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Scientific education in university students: A systematic review

La educación científica en estudiantes universitarios: Una revisión sistemática

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Abstract

A systematic review was conducted following the PRISMA methodology to analyze and synthesize the scientific literature on strategies and challenges in science education for university students. A search was performed in the Scopus, Scielo, ProQuest, and Dialnet databases. Empirical publications containing quantitative, qualitative, or mixed-methods data were selected. Out of a total of 560 identified documents, 30 studies were selected, strictly meeting the eligibility criteria for the final qualitative analysis. The results revealed innovative pedagogical methods and highlighted the effectiveness of active pedagogical approaches, the incorporation of specific digital technologies, and the strengthening of critical analysis skills. The key dimensions identified encompass cognitive, epistemological, procedural, and attitudinal aspects, contributing positively to scientific literacy and providing evidence to guide future educational innovations and institutional policies aimed at strengthening scientific training in higher education.

Keywords: Educational technology, critical thinking, students.

Resumen

Se llevó a cabo una revisión sistemática siguiendo la metodología PRISMA, con el propósito de analizar y sintetizar la disponibilidad científica, sobre las estrategias y los desafíos de la educación científica en estudiantes universitarios, se realizó una búsqueda en las bases de datos Scopus, Scielo, Proquest y Dialnet. Se seleccionaron publicaciones empíricas con datos cuantitativos, cualitativos o mixtos. De un total de 560 documentos identificados, se eligieron 30 estudios, cumpliendo estrictamente con los criterios de elegibilidad para el análisis cualitativo final. Los resultados revelaron métodos pedagógicos innovadores y destacaron la efectividad de los enfoques pedagógicos activos, la incorporación de tecnologías digitales concretas y el fortalecimiento de la capacidad del análisis crítico. Las dimensiones clave identificadas abarcan aspectos cognitivos, epistemológicos, procedimentales y actitudinales, contribuyendo positivamente a la alfabetización científica y proporcionan evidencias para orientar futuras innovaciones educativas y políticas institucionales orientadas a fortalecer la formación científica en la educación superior.

Palabras clave: Tecnología educativa, pensamiento crítico, estudiantes.

Introduction

In today's knowledge society, developing scientific and research competencies has become a fundamental component of higher education. Universities are expected to produce professionals capable of proposing innovative solutions, rigorously analyzing information, and participating actively in knowledge creation (Torres et al., 2025). Nevertheless, empirical evidence continues to reveal persistent shortcomings in how these competencies are taught, including disorganized pedagogical approaches, fragmented curricula, and insufficient faculty preparation (Sandoval & Sáenz, 2023).

Problem-based learning, combined with information and communication technologies, holds promise for promoting scientific competencies and active learning. Yet implementation remains challenging.

Educators encounter students with negative attitudes toward science, limited technological resources, rigid curricula, and faculty who lack adequate training in active methodologies (Galecio, 2026). This situation proves particularly acute in Latin America, especially Peru, where the digital divide disproportionately affects rural areas and university dropout rates reached 120,986 cases in 2024 (Álvarez et al., 2025). Despite academic consensus regarding the importance of research methodology training, empirical data consistently show deficiencies in foundational research capabilities. Students exhibit weaknesses in problem formulation, application of rigorous methodologies, and effective communication of results (Salazar et al., 2025).

Teaching research skills at the university level is far from straightforward, involving both structural and pedagogical challenges. The most significant obstacles include insufficient materials and policies ensuring equitable access to academic databases, the absence of sequential training plans that progress systematically throughout degree programs, limited involvement of external stakeholders in collaborative projects, and minimal use of methods that genuinely teach students to question and analyze information in depth (Flores et al., 2023; Chero, 2025).

From a theoretical standpoint, two major frameworks inform the development of research competencies in university students: Vygotsky's zone of proximal development and social mediation, and Piaget's cognitive conflict theory. Both perspectives converge on the understanding that knowledge is not passively received but actively constructed through interactions with peers, instructors, and cultural tools. However, empirical data reveal significant gaps between theory and practice. The 2022 PISA report indicated that 53% of Latin American students fail to reach Level 2 proficiency in scientific competencies, underscoring the disconnect between theoretical aspirations and educational reality (Urbina, 2025).

Critical thinking constitutes a foundational skill for both academic success and informed civic participation, yet it faces challenges similar to those confronting science education. Effective integration into higher education is hampered by two primary issues: reliance on passive methodologies and widely divergent definitions of critical thinking, particularly in Latin American contexts. To understand its actual impact, systematic identification of pedagogical strategies that enhance critical thinking, along with barriers that impede its development, becomes essential (Rivera et al., 2025).

