REVISTA INVECOM
ISSN en línea: 2739-0063

Development of critical thinking in higher education: a systematic review

Desarrollo del pensamiento crítico en la educación superior: una revisión sistemática

Received: 30/04/2026 - **Accepted:** 24/07/2026

Giovana Edith Ruiz Villavicencio
https://orcid.org/0000-0001-9216-4456
gruizvi01@ucvvirtual.edu.pe
Universidad César Vallejo. Lima, Peru

Ricardo Edmundo Ruiz Villavicencio
https://orcid.org/0000-0002-1353-1463
ricaroruiz20@hotmail.com
Universidad César Vallejo. Lima, Peru

Hugo Rolando Juro Córdova
https://orcid.org/0009-0008-9858-269X
hiugojuro@yahoo.com
Universidad Católica de Trujillo. Trujillo, Peru

Frank Luis Barreto Camones
https://orcid.org/0000-0002-0425-8821
frankbarretocamones@gmail.com
Universidad César Vallejo. Huaraz, Peru

Abstract

This systematic review highlights the importance of developing critical thinking skills in university students as a process that strengthens their autonomy, timely decision-making, and effective problem-solving abilities, thus benefiting their personal and academic growth. The objective was to describe the relevance of critical thinking in university education. To this end, a review of articles extracted from the Scielo and Scopus databases was conducted using the PRISMA method, which allowed for the selection of studies based on strict inclusion and exclusion criteria. Ultimately, 20 articles published between 2020 and 2025, in Spanish and English, were selected. These articles addressed the conceptions and importance of developing critical thinking. The review concludes that critical thinking is fundamental, as it fosters interaction and engagement between teachers and students. Furthermore, it implies that teachers should promote its development in university students by strengthening skills such as argumentation, analysis, problem-solving, and evaluation.

Keywords: critical thinking, skills, university students.

Resumen

El presente artículo de revisión sistemática destaca la importancia del desarrollo del pensamiento crítico en estudiantes universitarios como un proceso que fortalece su autonomía, la toma de decisiones oportunas y la resolución efectiva de problemas, en beneficio de su crecimiento personal y académico. El objetivo fue describir la relevancia del pensamiento crítico en la formación universitaria. Para ello, se realizó una revisión de artículos extraídos de las bases de datos Scielo y Scopus, mediante la aplicación del método PRISMA, lo que permitió seleccionar estudios bajo estrictos criterios de inclusión y exclusión. Finalmente, se eligieron 20 artículos publicados entre 2020 y 2025, en idioma español e inglés, los cuales abordaron las concepciones y la importancia del desarrollo del pensamiento crítico. Se concluye que este es fundamental, ya que favorece la interacción y el compromiso entre docentes y estudiantes. Asimismo, implica que el docente debe promover su desarrollo en los universitarios mediante el fortalecimiento de habilidades como argumentar, analizar, resolver problemas y evaluar.

Palabras claves: pensamiento crítico, habilidades, estudiantes universitarios.

Introduction

Higher education today confronts a range of social and, above all, pedagogical challenges. These conditions make it essential for university students to develop more than the ability to voice their ideas and opinions; they also need a constructive critical capacity that allows them to bring about meaningful change in their academic and professional development (Vendrell & Rodríguez, 2020).

It is widely acknowledged that all students possess some capacity for thought; even so, education, guided by instructors, must implement deliberate strategies that foster critical thinking, so that students are equipped to make sound decisions when confronted with the situations that arise throughout their academic lives (Castañeda et al., 2024).

Critical thinking can be defined as the capacity to analyze, evaluate, and synthesize information in a reflective and critical manner (Benavides & Ruíz, 2022). It constitutes a rational, self-regulated, and conscious process directed toward problem-solving and timely decision-making (Chávez, 2025). Its presence is indispensable in educational settings, since its absence can undermine students' learning and academic performance throughout their training (Wang & Wu, 2023).

This form of thinking should not be understood solely as a rational skill that follows from action; it should also be viewed as a process bound up with the opinions and beliefs students construct in response to the situations they face (Rhodes et al., 2020). Along the same lines, it is recognized as a key competency for learning, academic success, and decision-making within educational settings (Brookfield, 2020).

