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Investigative competencies of university lecturers and quality of academic training

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Abstract: This article analyzes, from a theoretical-analytical perspective, the relationship between the investigative competencies of university lecturers and the quality of academic training in higher education, focusing on research developed for the eighth and ninth terms at the Universidad Estatal de Bolívar. Four dimensions of the faculty research profile are integrated—methodological mastery, scientific production, research mentorship, and the integration of research into teaching—alongside four dimensions of educational quality—academic rigor, development of student scientific competencies, relevance of mentorship, and quality of academic outputs. Drawing from recent literature and the Ecuadorian regulatory framework, a conceptual model is proposed to explain how research can function as a pedagogical mediation. The article does not attribute empirical results to the institution, as instrument application represents a subsequent phase; its contribution lies in establishing a robust conceptual framework for quantitative verification and for the design of institutional strategies aimed at strengthening research capabilities.

Keywords: Investigative competencies; educational quality; university teaching; formative research; higher education

Introduction

Contemporary higher education requires teaching to transcend the passive transmission of content and evolve into a practice capable of articulating disciplinary knowledge, research, critical thinking, and academic mentorship. This requirement becomes particularly critical during the final terms of a degree program, when students must demonstrate intellectual autonomy, argumentative skills, methodological mastery, and the ability to produce complex degree projects or academic outputs. Within this context, the research competencies of university faculty acquire a strategic role, directly influencing the quality of guidance, the selection of evidence, problem formulation, and the feedback provided to students. The foundational research posits that teacher research competencies represent neither an isolated trait nor an equivalent to merely publishing papers. Rather, they constitute an integrated set of knowledge, analytical skills, methodological criteria, communication abilities, and ethical dispositions that enable educators to understand problems, formulate questions, design research pathways, analyze data, and mentor others in knowledge construction. This conceptualization aligns with [11,3, 9, 13] who emphasize the multidimensional nature of research competence. In the Ecuadorian context, the link between teaching, research, and quality is further supported by a legal and institutional framework. The Constitution of the Republic, the Organic Law of Higher Education (LOES), and internal university regulations recognize research as a core institutional function. Consequently, evaluating teacher research competencies is not solely an issue of scientific productivity; it involves examining a fundamental condition that impacts the learning experience, the development of critical thinking, and the overall quality of student academic outputs. The objective

of this article is to expand a conceptual framework explaining the relationship between faculty research competencies and the quality of academic training. It preserves the variable structure proposed in the underlying thesis while explicitly distinguishing theoretical inferences from empirical findings yet to be collected. This distinction is vital because the original design is non-experimental and cross-sectional: it will be capable of estimating associations, but cannot establish causality in an experimental sense.

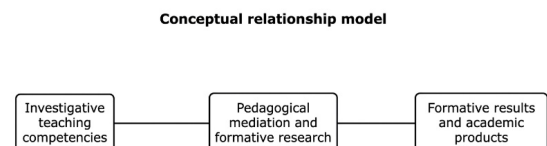


Figure 1. Conceptual model of the relationship between investigative competencies, pedagogical mediation, and educational quality

2. Investigative competencies of university faculty

Investigative competencies represent a professional construct that integrates methodological knowledge with the ability to apply it in context. An educator may possess knowledge of research techniques yet still face limitations when guiding students if they fail to translate that knowledge into clear pedagogical decisions. For this reason, recent literature proposes frameworks that articulate knowledge, procedures, attitudes, critical capacity, and research experience. Competence manifests both in self-directed production and in the way the instructor organizes inquiry activities, provides feedback on academic writing, and guides methodological choices. Methodological mastery encompasses problem formulation, design selection, instrument application, data analysis, and result interpretation. It is not equivalent to memorizing definitions of methods; rather, it requires understanding the core logic connecting the research question, objective, evidence, and procedure. In university instruction, this dimension is particularly relevant because students often directly transfer the methodological decisions suggested by the lecturer to their own projects and degree theses. Scientific production constitutes another central dimension. Publishing papers, participating in research projects, presenting at conferences, and disseminating findings promote disciplinary updating and expose faculty to real-world scientific communication standards. However, the underlying thesis rightly avoids reducing all research competence solely to this dimension: a scientifically productive lecturer does not necessarily possess tutoring skills, and an effective tutor may require institutional support to increase their publication output. Research mentorship includes methodological advising, monitoring progress, providing scientific feedback, and offering degree completion support. Its pedagogical value lies in transforming research into a gradual learning process. Timely feedback enables students to identify inconsistencies before they solidify, re-examine assumptions, refine arguments, and understand why specific methodological choices are more appropriate than others. The research-teaching integration completes the model. This dimension incorporates formative research, critical thinking, classroom inquiry activities, and the articulation between theory and practice. Its purpose is to prevent research from appearing exclusively at the end of the degree program as a graduation requirement. When the curriculum embeds progressive experiences of searching, critical reading, data analysis, question formulation, and academic writing, students reach their final terms with greater methodological familiarity and reduced tutorial dependence.