Given this situation, a significant gap emerges in the literature. No methodical syntheses exist that compile available evidence on the actual effectiveness of educational interventions in university-level science education. Existing reviews tend to focus on isolated aspects, some exclusively on ICT, others solely on active methodologies, and still others only on competencies, without integrating these components into a coherent framework. This fragmentation complicates the design of effective pedagogical strategies and evidence-based educational policies.

Research question: What pedagogical strategies, digital technologies, and research competencies are documented in the science education of university students, and what evidence exists regarding their effectiveness according to empirical studies published between 2020 and 2025?

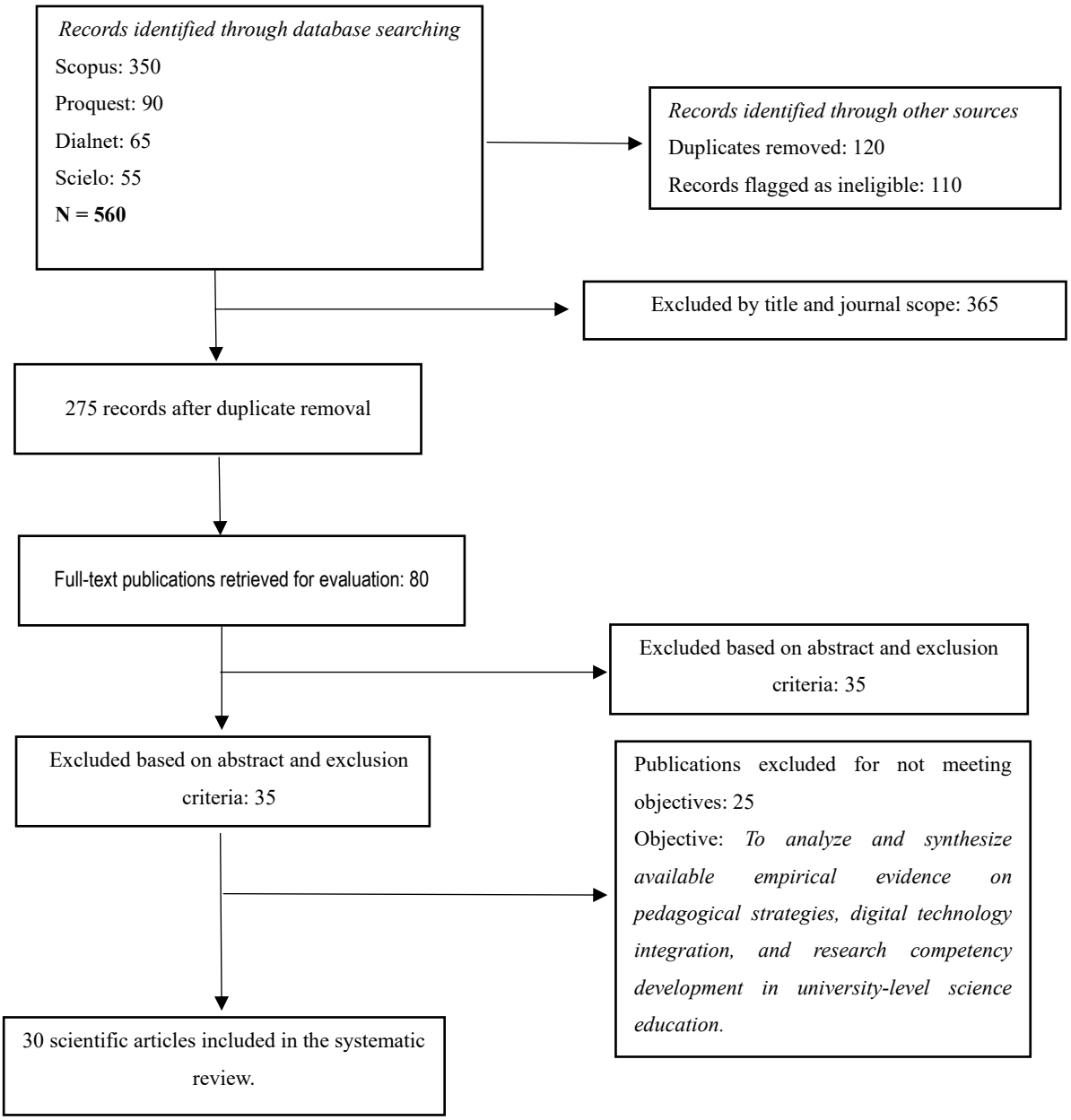
General objective: To analyze and synthesize the scientific evidence regarding strategies and challenges in science education for university students.

