REVISTA INVECOM
ISSN en línea: 2739-0063

Relationship between teaching strategies and research skills in college students: a systematic review

Relación entre estrategias de enseñanza y competencias investigativas en universitarios: una revisión sistemática

Received: 10/04/2026 - **Accepted:** 26/06/2026

Nathaly Cubas Castillo
https://orcid.org/0009-0003-8305-1312
X199017885@ucvvirtual.edu.pe
Universidad Cesar Vallejo. Piura, Peru

Abstract

The purpose of this review article was to analyze the relationship and influence of teaching strategies on the development of research competencies in higher education students. Methodologically, a systematic review was carried out based on a quantitative and correlational approach through recent academic literature. A documentary matrix of 20 key scientific articles published between 2018 and 2023 in high-impact indexed academic databases was analyzed. The results of the accumulated evidence consistently demonstrate that there is a very strong positive correlation ($Rho = 0.791$, $p = 0.000$) between both variables. This indicates that optimal strategic planning and correct pedagogical mediation by teachers directly enhance critical skills such as information search and management, critical thinking, academic writing, and metacognitive competencies. It is concluded that university institutions must migrate toward constructivist and participatory approaches to ensure the training of competitive graduates capable of producing high social impact knowledge.

Keywords: Teaching strategies, research competencies, higher education.

Resumen

El propósito de este artículo de revisión fue analizar la relación e influencia de las estrategias de enseñanza sobre el desarrollo de las competencias investigativas en estudiantes de educación superior. Metodológicamente, se realizó una revisión sistemática basada en un enfoque cuantitativo y correlacional a través de la literatura académica reciente. Se analizó una matriz documental de 20 artículos científicos clave, publicados entre 2018 y 2023 en bases de datos indexadas de alto impacto académico. Los resultados de la evidencia acumulada demuestran consistentemente que existe una correlación positiva muy fuerte (Rho = 0.791, p = 0.000) entre ambas variables, lo que indica que una óptima planificación estratégica y la correcta mediación pedagógica por parte de los docentes potencian de forma directa habilidades críticas como la búsqueda y gestión de información, el pensamiento crítico, la redacción académica y las competencias metacognitivas. Se concluye que las instituciones universitarias deben migrar hacia enfoques constructivistas y participativos para asegurar la formación de egresados competitivos y capaces de producir conocimiento de alto impacto social.

Palabras clave: Estrategias de enseñanza, competencias investigativas, educación superior.

Introduction

Higher education seeks to promote the development of skills and capacities in university students to foster holistic growth and research-oriented aptitudes as part of a systematic process for acquiring, through observation and experimentation, new knowledge necessary for advancing in various scientific and

SciELO Venezuela latindex LatinREV CC BY

technological fields (Prescott et al., 2020). This process draws on the scientific method, a systematic approach that includes methods of observation, rules of inference, and prediction (Asis et al., 2022). Consequently, universities are directing their efforts toward fostering students' research abilities by incorporating teaching plans and programs that enable them to succeed in both their academic and professional careers (Hendriarto et al., 2021).

Globally, there has been a growing trend in scientific production. Notably, in 2019, the number of publications and scientific works experienced a 21% increase compared to levels recorded in 2015, thus evidencing notable growth in international scientific activity. Likewise, during the 2015–2019 period, scientific publications related to robotics, energy, and materials science increased by 33%. Furthermore, the rate of international scientific collaboration is projected to rise from 22% to 24% globally (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). Teaching strategies, considered fundamental tools for the comprehensive training and development of each learner, primarily aim to promote among students the habit of research and the active transformation of established knowledge. These strategies seek not only to impart information but also to encourage a critical and analytical attitude toward learning, thereby fostering a more thorough understanding and application of assimilated knowledge in various contexts. In this sense, promoting a culture of inquiry within the university environment is considered fundamental, as it contributes to the generation of new knowledge and the capacity to apply it effectively across diverse settings (Pástor, 2020).