Critical thinking likewise operates as an active metacognitive process that enables reflective, critical judgment and, in turn, supports effective problem-solving (Velázquez-Tejeda et al., 2023). It also helps students make sense of the world around them and better evaluate the actions that shape their everyday academic practice (Díaz, 2022).

Cultivating critical thinking in higher education calls for creative academic activities that move from the familiar toward the unfamiliar, thereby strengthening students' cognitive and emotional capacities (Morales & Díaz-Barriga, 2021). Instructors play a central role in this process, as they must employ methodological strategies that encourage dialogue, critical opinion, and the search for alternative solutions when conflicts arise (Latorre-Cosculluela et al., 2020). It likewise falls to instructors to motivate students to question the information they receive and to build the critical thinking skills that contribute to their academic success (Núñez-Lira et al., 2020).

This capacity enriches thinking overall by promoting the acquisition of knowledge, comprehension, and introspection, along with the development of skills such as argumentation, analysis, and problem-solving among university students (Cangalaya, 2020). It should likewise not be reduced to the mere accumulation of information; rather, it should be oriented toward building knowledge through critical thinking, which in turn supports timely decision-making and the resolution of everyday problems (Bellaera et al., 2021).

In this sense, critical thinking is a prerequisite for meaningful learning, as it facilitates comprehension, goal-oriented problem-solving, and effective interaction with others (Soto-Uriol et al., 2023). It further incorporates essential elements such as comprehension, inference, and argumentation of the information received-elements that instructors must promote, assess, and value in order to help students transform what they have learned and apply it to new situations (Gómez-Gómez & Botero-Bedoya, 2020).

Given the foregoing, strengthening critical thinking among students is of fundamental importance. Achieving this depends on instructor support, since teachers play a decisive role in fostering the cognitive development and skills students need to confront the difficulties of everyday life (López et al., 2022). Critical thinking, in this way, allows students to exercise criticality constructively in the face of the often-contradictory behaviors, perspectives, and opinions they encounter in daily life (Elizalde et al., 2020).

Developing critical thinking also fosters student proactivity from a reflective, participatory, and critical standpoint. For that reason, it should be regarded as a generic competency running through every stage of academic training, since learning is not simply a matter of memorizing information but of understanding it and adopting a critical stance toward it (Tasayco et al., 2024). Instructors, accordingly, carry out an important mission in transforming students' mindsets by cultivating critical thinking and strengthening academic performance (Fonseca & Castiblanco, 2020).

The present study therefore sets out to examine the importance of developing critical thinking among university students. Its general objective is to describe that importance within the context of higher education, with a view to strengthening formative processes that are more reflective, autonomous, and meaningful, and that respond to today's academic and social demands.