Methodology

This research employed a qualitative, documentary, and exploratory approach to examine the state of knowledge on science education in university students through a systematic literature review. Following the 2020 PRISMA guidelines, searches were conducted in Scopus, Web of Science, SciELO, and Redalyc using the search equation ("educación científica" OR "science education") AND ("estudiantes universitarios" OR "university students") AND ("enseñanza de las ciencias" OR "science teaching"). These databases were selected for their coverage of scientific literature in education and social sciences, encompassing both international (Scopus, ProQuest) and Latin American regional (SciELO, Dialnet) sources.

Figure 1

PRISMA flow diagram of the study selection process:



The search was limited to titles, abstracts, and keywords, with language filters applied (Spanish, English, Portuguese) and publication date restrictions (January 2020 – December 2025). No open-access filters were applied to maximize study retrieval.

Results and discussion

Table 1. Systematic review findings

Author and Year	*Objective*	*Study Type*	*Population*	*Findings*
Álvarez et al. (2025)	*To review published scientific articles on research competencies in higher education*	*Systematic literature review*	*32 reviewed articles on higher education students (2013-2022)*	*Reveals low scientific production in South America, lack of solid theoretical models, and unreliable measurement instruments.*
Alviar & Castañeda (2025)	*To analyze teacher digital competence and ICT use in a school in Ica, Peru*	*Qualitative research based on the interpretive paradigm; action research method, descriptive scope, longitudinal design*	*15 teachers from a public educational institution in Ica province, Peru*	*Teachers possess intermediate competence in basic tools but face digital gaps and lack of training in active methodologies.*
Balta et al. (2024)	*To systematize theory on research competency globally*	*Qualitative documentary analysis—theoretical review and systematization*	*22 Scopus and Scielo articles (2014-2024), 14 secondary sources, and 3 books on research competency, professional training, and university teaching*	*Progress toward digitalization is observed, but a significant gap exists between teacher perception and actual performance.*
Bonilla et al. (2023)	*To identify didactic and pedagogical strategies mediated by technology*	*Systematic literature review applying PRISMA methodology*	*52 scientific articles from 2015-2020, from databases including Scielo, Dialnet Plus, JSTOR, Proquest, Science Direct, Scopus, and Emerald Insight*	*Gamification, collaborative learning, and online simulations are the most effective trends for improving academic performance.*
Caballero et al. (2025)	*To analyze recent pedagogical strategies aimed at achieving learning outcomes*	*Systematic literature review following PRISMA protocol*	*11 Scopus studies focused on elementary and secondary education contexts (2020-2025)*	*Active methodologies and metacognition are most effective, provided planning, mentoring, and contextual adaptation are present.*
Cárdenas et al. (2025)	*To propose educational optimization through artificial intelligence use*	*Qualitative projective approach with analytical-synthetic method, documentary analysis, and bibliographic review*	*Bibliographic sources (books, articles, interviews) and normative documents on AI and research competencies*	*AI integration enhances learning personalization, critical thinking, and digital skill development.*

Castillo & Coloma (2026)	*To validate a diagnostic instrument for measuring ICT impact on university teaching-learning*	*Quantitative study with deductive method, descriptive-explanatory scope, and cross-sectional design*	*Sample of 10 anonymous expert teachers in ICT applied to higher education*	*A 22-item instrument was successfully validated (Lawshe model) with high reliability for evaluating this educational process.*
Chero (2025)	*To analyze factors and skills influencing research competency development in university students*	*Systematic review following PRISMA guidelines*	*15 scientific articles, all from 2021-2022; 13 from Scopus and Web of Science, 2 from Google Scholar, all addressing university students or faculty*	*Cross-curricular development of these competencies using the scientific method and technology is necessary to overcome deficiencies in autonomy and scientific production.*
Espino et al. (2023)	*To review literature on educational quality in university higher education*	*Qualitative systematic review guided by PRISMA methodology*	*Academic articles indexed in ERIC, Scopus, and Web of Science (WoS) (2019-2023)*	*Educational quality requires a multidimensional approach integrating active pedagogies, technology, student self-regulation, solid institutional management, and equity.*
Flores et al. (2020)	*To evaluate wiki impact in virtual classrooms on teaching processes at a private university in Lima*	*Quasi-experimental design with pretest and posttest, intact control and experimental groups*	*80 students from the Faculty of Engineering and Architecture at a private university in Lima; 40 assigned to experimental group, 40 to control*	*Wiki significantly improves collaborative learning by strengthening positive interdependence, co-construction of meanings, and psychosocial relationships.*
Flores et al. (2023)	*To verify that research training genuinely improves teaching and learning at the university level*	*Systematic review following PRISMA guidelines*	*14 scientific articles from Scielo, SAGE Journals, Scopus, Dialnet, Google Scholar, and Web of Science (2015-2023)*	*Cognitive and management skills improved, though limitations persist due to inadequate faculty training and lack of integrated curricular focus.*
Fuentes & Rivera (2022)	*To identify personal, contextual, and academic factors associated with course failure in university students*	*Quantitative, non-experimental, cross-sectional study with a multilevel logistic model*	*3,806 students from 12 Mexican universities across ten undergraduate programs including Psychology, Medicine, Veterinary Science, Engineering, Chemistry, Law, among others*	*Course failure was linked to personal and contextual factors (e.g., long commutes, economic difficulties), while academic factors did not show significant association.*
Galecio (2026)	*To analyze scientific inquiry effects on students*	*Systematic literature review following PRISMA protocol*	*21 articles (11 Scopus, 10 Scielo), 2020-2025, open access,*	*Inquiry improves with prior training, STEAM approaches, and constant feedback; however,*