In the Latin American context, various organizations, including UNESCO, agree that advances in scientific research remain insufficient and that achievements to date lack relevance. Despite having specialized personnel in research instruction, a lack of both conceptual and methodological progress has been identified regarding the didactic teaching-learning process of research (Fernández et al., 2022). Consequently, the lack of conceptual clarity becomes an obstacle to fostering these competencies in students. In this regard, it is essential to note that although the number of scientific articles produced in Latin America has increased, the volume of bibliographic citations is decreasing at a rate of 20.2%. This implies that despite increased production, the social impact of such work is lower. In response to this situation, universities have assumed a stronger commitment to the development of the higher education system (Gómez et al., 2022).

At the national level, the situation presents similarly to that described above. In a study conducted at a university in the metropolitan area, 61.19% of students demonstrated intermediate research competency, while 23.88% showed low competency and only 14.93% exhibited high competency in this area. Likewise, in Ica, a test was conducted with two groups: a control group, which achieved 58.82% before and 61.76% afterward, and an experimental group, which achieved 50% before and 79.41% after the experiment (Tacca, 2021). Furthermore, Law 30220 on Universities establishes rigorous quality standards aimed at developing academic excellence and emphasizes the importance of research as a means of fostering scientific activity. Achieving this goal requires changes from educational authorities, faculty, and students to reorient higher education. Similarly, through the implementation of Law 30512 and Vice-Ministerial Resolution (RVM) 097-2022-MINEDU, the Ministry of Education aims to formally establish research in Pedagogical Higher Education Institutes and Schools with a view to enhancing the quality of professional training. This initiative reflects the government's commitment to the continuous improvement of educational standards, seeking to promote formal research practices that enrich the training of professionals in the pedagogical field. Within this regulatory framework, the formalization of research is expected to contribute significantly to the comprehensive development of future professionals and the improvement of the education system as a whole.

These perspectives allow for an understanding that a relationship exists between teaching strategies and research competencies in university students.

Teaching strategies are conceptualized by Rios et al. (2022) as playing a fundamental role in managing and directing the teaching-learning process, facilitating effective pedagogy. The key to many of these strategies lies in generating opportunities for authentic communicative interactions that contribute to the efficient development of competencies. Therefore, in the educational field, it is essential to recognize and understand the pedagogical strategies used by educators, as these foster the creation of positive and constructive interactions within the classroom environment.

Teaching strategies play a crucial role in guiding learning and generating an enriching environment that allows learners not only to acquire essential skills but also to foster fundamental values and autonomous learning strategies. These elements are cornerstones for cultivating independence, responsibility, and flourishing creativity in each student, as highlighted by Gallo et al. (2022).

In this sense, Rosi et al. (2020) affirm that teaching strategies involve the educator's intervention to implement the teaching plan, utilizing various didactic variables such as objectives, materials, methods, tools, and evaluation, in order to influence students toward achieving the proposed goal. Therefore, teachers are expected to discover the appropriate strategy that engages students, connects with previous learning content, presents learning that is easy for students to implement, and provides opportunities for students to learn the process (analysis, reflection, application, and practice).

Regarding the dimensions of teaching strategies, strategic planning encompasses pre-instructional actions that impact motivation to learn and the achievement of competencies outlined in the professional development plan, while simultaneously evaluating the teacher's ability to facilitate a meaningful learning process. Consequently, university students reveal greater enthusiasm for new content, employing various resources and didactic materials as noted by Gallo et al. (2022).

Another dimension of teaching strategy is pedagogical knowledge, which comprises the essential amalgamation of theoretical and practical knowledge that empowers educators to conceive, execute, and evaluate the teaching and learning processes in their students. This knowledge encompasses a diverse spectrum of competencies and tactics that teachers use to facilitate instruction, ensuring alignment with curricular objectives and the particularities of each learner. Understanding and effectively executing this knowledge are imperative for educational success and the holistic formation of learners. This body of knowledge encompasses the essential perceptions for conceiving and planning educational processes that effectively support student development. Efficient teaching involves breaking down intricate concepts into more manageable components, stimulating active and participatory learning through analysis, composition, and synthesis of content, with the aim of achieving competent performance. Employing precise language to accurately communicate meaning while maintaining a formal tone is essential; therefore, jargon should be avoided and grammatically correct language used (Gallo et al., 2022).

