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RECEIVED 24 November 2025
REVISED 29 January 2026
ACCEPTED 09 February 2026
PUBLISHED 07 April 2026

CITATION
Cisternas-Rojas Y, Jarpa-Azagra M,
Coiro-Díaz F, Salgado-Astudillo Y and
Collao-Donoso D (2026) Critical thinking
in initial teacher training: conceptual and
methodological tensions in the Chilean
context. *Front. Educ.* 11:1753208.
doi: 10.3389/feduc.2026.1753208

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Critical thinking in initial teacher training: conceptual and methodological tensions in the Chilean context

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Critical thinking is recognized as an essential skill in twenty-first-century teacher training, although there are still gaps in its conceptualization, implementation, and evaluation in education programs. This study explores how critical thinking is conceived and promoted in a teacher training program from the perspective of 120 students and 19 academics, using a mixed approach with a descriptive-exploratory *ex post facto* design, triangulating information obtained through questionnaires and discussion groups. The findings reveal conceptual discrepancies: students understand critical thinking as a skill, while academics conceive of it as a competency. Students perceive uneven development, in contrast to the more positive assessment of academics. Furthermore, variables such as age and year of entry into the program influences student assessment, unlike teaching experience. It is concluded that there is an urgent need to clarify conceptual frameworks, define more precisely the critical skills to encourage and align coherent pedagogical strategies. The main contribution lies in providing a solid empirical basis for guiding more consistent, contextualized training policies that are sensitive to the student voice, promoting reflective training that is committed to contemporary challenges.

KEYWORDS

critical thinking, higher education, instruction, teacher education, teaching methods

1 Introduction

Critical thinking (CT) has become established as a cross-cutting skill in teacher training, associated with informed judgement, decision-making, and citizen participation in democratic contexts (Facione, 1990, 2015; OECD, 2018; Paul and Elder, 2002). However, recent literature warns that CT is a contested construct, with heterogeneous definitions that are often insufficiently explained in the field of education, which makes its operationalization and evaluation in empirical studies difficult. In particular, there have been calls to move toward contextualized and culturally sensitive definitions of teacher CT, avoiding its reduction to exclusively normative frameworks or those detached from practice (Guamanga et al., 2023; Liao et al., 2025).

From an integrative perspective, CT can be understood as an intentional metacognitive process that articulates skills (e.g., analysis, inference, and evaluation), dispositions (open-mindedness, reason-seeking), and knowledge, aimed at making judgements and sustaining responsible decisions in real contexts, not just “criticizing” opinions

(Bailin and Battersby, 2016; Saiz, 2024; Garcia-Moro and Gomez-Baya, 2025). This understanding emphasizes that CT is not limited to the cognitive: its deployment is mediated by non-cognitive components—motivational, attitudinal and emotional—that condition when and how these skills are applied, an aspect that is particularly relevant in initial teacher training (Aydin, 2022; Saiz, 2024; Palma-Luengo et al., 2025).

In the field of initial teacher training, this approach positions CT as a resource for questioning beliefs, critically reading contextual demands and justifying pedagogical decisions, while also incorporating an ethical dimension that guides what to assess, why and with what educational consequences (Brookfield, 2012; Chrobak, 2017; Garcia-Moro and Gomez-Baya, 2025; Moreno-Pinado and Velázquez, 2017; Rivas and Saiz, 2023). In this way, CT is understood as a competence situated and oriented toward professional action, the teaching of which requires explicit “meta-education” to avoid simplified conceptualizations and facilitate its didactic translation into practice (Dwyer et al., 2025).

At the international level, recent research has identified significant gaps in the study of CT in initial teacher training. The bibliometric analysis by Aktoprak and Hurgun (2022) shows that, although there has been an increase in publications related to CT; most focus on undergraduate or technical students, with little representation of education students or teacher trainers. Studies such as that by Çelik (2021) confirm that teachers lack specific tools to integrate CT into their teaching practices, limiting its effective development in the classroom.