Methodology

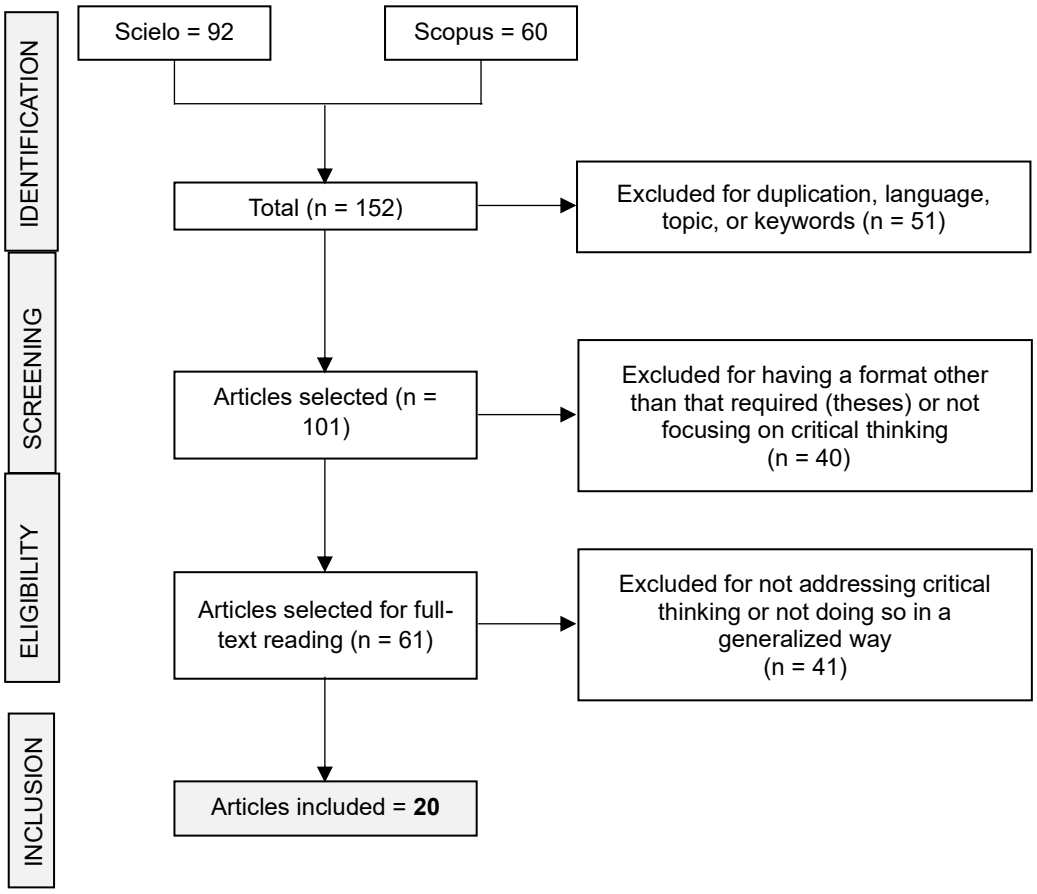
This systematic review was carried out by searching the Scielo and Scopus databases using keywords such as “thinking,” “critical,” and “critical thinking.” This strategy made it possible to identify studies on critical thinking among university students published between 2020 and 2025.

In Scielo, the search conducted using the terms “thinking” and “critical thinking in students” returned 203 results. After applying the corresponding filters, 152 articles were obtained, of which 92 fell within the established publication period. In Scopus, meanwhile, the search equation used was “*thought*” *AND* (+) “*critical thinking*” *OR* “*critical thinking in university students*”, which retrieved 60 results in English. Across both databases combined, 152 scientific articles published between 2020 and 2025 were identified. After removing duplicates and discarding studies unrelated to the topic, the final sample consisted of 20 articles, selected for their relevance and their fit with the review criteria.

The inclusion criteria comprised articles published in Scielo and Scopus, in Spanish or English, within the 2020–2025 period, provided that they addressed critical thinking among university students. Conversely, studies unrelated to the topic were excluded, as were duplicate articles and those drawn from databases other than the two selected.

Figure 1

PRISMA flow diagram



As the diagram shows, the PRISMA method made it possible to systematize the review of 152 articles. During the identification phase, the Scielo and Scopus databases were searched; 51 articles were subsequently excluded for duplication, language, or lack of relevance to the topic. During the screening phase, 40 studies were discarded because they had a format other than that required, mainly theses, or bore no relation to critical thinking among university students. During the eligibility phase, a further 41 articles were excluded, as they did not directly address critical thinking or mentioned it only in relation to students at educational institutions unconnected with the

university level. Finally, during the inclusion phase, 20 articles that met the established criteria were selected for analysis and interpretation in line with the study's subject matter.

Results and discussion

The results of the exhaustive review of the selected articles show that the development of critical thinking among university students is of vital importance, as it supports the analysis and evaluation of information as well as the resolution of complex problems. It also contributes to students' personal development, autonomy, and ethical conduct. Along these lines, Vendrell and Rodríguez (2020) observed that university students need to strengthen their capacity to think with confidence in order to bring about meaningful change in their training. Castañeda et al. (2024), for their part, emphasized that responsibility for implementing academic activities that foster critical thinking rests with instructors.

With respect to how critical thinking is conceptualized, the review identified a range of approaches. Benavides and Ruíz (2022) defined it as the capacity to analyze information, whereas Chávez (2025) regarded it as a rational process. Rhodes et al. (2020), however, challenged this latter view, arguing that critical thinking should not be understood merely as a rational skill but as a process that also manifests itself through students' understanding, opinions, and beliefs. Along similar lines, Wang and Wu (2023) noted that deficient thinking can undermine learning and academic success. Velázquez-Tejeda et al. (2023), meanwhile, underscored the importance of fostering critical judgment oriented toward effective problem-solving, while Díaz (2022) cautioned that students still do not receive the recognition needed to apply critical thinking in their everyday lives.