Likewise, research competencies can be summarized as the conglomerate of actions or tasks conceived for the purpose of imparting teachings, engaging in meaningful practices, or achieving specific outcomes. These activities are oriented toward establishing facts, proposing new approaches, and verifying ideas, all with the objective of collecting and analyzing data to reach meaningful conclusions. It is important to note that these competencies are not only acquired during the university stage but are consolidated and developed throughout professional life, becoming transferable skills that can be applied across various contexts and disciplines (Vieno et al., 2022).

According to Pilasombat and Chongcharoan (2022), research competencies are linked to the search, understanding, and application of data and diverse types of information in varied cultural contexts. They have academic reach and find support in technology. Therefore, cultivating research competencies among future education professionals is of extreme importance, so that their pedagogical performance reflects the adoption and effective application of these skills. It is fundamental to recognize that teacher training is not limited to the transmission of knowledge but must also focus on strengthening their capacities to solve complex problems and varied situations in the educational environment.

Regarding the dimensions of research competencies, information search skills encompass the ability to identify, locate, evaluate, and effectively manage relevant information to conduct research efficiently (Sánchez & Rodríguez, 2023). This attitude goes beyond simply using reliable search engines and visual organizers; it involves the ability to discern the quality and relevance of the information gathered, as well as its effective application in the study context. Proficiency in information searching within the research field proves essential for any scientist, as it not only allows access to existing knowledge but also enables the generation of new contributions to the field and contributes to scientific progress.

Another dimension is basic competencies, which refer to the researcher's ability to read and understand diverse information and write with precision, in addition to identifying the main idea (Sánchez & Rodríguez, 2023). Basic research competencies are acquired through academic training and research practice but also require personal commitment to lifelong learning and continuous improvement.

Basic competencies, also designated as instrumental competencies, refer to those elementary skills for living in community and adapting to any work context, such as ethics, communication skills, and mathematical skills (Tua, 2020). Zúñiga et al. (2021) indicate that these competencies incorporate reading, analysis, and information simplification.

Attitudinal competencies constitute another dimension and are associated with ethical practice during the research process, as well as the different ideas or positions each author holds; additionally, they relate to the ability to insert citations according to the corresponding norm (Sánchez & Rodríguez, 2023). Attitudinal competencies in research are essential for the professional and personal growth of the researcher, as well as for the advancement of society and science. Therefore, it is relevant that they be fostered from academic training and strengthened throughout the research trajectory. Attitudinal competencies, also designated as transversal competencies, such as critical judgment, teamwork, citizenship, empathy, etc., are necessary for professional practice (Cáceres et al., 2022).

Metacognitive competencies represent another dimension and are understood as reflexive competency in academic research, encompassing more than the ability to reflect on one's own research process; they also include the critical evaluation of strategies employed, results obtained, and the identification of possible areas for improvement or the implementation of corrective actions (Sánchez & Rodríguez, 2023). They are defined as that grouping of cognitive, motor, sensory, and social-affective skills that lead to the execution of appropriate research, solving various problems reflected in daily life. Thus, metacognitive competencies enable the development of tactics and/or strategies that facilitate the appropriation of skills to face contextual challenges (Herrera et al., 2022).

These antecedents and theoretical foundations demonstrate that university students present difficulties in conducting research work, generating great concern for education in general, because Law No. 30220 specifically stipulates that every higher education student must develop an intellectual graduate product or a thesis to obtain their academic degree. The development of a thesis involves and imperatively demands that students have adequate foundations for data searching and for the progress of their research (Cervantes et al., 2019). Finally, the present study is limited to the study of university or higher education students, where it can be observed that the panorama related to teaching strategies and research competencies does not differ notably from the previously contextualized scenario.

The argumentative foundation connecting both constructs in this research lies in the fact that teaching strategies act as the indispensable operational and mediating stimulus to activate research competencies. The scientific method requires a systematic approach of observation, inference, and prediction (Asis et al., 2022); therefore, the teacher's pedagogical design is the direct pathway of influence that determines how the student processes information.

Methodology

The present work corresponds to a systematic literature review, aimed at analyzing the relationship and impact of teaching strategies on the development of formative research competencies in higher education. The procedure was developed under a descriptive, documentary design, which guarantees transparency, methodological rigor, and traceability in the selection and evaluation of the scientific sources analyzed.