Furthermore, research conducted by Leibovitch et al. (2024) has highlighted the decisive role played by epistemological and pedagogical beliefs in the way future teachers understand and value CT. It is argued that these beliefs not only condition the way teachers approach CT, but also evolve in a non-linear way throughout their training, requiring processes of deep reflection during their educational trajectory. Furthermore, the study by Rodzalan and Saat (2015) provides evidence on how gender, academic discipline and educational environment significantly influence the perception and development of CT. This finding challenges the idea that CT develops homogeneously in university contexts and emphasizes the need to understand how it manifests itself in specific fields such as pedagogy.

As Aktoprak and Hurgun (2022) point out, there is an urgent need for further empirical studies on CT in teacher training in various national contexts, especially in regions such as Latin America, where the volume of publications remains low (Varela, 2019). Contributing to this gap is key to advancing the design of sustainable, culturally contextualized training program aimed at promoting reflective and transformative teaching at a global level (Valencia and Puente, 2018).

In the Chilean context, although CT has been declared a key competency in initial teacher training programmes [Law No. 20,903; National Education Council (CNED), 2021], there remains a gap between its presence in curriculum documents and its actual development in university classrooms (Ministry of Education of Chile, 2016). It is still unclear what teacher trainers and students understand by CT, what strategies promote it, and what personal and contextual variables influence its progression. This situation is not unique to Chile.

Given this scenario, this study aims to characterize how CT is conceived, valued, and developed in initial teacher training in a professional teacher training program at a Chilean university. To this end, the following research questions are addressed: What differences do academics and students express in their conceptualizations and assessments of CT in the specific context of initial teacher training? What teaching strategies do academics use to promote its development? How do the student’s age, year of entry into the program, and the academic’s years of teaching experience influence the assessment of CT development during initial teacher training? Based on these questions, the following specific objectives are proposed:

- (1) To analyze the conceptualizations and assessments that academics and students express regarding CT, both in general terms and within the context of initial teacher training;
- (2) To identify the teaching strategies used by academics to promote CT in future teachers;
- (3) To explore the influence of variables such as student age, year of entry into the program, and the academic’s years of teaching experience on the assessment of CT development during initial teacher training.

This study aims to generate empirical evidence situated in the local context, capable of revealing conceptual, methodological, and formative tensions that currently permeate the development of CT in teacher training. The purpose is not only to highlight these issues but also to place them at the center of the pedagogical discussion, providing relevant inputs for the improvement of training programmes consistent with local particularities. At the same time, the findings seek to engage in dialogue with the international debate on CT teaching in teacher training, thus contributing to the consolidation of a reflective, critical and contextualized professional culture in tune with contemporary educational challenges.

2 Materials and methods

2.1 Approach and design

This study adopts a sequential explanatory mixed-methods design (QUAN→QUAL) with a descriptive exploratory scope, situated within an interpretive paradigm. This choice is consistent with the research objectives, as it allows, in an initial quantitative phase, for the description of trends and differences in the conceptualization and assessment of critical thinking (CT) and the exploration of its association with variables such as age, year of entry and teaching experience; and, in a second qualitative phase, to explain and interpret the patterns identified, delving deeper into meanings, rationalities, and conditions of experience that helps to understand why these variations occur. In the established tradition of mixed methods, sequential explanatory design is justified when quantitative results need to be interpreted using qualitative evidence, articulating connections between phases (e.g., intentional selection of participants/cases based on QUAN

findings) and integration in interpretation to construct meta-inferences (Greene et al., 1989; Creswell and Plano Clark, 2018; Tashakkori and Teddlie, 2010; Fetters et al., 2013).

The research is non-experimental, *ex post facto* and retrospective, given that the phenomenon has already had an effect on the participants and no variables are manipulated; this approach provides ecological validity by being set in real conditions, although it requires caution in the interpretation of associations and avoids causal inferences (Bisquerra, 2019). Finally, the integration of quantitative and qualitative results aims to build more robust inferences through systematic comparison and convergence/divergence of findings, strengthening the interpretive credibility of the study (Fetters et al., 2013; Creswell and Plano Clark, 2018; Denzin and Lincoln, 2017).

