: Authors

Table 6. Content analysis findings

Thesis	Frequency of "Hypothesis" words (Positivism)	Frequency of "Interviews" and "questionnaires" words (interpretivism)	Pragmatic Paradigm
1A	50	00	-
1B	12	6	-
1C	7	39	-
1D	3	0	-
1E	28	0	-
1F	18	0	-
1G	47	00	-
1H	111	17	-
1I	3	9	-
2A	2	0	-
2B	11	169	-
2C	8	0	-
2D	14	11	-
2E	44	9	-
2F	56	62	-
3A	04	30	-
3B	13	00	-
3C	40	1	-
3D	11	35	-
3E	7	35	-
4A	01	01	-
4B	09	11	-

Source: Authors

First of all, in the ensemble of the analyzed thesis, there was no mention of the word paradigm, which brings us to question whether the researchers found no use of the research paradigm identification or they are unaware of the necessity of understanding and correctly applying the adequate paradigm principles. According to this research, the second possibility seems most acceptable; In the majority of the analyzed thesis, the researchers used, at the same time, keywords belonging to two-antagonist research paradigms (Table 6): Positivism (hypothesis) and interpretivism (questionnaires and interviews), which cannot be acceptable in scientific research. The ontological

and epistemological differences between positivism and interpretivism are huge. They cannot be implemented in the same research. We are not talking about methodology, which can be combined (mixed method) according to the third paradigm, pragmatism, which was not the case in all the selected theses (Table 6).

Also, according to the content analysis findings, the major part of the selected thesis used the word hypothesis (Table 6), which was indicated, within this study, to be the main feature of positivist research. In this regard, we had a clear idea concerning the erratic use of positivism as a research paradigm in architecture and built environment and, more importantly, in the studied topics. Here we should mention that, intentionally or unintentionally, none of the selected theses, despite citing the concept of verification and test of hypothesis, has ensured the proper verification within a purely objective process according to the positivist philosophy. Verifying a hypothesis and the validity of research within a positivist paradigm is based on the exclusive use of empirical data generated through experiments or tests to confirm or disprove a hypothesis rationally. Whereas in most qualitative research, hypothesis verification should not be mentioned. According to interpretivism, the researcher describes and examines the reality concerning a topic instead of proving or disproving something. According to the interpretivism paradigm, reality should emerge from the data generated through naturalistic research methods (induction), not the inverse (deduction).

5. Conclusions

The architecture and built environment research in Algerian universities do not give importance to identifying and designing the paradigmatic reflection, which is of capital importance. That should help guide the research by controlling its evolution, relevance, and coherence. Above all, paradigmatic positioning allows the establishment of research validity and legitimacy.

This research was based on documentary research. Readings on paradigms of research types and their philosophical principles were done as well as their applicability to architecture, urbanism, and the built environment field.

To understand the failure or success of methodological approaches in the Algerian case, the research was also based on content analysis of several doctoral theses submitted in different architecture departments in Algeria. The content analysis will focus on identifying the research paradigm, whether it was determined, and if its ontological, epistemological, and methodological visions were correctly applied.

The research findings showed that the major part of the selected doctoral thesis prepared in Algerian architectural departments does not follow research standards concerning

identifying an appropriate research paradigm and respecting its logic and philosophical guidelines.

In architecture and built environment discipline, pragmatic positioning is crucial because it provides beliefs and dictates what should be studied, how it should be achieved, and how research data should be analyzed and interpreted. In the case of Algeria, university standards are not clear about that; research approaches, such as qualitative and quantitative approaches, are more discussed than their philosophical foundation and adequacy to the research topic. The research paradigm consisted of a beliefs model that frames the perception of a research community within a peculiar subject. This researcher's beliefs model adequately answers ontological, epistemological, and methodological issues.

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