Table 1. Core dimensions of the faculty research profile

Dimension	Core Indicators	Contribution to Teaching
Methodological Mastery	Problems, methods, instruments, analysis, and interpretation	Provides coherence and rigor to research decisions.
Scientific Production	Articles, projects, conference presentations, dissemination	Updates knowledge and connects teaching with scientific communities.
Research Mentorship	Advising, monitoring progress, feedback, degree completion support	Fosters progression, autonomy, and improvement of the academic output.
Research-Teaching Integration	Formative research, critical thinking, theory-practice linkage	Transforms inquiry into a daily learning strategy.



Figure 2. Cycle of capabilities composing faculty research performance

Quality of academic training as a multidimensional construct. Quality of higher education training cannot be reduced to administrative indicators, pass rates, or compliance with accreditation processes. In the analyzed research, quality is understood as a formative condition expressed through depth of learning, academic rigor, analytical capacity, relevance of mentorship, and the soundness of student-constructed outputs. This perspective aligns with systemic and continuous improvement approaches by recognizing that educational outcomes emerge from the interaction among curriculum, teaching practices, research, resources, and institutional culture. Academic rigor refers to intellectual demand, conceptual depth, coherence of the training process, and analytical capacity. Rigorous training does not imply an accumulation of assignments, but rather the presence of clear quality criteria, consistent argumentative standards, and opportunities to correct errors. Rigor becomes visible when students can justify choices, distinguish evidence from opinion, and support their assertions with relevant literature. The development of student research competencies represents a second dimension. It includes problem formulation, literature searching, argumentation, methodological application, and interpretation of findings. This dimension makes it possible to observe educational quality through concrete performances rather than relying exclusively on general perceptions of teaching. The relevance of faculty mentorship incorporates clarity of orientation, progress monitoring, availability, feedback, and research support. In advanced terms, this dimension proves critical because students encounter open-ended problems and non-routine decisions. Relevant mentorship does not replace autonomy; instead, it provides criteria so that students learn to make better-founded decisions. Finally, the quality of academic outputs can be analyzed through argumentative coherence, methodological rigor, use of scientific sources, analytical capacity, and overall soundness. This dimension offers a particularly valuable opportunity to complement survey perceptions with documentary review, strengthening the study's interpretive validity.

Table 2. Core dimensions and evidence of educational quality

Quality Dimension	Observable Manifestations	Possible Evidence
Academic Rigor	Depth, intellectual demand, coherence, analysis	Survey and academic performance.
Student Scientific Competencies	Problem formulation, sources, argumentation, method, interpretation	Survey and academic outputs.
Relevance of Mentorship	Clarity, progress monitoring, availability, feedback	Student survey.
Quality of Academic Outputs	Coherence, method, sources, analysis, and soundness	Documentary review sheet.

Mechanisms of relationship between variables The theoretical hypothesis linking both variables can be explained through a mechanism of pedagogical mediation. A professor's research knowledge does not improve academic training on its own; it must be converted into instructional decisions, intellectually demanding tasks, feedback, and opportunities for participation in authentic inquiry processes. In other words, the independent variable generates potential educational effects when translated into learning experiences. Methodological mastery can influence educational quality by enhancing the coherence with which research processes are taught. Scientific production can contribute through content updates, exposure to contemporary debates, and the modeling of academic communication practices. Mentorship can impact output quality by reducing errors, strengthening decision-making, and fostering progressive autonomy. The research-teaching integration can act cross-cuttingly, creating a culture of inquiry that precedes the final degree project. These mechanisms should not be interpreted as linear or automatic relationships. Educational quality also depends on resources, teaching load, curricular design, student motivation, database access, institutional research time, and organizational culture. Therefore, the proposed model must be understood as an analytical framework identifying plausible and measurable relationships, rather than a closed causal explanation. The utility of this model lies in enabling dimensional analysis. Rather than limiting the study to an overall correlation between two composite scores, specific associations can be examined—for example, between research mentorship and output quality, between research-teaching integration and student scientific competencies, or between faculty scientific production and perceived academic rigor. This level of granularity can generate more precise institutional recommendations.