2.2 Participants and sampling

The sample consisted of 120 students and 19 academics from the Primary Education Teaching program at a Chilean university. Intentional sampling aimed at maximum variation was used in order to capture a diversity of perspectives and experiences relevant to the phenomenon under study (Patton, 2015). The student sample included cohorts entering between 2019 and 2023, while the academic sample included participants with different levels of experience and teaching backgrounds.

In line with the sequential explanatory (QUAN→ QUAL) mixed methods design, the qualitative phase was implemented through two discussion groups segmented by type of participant: (i) a group of 10 students from different cohorts, and (ii) a group of 9 academics. This segmentation favors interaction between peers with comparable experiences within each group and allows for contrasting interpretations between groups, helping to explain the patterns observed in the quantitative phase (Creswell and Plano Clark, 2018; Ivankova et al., 2006). The adequacy of the qualitative sampling was evaluated using a criterion of thematic saturation/sufficiency of information, monitoring progressive redundancy and the stability of the category system during the analysis (Guest et al., 2006; Miles et al., 2014; Penfield and Giacobbi, 2004). Given the intentional sampling and interpretive focus of the study, statistical generalization is not sought; instead, the aim is analytical transferability/generalization, based on the explicitation of criteria and the contextual description of the case (Lincoln and Guba, 1985; Yin, 2018).

2.3 Instruments

A questionnaire adapted from the instrument designed by Bezanilla-Albisua et al. (2018) was applied, structured in four dimensions: (i) sociodemographic data (items 1 to 5); (ii) conceptualization of TC (item 6); (iii) assessment of CT in initial training (items 7 to 10) and (iv) teaching strategies (items 11 to 14). Two different versions were developed (for students and academics).

The instrument underwent content validation through expert judgement, with the participation of six specialists (four Chilean

and two Spanish) in pedagogy and teaching (Azwar, 2015). Aiken (1985) was used to assess the clarity, internal consistency, relevance, and adequacy of the items, achieving values above 0.90 in all four dimensions, which supports its validity. In addition, the internal reliability of the questionnaire was assessed in this application, obtaining an overall Cronbach's coefficient above 0.80, which is considered adequate for studies in education.

Complementarily, discussion groups were held with both groups of participants, in 60- and 90- min sessions with semi-structured scripts that addressed conceptualizations, formative experiences, and assessment of CT. This allowed for a deeper understanding of collective perceptions, enriching the qualitative analysis.

2.4 Procedure and data analysis

The operationalization of the design was carried out in three successive phases. In the first phase, the questionnaire was administered in digital format on an anonymous and voluntary basis, with prior informed consent. In the second phase, separate discussion groups were organized for students and academics, moderated through semi-structured scripts aimed at exploring conceptions and formative experiences of critical thinking (CT) in greater depth. These sessions, lasting between 60 and 90 min, were audio recorded and subsequently transcribed. Finally, in the third phase, the data were analyzed. All information was anonymized and stored in accordance with current ethical criteria in educational research. Qualitative analysis was managed using ATLAS.ti 23, which enabled the organization of the corpus, the development of a staged coding process, and the documentation of analytical decisions through memos and traceability reports. The procedure began with a familiarization reading and the definition of meaning units (segments of sense) as the basis for coding. An initial/open coding cycle was then conducted, combining descriptive and *in vivo* codes to capture emergent ideas. Subsequently, a focused coding cycle was carried out to group, refine, and hierarchize codes into thematic categories through constant comparison and iterative refinement of operational definitions. Category construction was guided by explicit criteria: recurrence of ideas, conceptual density (explanatory potential), internal coherence and differentiation between categories, and relevance to the research questions. To strengthen credibility and consistency, two researchers conducted parallel coding in ATLAS.ti and compared codes and categories until agreement was reached; discrepancies were resolved through analytic discussion and refinement of operational definitions. This process supported interpretative validity through internal triangulation by contrasting patterns between the student and academic groups and by linking qualitative insights to the quantitative results in the final integration of the sequential explanatory design (QUAN→ QUAL).