In practice, critical thinking supports decision-making and problem-solving in the university setting by enabling students to form reflective judgments and pursue timely, creative solutions based on the information available to them. Morales and Díaz-Barriga (2021) argued that creative activities are needed to strengthen the cognitive and emotional development that underlies critical thinking. Latorre-Cosculluela et al. (2020) similarly proposed that instructors develop strategies to encourage critical opinion among students, while Núñez-Lira et al. (2020) highlighted the importance of instructor motivation in prompting students to question the information they receive. Cangalaya (2020), in turn, stressed the need to strengthen argumentation so that students adopt a critical stance and make timely decisions when facing the problems of academic life. Bellaera et al. (2021) likewise noted that this kind of thinking must respond not only to academic demands but also to the challenges of everyday life, and Soto-Uriol et al. (2023) added that it contributes to the achievement of educational goals and to how students conduct themselves around others.

There are, in addition, several essential elements that foster the development of critical thinking, among them comprehension, inference, and the argumentation of information received. Gómez-Gómez and Botero-Bedoya (2020) noted that these elements must be assessed and valued in order to transform what students have learned and apply it to new situations. López et al. (2022) likewise pointed to the need to strengthen the cognitive development and skills required to confront the difficulties of daily life. Elizalde et al. (2020), however, cautioned that contradictory behaviors and opinions among students can limit the effective development of this capacity. Tasayco et al. (2024), in this regard, maintained that critical thinking does not develop through memorization but through a reflective and critical attitude. Finally, Fonseca and Castiblanco (2020) emphasized that instructors' role should be oriented toward transforming students' mindsets by promoting critical thinking and strengthening both personal and academic performance.

Conclusions

Critical thinking is a fundamental component of university education, as it strengthens interaction and engagement between instructors and students. Developing it requires pedagogical support from instructors, who must foster skills such as argumentation, analysis, problem-solving, and the evaluation of information among university students, so as to promote deeper and more meaningful learning.

Critical thinking also fosters mental independence, a reflective attitude, and proactive questioning in response to the various situations that arise in academic settings. These capacities enable students to draw better-grounded conclusions and make timely decisions, not only within the university environment but also in their personal and professional lives, thereby contributing to their formation as ethical, responsible professionals committed to their communities.

Consequently, university students who develop critical thinking strengthen skills that are essential to their academic performance and to their future professional practice. Higher education institutions, for this reason, must incorporate pedagogical strategies that promote this competency as a central part of students' comprehensive formation.

CC BY

References

Bellaera, L., Weinstein-Jones, Y., Ilie, S., & Baker, S. T. (2021). Critical thinking in practice: The priorities and practices of instructors teaching in higher education. *Thinking Skills and Creativity, 41*, 100856. https://doi.org/10.1016/j.tsc.2021.100856

Benavides, C., & Ruíz, A. (2022). El pensamiento crítico en el ámbito educativo: una revisión sistemática. *Revista Innova Educación, 4*(2), 62–79. https://doi.org/10.35622/j.rie.2022.02.004

Brookfield, S. (2020). Teaching for critical thinking. *International Journal of Adult Education and Technology, 11*(3), 1–21. https://doi.org/10.4018/ijaet.2020070101

Cangalaya, L. (2020). Habilidades del pensamiento crítico en estudiantes universitarios a través de la investigación. *Desde el Sur, 12*(1), 141–153. https://doi.org/10.21142/DES-1201-2020-0009

Castañeda Fuentes, J. G., Pinto Ayala, B. E., & Sojos Tubay, A. M. (2024). Fomentando el pensamiento crítico mediante aprendizaje colaborativo y cooperativo: Estrategias para mejorar la enseñanza. *Revista Scientific, 9*(31), 126–143. https://doi.org/10.29394/scientific.issn.2542-2987.2024.9.31.6.126-143

Chávez Tantajulca, E. I. (2025). El pensamiento crítico y su importancia en la educación básica latinoamericana. *Revista de Ciencias Humanísticas y Sociales (ReHuSo), 10*(1), 10–21. https://doi.org/10.33936/rehuso.v10i1.6494