			English/Spanish; pre-2020 articles excluded	*deficiencies persist in scientific literacy and initial teacher preparation.*
González (2024)	*To implement active and critical strategies in pedagogical approaches to develop pedagogical culture in teacher trainees*	*Qualitative research combining theoretical and empirical methods, implementing a methodological proposal based on active strategies*	*86 students and 14 professors from Early Childhood and Basic Education at Salesian Polytechnic University, Guayaquil, 2017-2023*	*Active strategies overcame initial teaching deficiencies, achieving meaningful learning and preparation for transformative educational practice.*
Huisa et al. (2025)	*To identify and analyze university programs, activities, and interventions for developing research competencies in students*	*Systematic literature review without explicit PRISMA specification, but with qualitative and quantitative analysis of included studies*	*41 studies from various databases (2019-2025)*	*Integrated curricular programs achieved positive impacts on students' research skills, attitudes, and research productivity.*
León et al. (2025)	*To study TPACK model implementation in the classroom and its outcomes*	*Bibliographic/literature review*	*Scientific articles and theses (12 selected studies from Google Scholar, Mendeley, academic repositories, and Scielo)*	*TPACK is an effective framework for technology integration, enhancing competencies and learning, though ongoing educator training is required.*
López (2024)	*To develop an educational model for scientific skill development based on scientific inquiry*	*Applied research with quasi-experimental design, quantitative approach, pretest and posttest; Mann-Whitney U test used for hypothesis testing*	*Fifth-grade elementary students divided into control and experimental groups, both completed pretest and posttest*	*Scientific inquiry in primary education improved all research competencies, outperforming memorization-based methods and achieving more durable learning.*
Neira & Lima (2025)	*To analyze factors favoring development of inquiry competency through literature review*	*Bibliographic review/documentary analysis with qualitative approach*	*41 sources (articles, theses, publications) from Scopus, Google Scholar, Scielo, Dialnet, Ebsco, Redalyc, including quantitative, qualitative, and mixed-methods studies*	*Inquiry as a strategy promotes critical thinking, autonomy, and teamwork from elementary through university levels.*
Obermeier (2023)	*To propose improvement of higher education structures*	*Critical systematic literature review with qualitative approach and thematic analysis;*	*Documents (12 articles and 7 books) from scientific databases and gray literature, recognized references*	*Proposes transforming universities into intelligent organizations through transformational leadership and systems*