Quantitative data were analyzed using R v4.2.2 (R Core Team, 2022) through descriptive analyses (absolute frequencies, percentages, and means) and non-parametric tests: Chi-square tests for associations between categorical variables, Spearman's correlations for ordinal variables, and Student's *t*-tests to

compare perceptions between groups. The threshold for statistical significance was set at $p < 0.05$.

In this explanatory sequential design (QUANTITATIVE→QUALITATIVE), complementarity focused on objectives oriented toward meanings and experiences (conceptualization, assessment and strategies), while Objective 3 was addressed through quantitative descriptive–associative analyses due to its comparative nature.

3 Methodological strengths and limitations

The main strength of this study lies in the triangulation of methods and sources, which enriches the understanding of the phenomenon and lends ecological validity to the findings. Likewise, validation, of the instrument by international experts strengthens its rigor. However, the contextual nature of the study, restricted to a Chilean university, which is recognized as a limitation. Although the mixed design provided interpretative richness, no multivariate or longitudinal analyses were applied to explore the evolution of CT over.

3.1 Data availability and transparency

In compliance with the principles of open science promoted by EJIHPE, the instruments, anonymized data, and statistical analysis scripts used in this study are available for review and academic use.

4 Results

In this chapter, the results are first presented according to the themes that emerge from the specific objectives stated above.

4.1 Conceptualizations and assessments of CT by academics and students

With reference to the first objective of this study, we explore how students and academics conceive and value CT. The results show significant differences in the way academics and students

conceive of CT. While academics tended to define CT as a “competence” (42.11% closed-ended response item), students associated it more with a “capacity” (32.36% closed-ended response item) (see Table 1).

This contrast was confirmed by the Chi-square test (Table 2), with statistically significant differences in both groups ($p < 0.05$). Additionally, this test indicates that those who show a difference when defining CT are more likely to be academics than education students.

In turn, it can be observed that there is greater consistency between the students’ responses to the open-ended and closed-ended items: in both cases, they mainly identify CT as a skill. This consensus is not as clear among academics. Furthermore, in the case of students, the category “other” in the open-ended question accounts for the majority of responses, indicating the presence of conceptualizations that are not directly comparable with the closed options. This aspect is interesting to break down, as it reflects a broader or more situated understanding of CT that is difficult to capture using predefined categories. Example: “the ability to think for myself, to question what I am taught without accepting everything as truth” (student, cohort 2023).

The open-ended responses (Figure 1) collected in the study reveal a diverse understanding of CT, indicating the heterogeneity with which it is interpreted by students. From another perspective, a student in the 2022 cohort indicates that CT is “analyzing carefully and not repeating what the books say,” suggesting an analytical attitude toward established knowledge. Similarly, an academic with 15 years of experience, argues that “for me, CT is a professional skill that is built through reflection, not formulas.” This statement reflects a conception of CT as a situated professional competence, built through genuine reflective processes rather than through the mechanical application of standardized techniques. This view highlights the epistemic nature of CT linked to teacher judgement and contextualized analysis.

Another relevant aspect to mention is evident from the statement in the questionnaire, “Developing CT depends on the

TABLE 2 Difference in conceptualization using Chi-square.

Participants	Chi-square statistic	Degrees of freedom (df)	p-value
Academics	11.03	3	0.01159
Students	29.48	3	2.10-6

TABLE 1 Conceptualization of CT by academics and students.