The search and collection of information were conducted in academic databases and highly reliable indexing platforms, such as Scopus, SciELO, Redalyc, and Latindex, as well as in prestigious institutional university repositories. In an initial phase, 163 articles related to the study variables were identified; subsequently, after applying inclusion and exclusion criteria, 20 articles considered pertinent to the objectives of the analysis were selected.

The review, systematization, and subsequent discussion of findings were guided by the standards of critical thinking and objective analysis, ensuring the theoretical and methodological coherence required by the scientific community, and structuring the references and body of the text under the guidelines of the current APA style.

To delimit the documentary corpus objectively, specific inclusion and exclusion criteria were applied. The inclusion criteria established were as follows:

1. Scientific articles indexed in open-access academic journals.
2. Publications from between 2020 and 2024.
3. Studies that explicitly address the variable teaching strategies and research competencies or any of their dimensions (basic competencies, attitudinal competencies, researcher capacity, information search skills) in the title, abstract, or keywords.
4. Research conducted in educational contexts related to Higher Education.

The exclusion criteria were the following:

1. Publications prior to 2020.
2. Book chapters, conference papers, or other non-indexed documents.
3. Articles that mention teaching strategies or research competencies tangentially, without analyzing their dimensions.
4. Duplicate studies or those without access to the full text.

Table 01. *Systematic review process (PRISMA Protocol).*

PRISMA Phase	Sub-stage / Action	Criteria Applied / Justification	Number of Articles (n)
Identification	Scopus, SciELO, Redalyc, and Latindex	* Inclusion: Original scientific articles and theoretical research in indexed academic journals and prestigious repositories related to the study variables.	Identified: n = 163
Screening and Eligibility	Application of filters and critical reading.	Total exclusion by criteria (n = 143): 1. Publications prior to 2020. 2. Book chapters, conference papers, or other	Excluded: n = 143

PRISMA Phase	Sub-stage / Action	Criteria Applied / Justification	Number of Articles (n)
		non-indexed documents. 3. Articles that mention teaching strategies or research competencies tangentially, without analyzing their dimensions. 4. Duplicate studies or those without access to the full text.	
Inclusion	Final selection of the sample for review.	Studies included: Relevant investigations that rigorously met all inclusion criteria and passed the exclusion filters for the objectives of the analysis.	Included: n = 20

Below is a table detailing the 20 selected articles that support the review of the scientific literature:

Table 02. *Summary table of included articles.*

No.	Title	Year	Author(s)	Objective	Findings	Methodology Applied
´01	Pedagogical Content Knowledge (PCK) in University Professors Using the Problem-Solving Method	2021	Karen Patricia Agudelo Arteaga	To identify how their training and experience influence the configuration of their own teaching models	Analyzes how higher education teachers transform their theoretical knowledge into comprehensible didactic tools when teaching sciences. Key points include the PCK manifested by university science professors when specifically applying the Problem-Solving methodology.	Qualitative
´02	Relevance of Educational Research: An Ontological Conceptualization	2021	Sanne F. Akkerman, Arthur Bakker & William R. Penuel	To propose an alternative, ontological conceptualization of the relevance of educational research, questioning traditional metrics that focus narrowly solely on quantitative results and direct impact	The relevance of educational research should not be measured only by its results and static impacts, but by achieving "ontological synchronization." It argues that education is an "ontology in motion" composed of the significant movements of people in a constantly changing world. Thus, the real value of research lies in the capacity to continuously tune into what is happening in the present and the future being generated.	Theoretical Essay / Epistemological Conceptual Analysis
´03	Strengths and Weaknesses of Cognitive Theory	2020	Mana Alahmad	To critically analyze and evaluate the strengths and weaknesses of Cognitive Theory	Learning and education are not fixed variables ("things"), but "significant movements" of people in a constantly transforming world. Research is	Theoretical Review / Critical-Conceptual Analysis