Table 3. Interaction mechanisms and evaluation indicators.

Specific Relationship	Expected Mechanism	Contrast Indicator
Methodological Mastery → Academic Rigor	Greater coherence in teaching methodological decisions	Dimension scores and perceived level of demand.
Mentorship → Quality of Outputs	Feedback and monitoring reduce inconsistencies	Documentary rubric and survey.
Research-Teaching Integration → Student Competencies	Frequent practice of inquiry develops autonomy	Formative research items and performance.
Scientific Production → Formative Updating	Exposure to recent research updates content	Evidence of production and student perception.

Ecuadorian normative and institutional context The Ecuadorian framework provides direct support to this analysis. The Constitution of the Republic establishes that higher education must integrate scientific training, research, and innovation. The Organic Law of Higher Education (LOES) links the principle of quality with continuous improvement and recognizes teaching, research, and community engagement as articulated core functions. Consequently, faculty research training does not constitute a peripheral activity, but an essential component of the academic role. This normative framework is particularly relevant because it allows faculty research competencies to be interpreted as both an individual capability and an institutional responsibility. Universities must establish conditions for continuous professional development, participation in projects, resource availability, recognition of scientific output, and mentorship of students. An exclusively individual reading of the issue would be insufficient, as performance largely depends on organizational opportunities and structures. For the State University of Bolívar (Universidad Estatal de Bolívar), this study gains added value by focusing on the eighth and ninth academic terms—stages inherently linked to knowledge integration and thesis completion. The analysis can serve as empirical evidence to guide training programs, communities of practice, mentorship systems, scientific writing support, and strategies for aligning institutional research projects with classroom instruction. Implications for academic management The first implication consists of differentiating methodological training from the comprehensive development of research competencies. Faculty development programs should combine updates in research methods with scientific writing, data analysis, ethics, peer review, mentorship, and formative research strategies. Competence is not strengthened through isolated workshops, but through continuous trajectories of practice, accompaniment, and evaluation. A second implication is the need to bridge scientific production with teaching. Institutional research projects can generate case studies, datasets, real-world problems, and empirical evidence to enrich classroom activities. Similarly, high-quality student outputs can be transformed into research incubators (*semilleros*), posters, conference presentations, or manuscripts, provided clear ethical and authorship guidelines are established. A third implication pertains to academic evaluation. If the university aims to strengthen the research profile of its faculty, it should avoid relying exclusively on quantitative publication

metrics. It is necessary to evaluate the quality of mentorship, the integration of research into the curriculum, student participation, the use of evidence, and contributions to scientific training. The proposed dimensional model offers an initial framework to build a balanced tracking and evaluation system.

Discussion

The reviewed literature converges in highlighting that research competencies are relevant to faculty professional development and student scientific training. However, the precise relationship between both dimensions must be examined within each specific context. The cited studies demonstrate that significant differences can exist among methodological mastery, dissemination capacity, project participation, and mentorship skills. This heterogeneity justifies evaluating these dimensions independently. The main conceptual contribution of this article lies in positioning pedagogical mediation as the key link between research competence and educational quality. This perspective overcomes two reductions: assuming that conducting research automatically improves teaching performance or considering research irrelevant to student learning. The model sustains an intermediate position: research competence generates educational value when converted into strategies, standards, feedback, and opportunities for inquiry. The primary limitation of this study is the absence of original empirical results in the baseline thesis. Consequently, this article does not claim that the relationship has been proven at the State University of Bolívar (*Universidad Estatal de Bolívar*). The quantitative phase must validate the instrument, determine reliability, describe the sample, and estimate associations using Spearman's Rho. Only after that phase will it be possible to test the institutional hypothesis.

Conclusions

The research competencies of university faculty can be conceptualized as a multidimensional capability integrating methodological mastery, scientific production, mentorship, and formative research. This structure allows for observing both the scientific performance of teaching staff and their ability to transform research into a pedagogical experience. The quality of academic training also possesses a multidimensional nature and can be analyzed through rigor, student scientific competencies, the relevance of mentorship, and the quality of academic outputs. The relationship between both constructs is explained more consistently when pedagogical mediation is incorporated and contextual institutional factors are recognized. The proposed model provides a useful foundation for the empirical phase and institutional decision-making. Its future application should maintain cautious correlational language, complement perceptions with documentary evidence, and avoid attributing causality within a non-experimental, cross-sectional design.

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