Open-ended response*	Frequency		Percentage (%)		Closed response*	Frequency		Percentage (%)	
	ACAD	STUD	ACAD	STUD		ACAD	STUD	ACAD	STUD
Capacity	8	21	40	33.33	Capacity	2	22	10.53	32.36
Skill	4	6	20	9.53	Skill	6	18	31.58	26.48
Competence	1	2	5	3.18	Competence	8	17	42.11	25
Other	7	34	35	53.97	Other	3	11	15.79	16.18

*Open-ended response refers to an item that allows respondents to express themselves freely in writing; closed-ended response refers to an item with limited response options. ACAD, academics; STUD, students.



FIGURE 1 Word cloud related to other conceptualizations of CT based on frequency of mention. Own elaboration.

TABLE 3 Distribution of opinions regarding the relationship between CT and disciplinary area of knowledge.

Statistic	Academics		Students	
	Agree	Disagree	Agree	Disagree
Frequency	4	15	23	45
Percentage (%)	21.1	78.9	33.82	66.18
Standard deviation	5.5		11	

area of disciplinary knowledge to which the subject I teach belongs,” which was common to both groups and whose results are shown in Table 3.

The table above shows that the data dispersion is twice as high among students as among academics; however, both groups agree that the association between CT and the area of disciplinary knowledge is not relevant. In fact, according to the analysis performed with the Chi-square test ($\chi^2 = 0.614, p = 0.433, df = 1$), there are no statistically significant differences between the distributions of responses from teachers and students, suggesting that both groups tend to respond similarly. This is viewed positively, as it is consistent with the future role of students: they will work as primary school teachers who must engage with more than one field as part of their professional practice. Thus, the conviction that developing CT is not linked to a particular disciplinary area of knowledge suggests that this competence is addressed across disciplines.

Finally, when analyzing the applied assessment of CT, three areas of interest were found among the group of academics: the possibility of developing CT in the subject they are teaching in the current semester (A1) and the possibility of developing CT in the general teacher training program (A2). These were presented as elements to be assessed on a scale of 1–10, with 10 being the maximum value. The results are detailed in Table 4.

The variability of the academics’ responses was calculated using the coefficient of variation, which was 11.73% for A1 and 12.52%

TABLE 4 Assessment of the degree of CT development among academics.

Area	Average store	Standard deviation
A1	9.21	1.08
A2	9.26	1.16

TABLE 5 Assessment of the degree of CT development in students.

Area	Average score	Standard deviation
A3	7.03	2.21
A4	7.46	2.42

for A2. Both results are below 15%, indicating a high degree of homogeneity in the assessments and, therefore, low dispersion in the responses of the academic group.

In relation to the students, the areas explored were: assessment of the degree of CT development since entering the degree programme (A3) and assessment of the possibility of developing CT with the subjects currently being studied (A4). The results are presented in Table 5.

In both cases, the students’ assessments are quite similar; however, the responses show high variability. To confirm this, the coefficient of variation was calculated, which is greater than 30% in both cases (A3 = 32.43% and A4 = 31.44%), categorically establishing the non-homogeneity of the assessments.

To verify whether these differences in assessments are statistically significant, a Student’s *t*-test was applied, comparing the responses of academics and students in equivalent areas:

- Development of CT in current subjects: academics perceive the possibility of developing CT in their subjects as significantly higher (9.21) than students (7.46), yielding a value of $p = 9.14 \cdot 10^{-8}$.
- Development of CT at the programme level: similarly, academics give a higher perception (9.26) of the potential

of the training program to develop CT, compared to the group of students (7.03). The p -value refers to $p = 6.36 \cdot 10^{-8}$.

These statistically significant differences ($p < 0.001$) reveal an important perceptual gap: while academics show high confidence and optimism about the possibilities of developing CT at both the subject and program levels, students perceive a lower degree of development. This disparity suggests the need to review pedagogical strategies to align teacher expectations with the actual student experience.

This difference was also evident in the narratives: one academic stated, “*I do believe that CT can be worked on, but it is not enough to say so in the learning outcomes; we must teach critical thinking from the planning stage*”; while one student commented, “*Sometimes I feel that what we do in class is repeat things, and I don’t know if that is critical thinking*.”