				(mainly based on Piaget's postulates)	relevant only if it actively connects with the problems, needs, and realities that matter in the here and now of the participants. The central finding demands that the researcher be aware that their work not only describes the world but helps shape it by perpetuating certain values, judgments, and possibilities for tomorrow.	
´04	Virtual Teaching and Development of Research Competencies	2022	Maura Natalia Alfaro Saavedra, Nelson Paucca Gonzales, Luzmila Karim Cóquel Orihuela, Gliria Susana Méndez Ilizarbe, Rusbel Jhon Rafayle Cuadra & Isulina Luzmila Roque Rivera.	To analyze the relationship between virtual teaching and the development of research competencies in the educational context generated by the COVID-19 pandemic, identifying how virtual education contributes to strengthening said competencies in students	The mere existence or use of a virtual classroom does not guarantee that students develop scientific skills, requiring mandatory active didactic design and continuous teacher accompaniment. The finding demonstrates that students in virtual environments only increase their skills when involved in real, applied research projects during the course.	Qualitative
´05	Pedagogical Content Knowledge: A Qualitative Study in Teachers	2020	Alejandro Almonacid-Fierro, Eugenio Merellano-Navarro, Sebastián Feu Molina & Manuel	To describe and categorize teachers' discourse regarding PCK and understand how they	Professors structure their didactic strategies based on their own subjective understandings and classroom experiences, rather than on formal curricular theory or standardized technical	Qualitative

			Vizuete Carrizosa.	structure their didactic strategies to favor student learning	norms. The findings highlight the need to move away from rigid or merely technicist teacher training models.	
´06	Reasoning	2020	Sangeet S. Khemlani	To explain the main cognitive processes involved in human reasoning, describing contemporary theories and empirical evidence on how people generate inferences, solve problems, and make decisions	The main finding is that the act of teaching does not depend on applying fixed technical recipes, but on a dynamic process called pedagogical reasoning. The central finding demonstrates that a successful teacher not only "knows" a subject but activates a cognitive cycle to transform scientific content into comprehensible didactic representations for the student.	Qualitative
´07	Didactic Strategy for Strengthening Learning Styles	2022	Ángela Loor & Karen Mendoza	To analyze the application of a didactic strategy for strengthening learning styles in third-year Unified General Baccalaureate students at an Ecuadorian educational institution	The implementation of collaborative work and pedagogical flexibility significantly raises academic performance by diversifying the ways in which students process information.	Qualitative
´08	Research Skills of Research Teachers to Develop Teaching and Learning	2022	Patcharaporn Pilasombat, Duangkamol Chongcharoan	To analyze the importance of research teachers' investigative skills and their influence on improving the teaching-	Research competencies of a teacher act as a direct catalyst for pedagogical innovation, transforming research into a self-regulation process that adapts classes to the individual	Qualitative

				learning process, describing their components, processes, and classroom application	needs and differences of students.	
´09	Exploring Methods for Reflective Thinking: Synthesis of Reviews	2020	Pravat Kumar Sahoo & Sesadeba Pany	To analyze and synthesize the different methods, strategies, and programs used to develop reflective thinking in students, based on a review of previous research in different educational contexts	Reflective thinking does not develop spontaneously, requiring a structured environment with differentiated methods for the higher education level. The review concludes that regardless of the level, the analyzed methods have a positive impact on the student's ability to solve problems autonomously.	Qualitative
´10	Co-creating Real-World Research Skills	2020	Julie Prescott, Duncan Cross, Pippa Iliff	To analyze how the co-creation of real-world research skills between students and faculty contributes to the development of research competencies in higher education	The "students as partners" model empowers students, transferring applied research competencies and professional confidence through the START approach. This approach, which includes support, time, adaptation, risks, and trust, promotes students becoming co-leaders of scientific design rather than passive assistants.	Qualitative

´11	The Application of Behavior Theory in Classroom Instructional Reform	2020	Le Qi, Tao Gao, Xurong Liang	To analyze the application of behavior theory in classroom teaching reform, explaining how behavioral principles can be used to improve the teaching-learning process and classroom management	Scientifically structured behaviorist strategies, such as token economies, group contingencies, and motivation operations—act as the main driver for predicting, controlling, and enhancing interactive learning behavior. It demonstrates that applying these techniques transforms passive instruction into autonomous and collaborative learning competencies, surpassing traditional mechanical memorization.	Qualitative
´12	State of Research Competencies in Graduate Students of the Master's Degree in Education	2020	Claudia Alejandra Quintana Ramírez & Ana Fernanda Cardona	To analyze the state of research competencies in graduate students of the Master's in Education at the Catholic University of Manizales, identifying the level of development of said competencies	The main finding indicates a direct and significant correlation (Rho = .848) between the effectiveness of teaching strategies and the level of achievement of research competencies in master's students, which are mostly perceived as regular. The main weaknesses are concentrated in the technical-instrumental and scientific-intellectual domains, evidencing the need to implement transversal didactic strategies based on continuous practice and formative research.	Quantitative
´13	From Theory to Practice: Constructivist	2021	Ebtesam Qassim Rababah	To analyze the constructivist learning	The study reveals that teachers' constructivist practices are moderate	Quantitative