		included scientific articles (1998-2019)	*on intelligent organizations, organizational change, and organizational culture*	*thinking to produce adaptable graduates.*
Olmedo et al. (2024)	*To explore innovative teaching methods that increase student engagement and motivation through personalization and critical thinking*	*Quantitative study using structured survey with descriptive and inferential analysis, with data triangulation*	*52 teachers selected by inclusion criteria considering academic discipline diversity and educational levels*	*Project-based learning and interactive digital tools are the most used strategies; technological challenges persist, and feedback is highly valued.*
Pacheco (2023)	*To analyze current challenges facing university teaching*	*Systematic literature review following PRISMA criteria; descriptive research*	*23 articles selected from an initial search of 591 documents in Google Scholar, ProQuest, EBSCO Host, Science Direct, and Scielo (2018-2022)*	*Faculty face lack of digital competencies, technological gaps, and resistance to change, requiring curricular adaptation and ongoing training.*
Rivera et al. (2026)	*To analyze implications and development of critical thinking in university students*	*Systematic literature review following PRISMA guidelines*	*21 scientific articles from Scopus (2), Web of Science (12), and Scielo (7) (2021-2025)*	*Critical thinking is enhanced by conceptual mapping, simulations, and ICT, requiring autonomous environments and critically minded faculty.*
Salazar et al. (2025)	*To analyze research competencies present in students*	*Systematic literature review following PRISMA protocol*	*20 scientific articles from Scopus (13) and Scielo (7) (2021-2025)*	*These competencies are strengthened by strategies promoting active participation and critical thinking, while requiring institutional commitment and reduction of digital gaps.*
Sandoval & Sáenz (2023)	*To examine research on research competencies in higher education students*	*Systematic literature review following PRISMA guidelines*	*32 empirical studies (quantitative and mixed) from Web of Science and Scopus (2013-2022)*	*Low scientific productivity detected in South America and lack of solid models; students show deficiencies in methodology and communication of results.*
Santiago & Garvich (2024)	*To analyze digital competencies and ICT integration in higher education*	*Systematic literature review following PRISMA protocol with descriptive, documentary,*	*10 scientific articles from Scopus, Eric, and SciELO, from an initial search of 311 records (2007-2022)*	*Intermediate level of teacher digital competence found; TPACK guides technology integration, but*

	teaching-learning processes	*exploratory, and quantitative approach*		*ongoing faculty training remains insufficient.*
Tasayco & Bermeo (2025)	*To analyze scientific evidence on pedagogical strategies for achieving learning outcomes in basic education*	*Systematic literature review following PRISMA protocol*	*11 scientific articles from an initial search of 218 articles, focused on basic and secondary education (2020-2025)*	*In elementary and secondary education, active and metacognitive methodologies stand out; success requires structured planning and teacher accompaniment.*
Torres et al. (2025)	*To characterize scientific production on research competencies in university students within Scopus*	*Systematic literature review following PRISMA Declaration*	*25 scientific articles from Scopus following an initial search of 690 documents and application of inclusion/exclusion criteria (2019-2023)*	*Quantitative studies based on self-perception predominate; weaknesses identified in database use and methodological skills.*
Urbina (2025)	*To analyze learning strategies employed by university-level students*	*Systematic literature review with descriptive design and qualitative approach following PRISMA guidelines*	*39 scientific articles from Web of Science (13) and Scopus (9) (2020-2024)*	*Students use support and repetition strategies, but dependence on basic methods persists, suggesting the need for targeted interventions.*
Auris et al. (2024)	*To systematically review key factors and skills for developing research competencies in university students*	*Systematic literature review following PRISMA guidelines*	*15 scientific articles selected: initially 13 from Scopus and Web of Science (initial search of 524 documents), plus 2 additional from Google Scholar and Redalyc (2021-2022)*	*Despite initial limitations, using research seedbeds and technology from early semesters enables holistic research culture development.*
Yucra (2023)	*To analyze implementation proposals for strategies strengthening research competencies in higher education*	*Systematic literature review following PRISMA protocol*	*11 scientific articles focused on university students*	*Effective strategies include research integrated into the curriculum and interdisciplinary mentoring, promoting active and responsible student roles.*

The following dimensions were considered for the study variable of science education:

Active Pedagogical Strategies and Methods

Of the 30 studies analyzed, 27 (90%) addressed active pedagogical strategies. These approaches position students as protagonists in their own learning. The most frequently employed strategies included problem-based learning (60% of studies), collaborative learning (50%), gamification (40%), and scientific inquiry (26.7%) (Bonilla et al., 2023; Chero, 2025; Tasayco & Bermeo, 2025). These approaches demonstrated positive effects on research competencies and critical thinking in 73.3% of cases, with

moderate to large effect sizes reported (Cohen's d between 0.62 and 0.87) (González, 2024; Galecio, 2026). Scientific inquiry emerged as the most effective strategy (87.5% of studies reporting positive effects), followed by collaborative learning (80%), whereas traditional lecture-based approaches proved insufficient for developing research skills (Galecio, 2026; Flores et al., 2023). Nonetheless, Caballero et al. (2025) and Tasayco and Bermeo (2025) caution that success depends critically on structured planning, continuous teacher mentoring, and contextual adaptation.

Digital Technology Integration (ICT)

Twenty-four studies (80%) addressed ICT integration, identifying TPACK as the dominant theoretical framework (60% of studies) (León et al., 2025; Santiago & Garvich, 2024). Reported levels of teacher digital competence were predominantly intermediate, with strengths in basic tools but weaknesses in creating complex solutions (Alviar & Castañeda, 2025).