4.2 Teaching strategies used by academics to promote CT

Likewise, the type of strategies used by academics is mainly problem-based learning (22.2%, see Table 6), which reinforces the idea that CT is worked on through experience and meaningful problem solving for future teachers. These findings are consistent with recent research on the effectiveness of active methodologies for the development of CT (Casado Fernández and Checa-Romero, 2022).

The category “other,” shown in Table 6, includes isolated actions that were not classified under any criterion; however, given the research team’s interest, they are indicated in Figure 2.

Another aspect that emerges from this item refers to the type of cases that academics use to frame their strategies. These were categorized into two groups: real cases and simulated cases. The former refer to experiences that come from direct experiences, both of students and academics. The latter are fictional situations proposed from texts, news items or the teacher’s own elaboration in order to achieve certain learning objectives. The frequencies of use for both are detailed in Table 7.

These results show that most academics prioritize the analysis of real cases, most of which are not worked on within a specific methodology. This idea coincides with the importance currently given to the assessment of real problems in the development of CT, as proposed by Sarnoko et al. (2024) and Küçük et al. (2023).

TABLE 6 Teaching strategies used by academics.

Strategy used	Frequency	Percentage
Problem-based learning	4	22.2
Action research	1	5.5
Flipped classroom	2	11.1
Other	11	61.1

4.3 Influence of variables related to student age, year of entry, and academic teaching experience (expressed in years) in CT development

For the third objective, the association between individual and formative variables and the assessment of critical thinking (CT) development during initial teacher training was explored. In students, a moderate positive correlation was observed between age and assessment of CT development ($\rho = 0.4505$; $p = 0.0028$), indicating that, in this sample, older students tend to report a higher assessment. Likewise, the year of entry was positively and moderately associated with the assessment of CT development ($\rho = 0.3581$; $p = 0.0027$), suggesting that those who entered more recently report higher assessments compared to previous cohorts.

In contrast, in the group of academics, there was no statistically significant association between years of teaching experience and the assessment of opportunities to promote CT in their subjects ($\rho = -0.22$; $p = 0.37$). Taken together, these results should be interpreted as associative trends typical of an ex post facto design, without implying causal relationships.

In summary, students and academics highly value the development of CT, although there are differences. are observed in its conceptualization and in the degree of systematization of teaching strategies to promote it. In this context, quantitative analysis suggests that age and year of entry are associated with students’ assessment of CT development, while academic teaching experience shows no significant association, raising questions about the institutional and pedagogical conditions that favor its promotion.

Finally, Figure 3 summarizes the study’s most important findings, which we will discuss later.

5 Discussion

The findings of this study, situated from an interpretive perspective with a constructivist approach, reveal contrasting findings between the views of academics and students, specifically regarding the conceptualization, assessment, and implementation of CT in initial teacher training. This dichotomy not only reveals cracks in current conceptual frameworks, but also directly challenges curriculum designs, challenging training institutions to rethink their pedagogical models in line with the demands of the 21st century. As Giroux and McLaren (1989) warn, reducing CT to a set of decontextualized skills can depoliticize educational practice and limit its transformative potential; conversely, conceiving it as a praxis implies training teachers who are capable of questioning structures, resisting injustices and constructing situated knowledge.

This epistemological tension is expressed not only at the discursive level, but also in educational practice, particularly in the discrepancy between the high value placed on CT and the way in which it is defined and operationalized. A key finding is the coexistence of a strong declarative consensus on its importance with an unstable conceptualization: open and closed responses show semantic heterogeneity and an absence of a shared core,



FIGURE 2
Other teaching actions used by academics to promote CT. Own elaboration.

TABLE 7 Types of cases to be worked on in class.

Types of cases to be worked on in class	Percentage (%)	Frequency
Real case	55.5	10
Simulated case	22.2	4
Not mentioned	22.2	4

leading to curricular ambiguity regarding what is taught, how it is promoted, and what is assessed.