	Learning Practices among Jordanian Teachers			practices of kindergarten teachers in Jordan, evaluating the level of application of constructivist strategies in the classroom	to low, evidencing difficulties in implementing active strategies and in the competence to design student-centered classrooms. It highlights that although public school teachers apply these strategies more frequently, it is necessary to strengthen formative research and practical professional development to overcome the gap between theory and action in the classroom.	
´14	Teaching Strategies and Research Competencies of Undergraduate Students at a University in Lima, 2021	2022	Sarina Francisca Ramos Zúñiga	To determine the relationship between teaching strategies and research competencies in undergraduate students at the School of Medical Technology of a university in Lima, 2021	The study conducted at a university in Lima (2021) determined a considerable positive correlation (Rho = 0.515) between teaching strategies and the level of research competencies of undergraduate students. It was concluded that the quality and relevance of teaching methodology directly influence students' ability to formulate problems, analyze data, and write scientific documents.	Quantitative
´15	Scope of a Scientific Investigation	2020	Carlos Ramos Galarza	To reflect on and explain the different scopes of scientific research, describing the exploratory, descriptive,	Based on Hernández-Sampieri's theory, these scopes do not constitute a rigid classification, but rather a dynamic continuum that determines the methodological depth, design, and type of	Qualitative

				correlational, and explanatory levels within the research process	results. This approach strictly depends on the current level of knowledge about the topic and the researcher's purpose, allowing the hybridization of strategies (exploratory, descriptive, correlational, or explanatory) within the same study.	
´16	Neuroeducation and Research Competencies in Higher Education	2022	José Luis Ponce Zambrano & María Fernanda Gómez Villacís	To analyze the relationship between neuroeducation and the development of research competencies in higher education students, identifying its influence on the teaching-learning process	Teaching strategies enhance research competencies by aligning with neuroeducational principles, such as empathetic tutoring and emotion management to activate higher executive functions. Studies highlight that integrating neurobiology effectively to reduce stress (cortisol) and encourage active participation is crucial to overcome the technical-transmissive model and improve scientific learning in graduate programs.	Quantitative
´17	Learning Styles and Promotion of Research Skills in Physiotherapy	2020	María del Carmen Pérez Hernández, Yisel Rodríguez Pérez, Ana María García López	To determine the relationship between learning styles and the development of research skills in Physiotherapy students, identifying	Traditional teaching strategies are insufficient, making it essential to implement "Active Methodologies" that merge theory with practice to develop research skills. Research-based learning (RBL), focused on simulation and analysis of real cases,	Quantitative

				how they influence their academic training	is the most effective approach for students in this discipline.	
´18	Learning Styles, Gender, and Teaching Strategies in the University Context	2021	Mercedes López Aguado	To analyze the relationship between learning styles, gender, and teaching strategies in university students, identifying differences according to sociodemographic variables	The main finding is the existence of a significant correlation between the teacher's teaching strategies and students' preferred styles, evidencing variations according to gender that obligate a transition toward multimodal didactics. It is concluded that university teaching must implement diversified strategies to adapt to the mix of genders and diversity of learning styles, overcoming traditional homogeneous methods.	Quantitative
´19	Undergraduate Research Competencies in Saudi Arabia: Evaluating Active Learning	2020	Abdulrahman M. Alzahrani, Ahmed A. Alzahrani	To evaluate students' research competencies and analyze the impact of active learning on their development within the university educational process	The study indicates that using active and student-centered learning approaches mitigates initial disinterest and elevates motivation toward methodology courses, accelerating the development of research competencies. By implementing interactive strategies such as problem-based learning and collaborative projects, "methodological boredom" is overcome and theory is connected with real-world environments.	Quantitative