The primary barriers identified included the digital divide (26.7% of studies) and insufficient ongoing faculty training (20%) (Álvarez et al., 2025; Pacheco, 2023). Only 13.3% of studies utilized instruments with validated psychometric properties, with the notable exception of Castillo and Coloma (2026), who conducted rigorous validation. A persistent gap exists between TPACK theory and classroom practice, which remains predominantly instrumental and transmission-oriented rather than transformative (León et al., 2025).

Development of Scientific and Research Competencies

All 30 studies addressed the development of research competencies, identifying asymmetrical development across three subdimensions (Chero, 2025; Salazar et al., 2025). In the cognitive subdimension, serious deficiencies persist: problem formulation (60% of studies), autonomous database management (50%), application of rigorous methodologies (40%), and critical source analysis (33.3%) (Torres et al., 2025). In the procedural subdimension, results were more promising, with 66.7% of studies reporting significant improvements attributed to scientific inquiry approaches, distributed scaffolding, STEAM approaches, and constant feedback (Galecio, 2026). In the attitudinal subdimension, 40% of studies reported gains in motivation. However, negative attitudes persist when students fail to perceive practical relevance in what they learn (Salazar et al., 2025). Only 26.7% of studies employed validated instruments (Sandoval & Sáenz, 2023).

Conclusions

First, active pedagogical strategies prove effective in 73.3% of cases for developing research competencies in university students. Nevertheless, their success is not guaranteed, as it depends on structured planning, teacher accompaniment, and contextual adaptation.

Second, the TPACK model dominates ICT integration discourse, appearing in 60% of studies. However, a persistent gap remains between theoretical frameworks and classroom reality. Teacher digital competence levels are intermediate, and the most common barriers are the digital divide (26.7% of studies) and insufficient ongoing training (20%).

Third, research competencies develop asymmetrically. In the cognitive dimension, serious deficiencies persist: 60% of studies report problems in problem formulation, and 50% in database management. In the procedural dimension, skills improve through scientific inquiry. In the attitudinal dimension, motivation gains appear in 40% of studies, though resistance emerges when practical relevance is lacking, highlighting the need for continuous teacher training.

References

Alvarez-Alvarez, C., Del Arco-Bravo, I., Flores-Alarcia, O., & Ramos-Pla, A. (2025). *Estudiantes universitarios rurales y urbanos y su vulnerabilidad frente a lo tecnológico : revisión sistemática*.

Revista Educ. Pesqui., São Paulo, v. 51, e279787, 2025. https://www.scielo.br/j/ep/a/WfSd7cqKTHYGbSz97kN5M4B/?lang=es

Alviar-Luján, R., Welson-Valencia, M. & Castañeda-Castañeda, I. (2025). *Competencia Digital Docente a través de la Integración de las TIC en una Institución Educativa Pública de Ica*. Revista Tecnológica Educativa Docentes 2.0, 18(1), 351-365. https://doi.org/10.37843/rted.v18i1.639

Arango-Hernández, Y., Sosa-Castillo, A., & Valdés-Valdés, P. *(2022). Equidad en la educación superior: un acercamiento desde la teoría*. Revista Estudios del Desarrollo Social: Cuba y América Latina, 10(1). Epub 01 de abril de 2022. Recuperado en 12 de mayo de 2026, de http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2308-01322022000100014&lng=es&tlng=es.

Armada-Pacheco, J. (2023). *Desafíos de la docencia universitaria ante la educación 4.0.* e-Revista Multidisciplinaria del Saber, 1, e-RMS01052023. Epub 01 de julio de 2023. https://doi.org/10.61286/e-rms.v1i.11

Auris-Villegas, D., Mendoza-Rejas, J., Mendoza-Rejas, A., Cabrera-Morales, T., & Canchari-Vásquez, U. (2024). *Política de la educación universitaria en Perú: Una revisión sistemática.* Horizontes Revista De Investigación En Ciencias De La Educación, 8(35), 2578–2595. https://doi.org/10.33996/revistahorizontes.v8i35.889

Balta-Sevillano, G., Urquizo-Esparza, R., Velásquez-Pila, M., & Bello-Vilcapoma, V. (2024). *Las percepciones de la competencia investigativa en el desarrollo de investigación científica en la educación superior*. Revista InveCom ISSN En línea: 2739-0063, 5(1), 1-9. https://doi.org/10.5281/zenodo.11110120