This misalignment is consistent with recent reviews that warn that when CT is not precisely defined, the coherence between construct, measurement, and assessment in teacher studies is weakened (Liao et al., 2025). In particular, while academics tend to refer to CT as a “competence,” students describe it as a “capacity” or as a broad process without defined contours. More than a terminological problem, this dispersion highlights the absence of a common epistemological framework, which hinders its teaching, assessment and progression (Hurrell, 2021).

Furthermore, contemporary approaches emphasize that CT requires the explicit articulation of skills, dispositions and metacognition; when this articulation is not made explicit, assessment tends to remain at a declarative level without systematic translation into training practices (Saiz, 2024).

This result is consistent with Ennis’s (2018) warnings about the risks of defining critical thinking in abstract or exclusively normative terms, without anchoring it in concrete training practices and a shared didactic understanding (Ross and Gautreaux, 2018). In this sample, our findings suggest that disagreement is not limited to the theoretical level, but also manifests itself at the training level: differences in how academics and students conceptualize critical thinking are associated with divergent expectations about its development and with less stable criteria to guide its teaching and assessment during initial training. Consequently, rather than affirming direct effects in the classroom, these results raise the need to strengthen conceptual and didactic

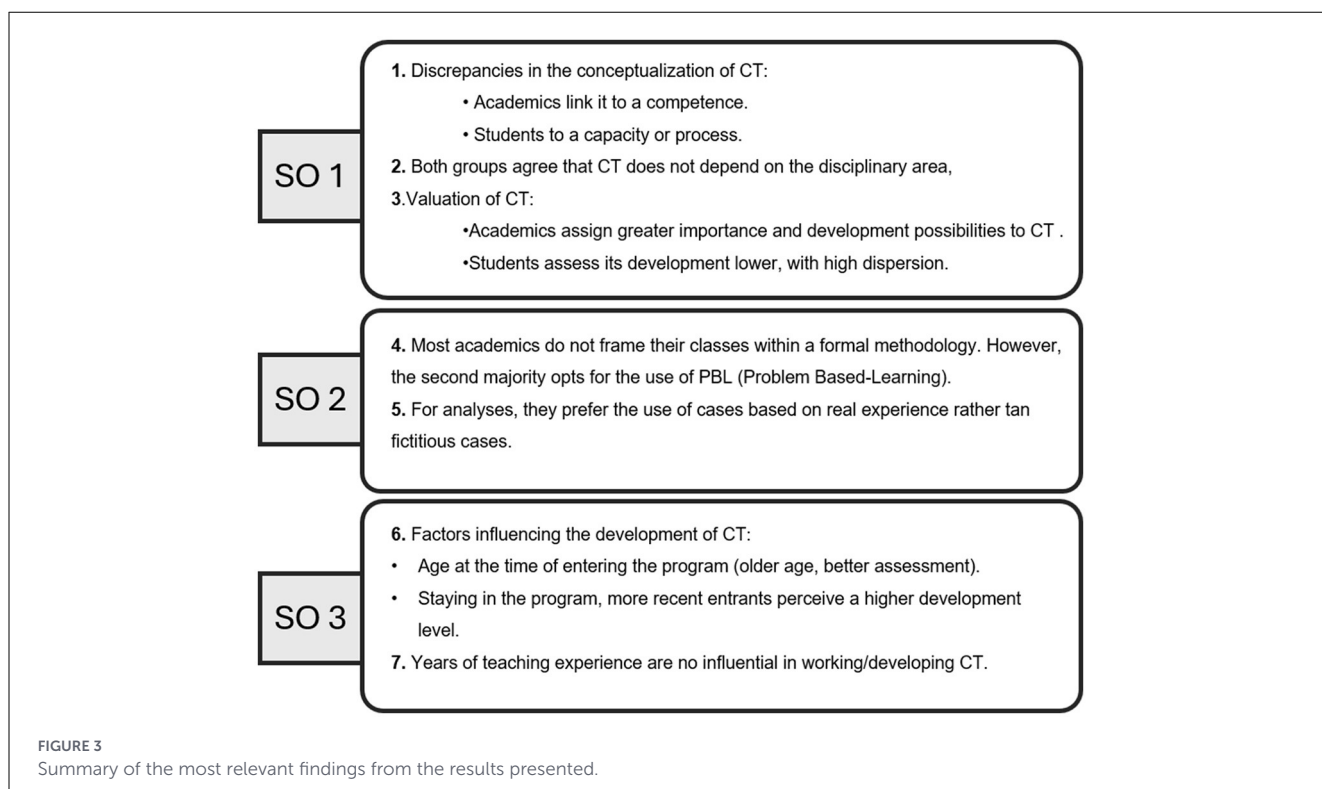
agreements that allow for a more consistent implementation of critical thinking in the curriculum.