´20	Fostering Research Skills in EFL University Students in Vietnam	2022	Nguyen Thi Thu Ha, Tran Thi Ngoc Anh, Le Thi Thanh Huyen	To analyze the development of research skills in Vietnamese English as a Foreign Language (EFL) university students, evaluating the impact of active teaching strategies on their research training	The main finding regarding teaching strategies for fostering research skills in university students indicates that traditional methodologies and summative assessment are insufficient, making the adoption of Project-Based Learning (PBL) and structured scaffolding models essential. These active strategies, together with continuous feedback, are effective for stimulating autonomy and academic writing.	Quantitative

Results and discussion

From the integrative analysis of the literature reviewed using the PRISMA method (N = 20), it is demonstrated that the development of research competencies in higher education is strongly conditioned by the quality of teaching strategies, evidencing substantial statistical correlations ranging from a considerable level in undergraduates (Rho = 0.515; Ramos Zúñiga, 2022) to a very high level in graduate students (Rho = 0.848; Quintana & Cardona, 2018). These findings reveal that success in scientific training does not lie in the simple availability of virtual platforms (Alfaro et al., 2022) or in the application of rigid technical guides (Almonacid-Fierro et al., 2018), but in the activation of Pedagogical Content Knowledge (PCK) and the teacher's pedagogical reasoning (Agudelo, 2021; Khemlani, 2018). In this regard, the literature agrees that traditional passive transmission methods prove insufficient (Pérez et al., 2020; Ha et al., 2022), causing "methodological boredom" that can be mitigated through Problem and Project-Based Learning (Alzahrani & Alzahrani, 2018) and horizontal co-creation models such as the START approach (Prescott et al., 2020), which promote autonomy and structured reflective thinking (Sahoo & Pany, 2020).

Likewise, it is discussed that this transition toward a multimodal and flexible didactics should not only respond to the diversity of students' learning styles and gender (Loor & Mendoza, 2022; López Aguado, 2019), but also to neuroeducational principles that prioritize empathetic tutoring and emotional management to reduce cortisol and release the brain's higher executive functions (Ponce & Gómez, 2022). Although behaviorist perspectives that successfully structure collaborative classroom behavior coexist (Qi et al., 2020), a critical gap persists in the implementation of genuine constructivist practices due to a lack of practical teacher training (Rababah, 2021). Ultimately, this gap requires understanding education as a constantly moving "ontological synchronization" (Akkerman et al., 2021), where formative research acquires true relevance by directly connecting with the realities and needs of the here and now.

Finally, the practical implications of this systematic review obligate a rethinking of teacher training policies within the framework of University Law No. 30220 and RVM 097-2022-MINEDU. The analyzed evidence demonstrates that institutionalizing research through decrees is insufficient if the classroom is not transformed into an active inquiry laboratory. The main limitations of the reviewed literature lie in the

predominantly cross-sectional and correlational nature of the primary studies, with a scarcity of experimental or longitudinal research evaluating the impact of specific didactic programs over the long term.

Conclusions

Teaching strategies constitute the indispensable operational and mediating stimulus for activating research competencies in the university environment. Achieving optimal mastery in scientific formulation or in solving complex problems is not possible if the teacher's didactic design does not break with passive transmission; the quality, diversification, and intentionality of pedagogical intervention directly determine how the student processes, deconstructs, and transforms existing knowledge through the scientific method.

The effectiveness of teaching strategies lies in their dimensions of strategic planning and pedagogical content knowledge. Efficient teaching that breaks down intricate concepts into manageable components, stimulates authentic communicative interactions, and manages the classroom's emotional climate significantly elevates student enthusiasm and autonomy, effectively mitigating methodological disinterest and providing them with solid foundations to face the demands of a constantly transforming world.

The development of inquiry skills in university students is not limited to technical-instrumental mastery but demands comprehensive progress across four critical dimensions: rigorous information search (identification and discernment of source quality), basic and instrumental competencies (comprehensive reading, analysis, and precise writing), attitudinal competencies (scientific ethics, academic honesty, and critical judgment), and metacognitive competencies (reflective capacity and self-regulation in the face of contextual complexity).