Bonilla-Torres, C., Gómez-Contreras, J., & Esteban-Ojeda, Y. (2023). *Didactic and pedagogical strategies, pedagogical models and technological tools in higher education mediated by TIC*. Revista Sophia, ISSN-e 2346-0806, ISSN 1794-8932, Vol. 19, N.º. 1, 2023. http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S1794-89322023000100008

Caballero-Meneses, S., Vergara-Causo, E., Gardi-Melgarejo, V., & Rodriguez-Barboza, J. (2025). *Metodologías activas en la educación latinoamericana : una revisión sistemática sobre su impacto en el aprendizaje significativo*. Revista InveCom ISSN En línea: 2739-0063, 6(2), 1-9. https://doi.org/10.5281/zenodo.16076292

Cardenas-Rivera, M., Meléndez-Cruz, J., & Valencia-Loida L. (2026). *Revisión sistemática sobre las implicancias del pensamiento crítico en estudiantes.* Revista InveCom, 6(1), e601097. Epub 15 de julio de 2025. https://doi.org/10.5281/zenodo.15616871

Cárdenas-Velasco, K., Moreira-Benavides, J., Amores-Pacheco, C., & Núñez-Santiana, M. (2025). *Desarrollo de competencias investigativas a través de la inteligencia artificial. Un enfoque innovador*. Revista Cátedra, 8(1), 18-38. https://doi.org/10.29166/catedra.v8i1.6621

Castillo, R., & Coloma, M. (2026). *Validación de un instrumento para diagnosticar la integración de las TIC en la educación superior*. Revista InveCom ISSN En línea: 2739-0063, 6(1), 1-10. https://doi.org/10.5281/zenodo.15330753

Chero-Pisfil, Z (2025). *Competencias investigativas en universitarios: Una revisión sistemática. Horizontes* Revista de Investigación en Ciencias de la Educación, 9(38), 2305-2316. Epub 01 de abril de 2025. https://doi.org/10.33996/revistahorizontes.v9i38.1052

Espino-Wuffarden, J., Morón-Hernández, J., Huamán-Munares, L., Soto-Saldaña, B. & Morón-Hernández, L. (2023). *El desarrollo de la calidad educativa en educación superior universitaria: Revisión sistemática 2019-2023.* Revista Comuni@cción, 14(4), 348-359. Epub 26 de diciembre de 2023. https://doi.org/10.33595/2226-1478.14.4.876

Flores-Limo, F., Flores-Limo, J., Campos-Dávila, J., & Asencios-Trujillo, L. (2023). *La investigación formativa en el proceso de enseñanza-aprendizaje en la educación superior: Una revisión sistemática.* Ciencia Latina Revista Científica Multidisciplinar, 7(2), 8648-8663. https://doi.org/10.37811/cl_rcm.v7i2.5981

Flores-Cueto, J., Garay-Argandoña, R., & Hernández-Ronald M. (2020). *El uso de la wiki y la mejora en el aprendizaje colaborativo.* Revista Propósitos y Representaciones, 8(1), e447. https://doi.org/10.20511/pyr2020.v8n1.447

Fuentes-Balderrama, J., & Rivera-Heredia, M. (2022). *Factores personales, contextuales y académicos asociados a la reprobación en educación superior: una muestra nacional mexicana. Revista mexicana de investigación educativa, 27(95), 1039-1062.* Epub 30 de enero de 2023. Recuperado en 11 de mayo de 2026, de http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-66662022000401039&lng=es&tlng=es.

Galecio-Mora, D. (2026). *Indagación científica en estudiantes: una revisión sistemática. Revista InveCom, 6(1), e601054*. Epub July 15, 2025. https://doi.org/10.5281/zenodo.15400715

González-Rivera, P. (2024). *Estrategias activas y corrientes pedagógicas en la formación docente. Mendive. Revista de Educación, 22(2),* Epub 30 de junio de 2024. Recuperado en 11 de mayo de 2026, de http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1815-76962024000200016&lng=es&tlng=es.