Díaz Parra, M. A. (2022). Desarrollo de habilidades en pensamiento crítico a partir de la propuesta de lectura minuciosa y escritura sustantiva en las clases de ciencias sociales. *Lenguaje, 50*(2), 458–484. https://doi.org/10.25100/lenguaje.v50i2s.11889

Elizalde García, A. A., Morales Holguín, A., & Aguilar Tobin, M. del C. (2022). La importancia del pensamiento crítico en la formación de los alumnos de diseño gráfico. *Zincografía, 6*(11), 210–227. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2448-84372022000100210

Fonseca, Y. L., & Castiblanco, O. L. (2020). Desarrollo del pensamiento crítico y reflexivo a partir de la enseñanza del sonido. *Tecné, Episteme y Didaxis: TED*, (47), 111–126. https://doi.org/10.17227/ted.num47-7841

Gómez-Gómez, M. P., & Botero-Bedoya, S. M. (2020). Apreciación del docente para contribuir al desarrollo del pensamiento crítico. *Revista Eleuthera, 22*(2), 15–30. https://doi.org/10.17151/eleu.2020.22.2.2

Latorre-Cosculluela, C., Vázquez-Toledo, S., Rodríguez-Martínez, A., & Liesa-Orús, M. (2020). Design thinking: Creatividad y pensamiento crítico en la universidad. *Revista Electrónica de Investigación Educativa, 22*, e28. https://doi.org/10.24320/redie.2020.22.e28.2917

López Mendoza, M., Moreno Moreno, E. M., Uyaguari Flores, J. F., & Barrera Mendoza, M. P. (2022). El desarrollo del pensamiento crítico en el aula: Testimonios de docentes ecuatorianos de excelencia. *Areté, Revista Digital del Doctorado en Educación, 8*(15), 161–180. https://doi.org/10.55560/arete.2022.15.8.8

Morales Bautista, M. L., & Díaz-Barriga Arceo, F. (2021). Pensamiento crítico a través de un caso de enseñanza: Una investigación de diseño educativo. *Sinéctica*, *Revista Electrónica de Educación*, (56), e1215. https://doi.org/10.31391/s2007-7033(2021)0056-016

Núñez-Lira, L. A., Gallardo Lucas, D. M., Aliaga-Pacore, A. A., & Diaz-Dumont, J. R. (2020). Estrategias didácticas en el desarrollo del pensamiento crítico en estudiantes de educación básica. *Eleuthera*, *22*(2), 31–50. https://doi.org/10.17151/eleu.2020.22.2.3

Rhodes, A., Wilson, A., & Rozell, T. (2020). Value of case-based learning within STEM courses: Is it the method or is it the student? *CBE—Life Sciences Education, 19*(3), 1–44. https://doi.org/10.1187/cbe.19-10-0200

Soto-Uriol, D. D., Duran-Llaro, K. L., Muñoz-Paz, V. A., & Pérez-Tavera, S. E. (2023). Enseñanza desde el pensamiento crítico: Un reto en la labor docente. *Revista Arbitrada Interdisciplinaria Koinonía, 8*(2), 252–268. https://doi.org/10.35381/r.k.v8i2.2875

Tasayco Jala, A. A., Menacho Vargas, I., Magallanes Yataco, E. M., & Ralli Magipo, L. G. (2024). El pensamiento crítico en la investigación de los estudiantes universitarios. *Aula Virtual, 5*(12), 789–816. https://doi.org/10.5281/zenodo.13199188

Velázquez-Tejeda, M. E., Cruzata-Martínez, A., Flores-Chirinos, J. O., & Jiménez-Chumacero, R. V. (2023). El pensamiento crítico: un reto de la enseñanza actual. *Revista Conrado*, *19*(91), 125–131. https://conrado.ucf.edu.cu/index.php/conrado/article/view/2930

Vendrell I Morancho, M., & Rodríguez Mantilla, J. M. (2020). Pensamiento crítico: Conceptualización y relevancia en el seno de la educación superior. *Revista de la Educación Superior, 49*(194), 9–25. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-27602020000200009

Wang, Y., & Wu, Z. (2023). Adapting or adopting? Critical thinking education in the East Asian cultural sphere: A systematic integrative review. *Thinking Skills and Creativity, 49*, 101330. https://doi.org/10.1016/j.tsc.2023.101330