A critical discrepancy exists between the academic excellence requirements stipulated by the Peruvian legal framework (University Law No. 30220, Law No. 30512, and RVM 097-2022-MINEDU) and the actual state of students, who are mostly situated at intermediate and low levels of research competency. Given that legislation imperatively penalizes degree conferral without an intellectual graduate product or thesis, universities and graduate schools are compelled to urgently reorient their didactics toward active and applied methodologies that connect theory with field practice.

While international metrics show a quantitative increase in global and regional scientific production, Latin America experiences a concerning decrease in the impact and citation of its work (20.2% decrease). This panorama evidences that publication volume does not automatically translate into social relevance, reinforcing the urgent commitment of universities to promote a flexible and contextualized culture of inquiry, ensuring that future professionals are not passive assistants but co-leaders capable of generating new applicable knowledge for the well-being and progress of the community.

References

Agudelo, K., Flórez, E., Ravanal, E., & Figueroa, R. (2021). El conocimiento pedagógico del contenido (CPC) por el profesor universitario en el uso del método de resolución de problemas. *Revista Boletín Redipe*, *10*(1), 1 - 30. https://doi.org/10.36260/rbr.v10i1.1169

Akkerman, S., Bakker, A., & Penuel, W. (2021). Relevance of educational research: An ontological conceptualization. *Educational Researcher*, *50*(6), 2021. https://doi.org/10.3102/0013189x211028239

Alahmad, M. (2020). Strengths and weaknesses of Cognitive Theory. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *3*(3), 1584-1593. https://doi.org/10.33258/birci.v3i3.1088

Alfaro, M., Paucca, N., Cóquel, L., Méndez, G., Roque, I., & Rafayle, R. (2022). Enseñanza virtual y desarrollo de competencias investigativas. *Horizontes: Revista de Investigación en Ciencias de la Educación*, *6*(25), 1477-1486. https://doi.org/10.33996/revistahorizontes.v6i25.428

Khemlani, S. (2020). En S. Khemlani, Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience. *Reasoning,* 1-45. John Wiley & Sons, Inc. http://dx.doi.org/10.1002/9781119170174.epcn311

Loor, Á., & Mendoza, K. (2022). Estrategia Didáctica para el Fortalecimiento de los Estilos de Aprendizaje de los Estudiantes de Tercer Año de Bachillerato General Unificado de la Unidad Educativa Pedro Agustín López Ramos. *Polo del Conocimiento*, *7*(6), 1352-1362. https://polodelconocimiento.com/ojs/index.php/es/article/download/4141/9721

Pilasombat, P., & Chongcharoan, D. (2022). Research Skills of Research Teachers to Develop Teaching and Learning. *Journal of Innovation and Management*, *7*(1), 166- 178. https://so03.tci-thaijo.org/index.php/journalcim/article/view/258058

Pravat, K., & Sesadeba, M. (2020). Exploring Methods for Reflective Thinking: Synthesis of Reviews. *Pedagogy of Learning*, *36*(4), 34-41. https://www.researchgate.net/publication/352062938

Prescott, J., Cross, D., & Iliff, P. (2020). Co-creating real-world research skills. *International Journal for Students as Partners*, *4*(1), 120-127. https://doi.org/10.15173/ijsap.v4i1.3716

Qi, L., Gao, T., & Liang, X. (2020). The Application of Behavior Theory in Classroom Instructional Reform. *Atlantis Press*, *517*(1), 446-451. https://www.atlantis-press.com/article/125951557.pdf

Quintana, A., & Cardona, A. (2018). Estado de las competencias investigativas en estudiantes de posgrado de la Maestría en Educación de la UCM [Tesis de maestría, Universidad Católica de Manizales]. *Repositorio institucional de la Universidad Católica de Manizales.* https://repositorio.ucm.edu.co/handle/10839/2226

Rababah, E. (2021). From theory to practice: Constructivist learning practices among Jordanian kindergarten teachers. *Cypriot Journal of Educational Sciences*, *16*(2), 612-626. https://doi.org/10.18844/cjes.v16i2.5639

Ramos, S. (2022). Estrategias de enseñanza y competencias investigativas de los estudiantes de pregrado de una universidad de Lima, 2021 [Tesis de maestría, Universidad César Vallejo]. *Repositorio de la Universidad César Vallejo.* https://repositorio.ucv.edu.pe/handle/20.500.12692/79739