Huisa-Yucra, M., Huisa-Yucra, R., Bellido-García, R. S., Bautista-Cóndor, J. L., & Rejas-Borjas, L. G (2025). *Desarrollo y evaluación de competencias investigativas en estudiantes universitarios: una revisión sistemática*. Revista Universidad Y Sociedad, 18(2), e5790 https://rus.ucf.edu.cu/index.php/rus/article/view/5790

León-Naranjo, J., Vargas-San Lucas, G., & García-Vásquez, H. (2025). *El modelo tpack como marco para la integración pedagógica de la tecnología en el aula. Aula Virtual, 6(13), e427.* Epub 19 de junio de 2025. https://doi.org/10.5281/zenodo.15126677

López-Chira, C. (2024). *Modelo educativo para fortalecer competencias investigativas en estudiantes del nivel primario. Revista Universidad, Ciencia y Tecnología, 28(especial), 152-162.* Epub 30 de diciembre de 2024. https://doi.org/10.47460/uct.v28ispecial.785

Neira-Fernández, S., & Lima-Vargas, M. (2025). *La inclusión como desafío en la gestión educativa contemporánea desde una revisión sistemática*. Revista InveCom, 5(4), e504103. Epub 12 de junio de 2025. https://doi.org/10.5281/zenodo.15048262

Olmedo-Rodríguez, E., Berrú-Torres, C., Escaleras-Encarnación, V., Angamarca-Guamán, A., Banegas-Ullauri, R., Gaona-Torres, R., & Parra-Cleri, L. (2024). *Innovación en métodos de enseñanza: estrategias y desafíos para el compromiso y motivación estudiantil.* Revista InveCom, 4(2), e040251. Epub 21 de julio de 2024. https://doi.org/10.5281/zenodo.10655843

Salazar-Peralta, J., Meléndez-Cruz, J., & Cardenas-Rivera, M. (2026). *Competencias investigativas de los estudiantes: un artículo de revisión sistemática*. Revista InveCom, 6(2), e602032. Epub 08 de agosto de 2025. https://doi.org/10.5281/zenodo.15866881

Sandoval-Henríquez, F., & Sáez-Delgado, F. (2023). *Revisión sistemática sobre competencias de investigación en estudiantes de educación superior.* Revista Páginas de Educación, 16(2), 186-211. Epub 01 de diciembre de 2023. https://doi.org/10.22235/pe.v16i2.3340

Santiago-Trujillo, Y., & Garvich-Ormeño, R. (2024). *Competencias Digitales e Integración de las TIC en el Proceso de Enseñanza-Aprendizaje*. Revista Tecnológica-Educativa Docentes 2.0, 17(1), 50-65. Epub 06 de noviembre de 2024. https://doi.org/10.37843/rted.v17i1.405

Tasayco-Diaz, A., & Bermeo-Berrú, S. (2025). *Estrategias pedagógicas en el logro de aprendizajes: una revisión sistemática de estudios recientes*. Revista Aula Virtual, 6(13), e546. Epub 01 de octubre de 2025.https://doi.org/10.5281/zenodo.17093994

Tasayco-Jala, A., Menacho-Vargas, I., Magallanes-Yataco, E., & Ralli-Magipo, L. (2024). *El pensamiento crítico en la investigación de los estudiantes universitarios. Aula Virtual, 5(12), e337.* Epub 25 de noviembre de 2024. https://doi.org/10.5281/zenodo.13199188

Torres-Cañizalez, P., Cobo-Beltrán, J., Agüero-Ynca, M., García-Bravo, B. *(2025). Producción científica en Scopus sobre competencias investigativas en estudiantes universitarios: Una revisión sistemática.*

Revista Científica UISRAEL, ISSN-e 2631-2786, Vol. 12, Nº. 1, 2025, págs. 49-71. https://dialnet.unirioja.es/servlet/articulo?codigo=9980804

Umpiérrez-Oroño, S., Píriz-Giménez, N., Jimena-Olivero, M., Cabrera-Borges, C., & Donato, N. (2023). *Competencias científicas y modelización: estudio de un caso en la formación de docentes*. Revista Ciência & Educação, Bauru, v. 29, e23046, 2023. https://doi.org/10.1590/1516-731320230046

Urbina-Gutierrez, K. (2026). *Estrategias de aprendizaje en estudiantes universitarios: una revisión sistemática.* Revista InveCom, 6(2), e602090. Epub 30 de septiembre de 2025. https://doi.org/10.5281/zenodo.17011254

Velasco-Barragán, B. (2025). *El aprendizaje basado en problemas como recurso en el mejoramiento académico de las matemáticas. Episteme Koinonía.* Revista Electrónica de Ciencias de la Educación, Humanidades, Artes y Bellas Artes, 8(15), 65-84. Epub 01 de junio de 2025. https://doi.org/10.35381/e.k.v7i14.4358

Yucra-Camposano, J. (2023). *Fortalecimiento de competencias investigativas: una revisión sistemática de estrategias utilizadas en la educación superior*. *Chakiñan,* Revista De Ciencias Sociales Y Humanidades, 21, 210-228. https://doi.org/10.37135/chk.002.21.14