From a methodological perspective, the results show a positive trend toward the incorporation of active methodologies—such as real-case analysis and problem-based learning (PBL)—to promote CT. This choice is consistent with the evidence presented by Chen et al. (2023) and Sarnoko et al. (2024), who highlight the effectiveness of PBL in promoting reflective, analytical, and argumentative skills (Quintero et al., 2017).

However, when contrasting this pedagogical intention with student assessment, cracks in the educational experience emerges. Students do not always recognize these strategies as opportunities for critical thinking, suggesting a disconnect between instructional design and their classroom experience. The findings of this group are in line with those of Loaiza et al. (2025), who indicate that despite the recognition of CT as a cross-cutting theme, its integration into teacher training is often marked by a lack of conceptual and methodological systematization, which implies a difficulty in implementation and consistency in pedagogical practice.

Additionally, the quasi-experimental study conducted by Saiz and Rivas (2023) expands on this observation by showing that active methodologies alone do not guarantee the development of CT. Their research shows that intentional, sustained and explicitly mediated implementation is necessary for these strategies to have a real impact on skills such as logical reasoning, argumentation and decision-making.

This phenomenon can be interpreted as a didactic misalignment, in which the strategy exists formally but lacks reflective mediation, explicit objectives, or critical feedback. As Bezanilla-Albisua et al. (2018) warn, when CT is not worked on in a visible, cross-curricular, and progressive manner, it can lead to ‘educational disaffection’: students perceive inconsistency between what is stated to be taught and what is actually learned. In this study, the phenomenon is more pronounced among older students, who report a lower assessment of CT development, suggesting that the curriculum fails to sustain the critical approach throughout the program.



Added to this is a finding that transcends the Chilean case: the absence of a coordinated institutional approach to CT. Although some academics promote meaningful experiences, these seem to respond more to individual initiatives than to a coherent educational policy. This finding coincides with that of [Drayton \(2014\)](#) and [Leibovitch et al. \(2024\)](#), who argue that the development of CT in educational contexts requires not only strategies but also institutional conditions: continuous teacher training, spaces for pedagogical dialogue, appropriate assessment frameworks and committed academic leadership.

The analysis also reveals contextual elements that influence students' assessments, identifying positive correlations between age or year of entry and the development of CT. This finding can be explained from a sociocultural perspective: more recent students have been trained in a university environment that is more exposed to the discourse of transversal competences, which could explain their greater critical awareness. However, it is also possible that those who have been in the program longer have experienced a discontinuity in their training, leading to a gradual loss of understanding of the real value of CT in their educational process. This study provides situated evidence on how critical thinking is conceived and promoted in initial teacher training in a Latin American context, where empirical studies on its implementation remain comparatively scarce, as suggested by recent analyses of trends and gaps in the literature ([Aktoprak and Hurgun, 2022](#)). In theoretical terms, the findings dialogue with contemporary perspectives that warn that the debate is no longer limited to defining critical thinking as a set of skills, but rather incorporates notions of criticality/critical being, emphasizing its practical, ethical and contextual dimensions ([Dunne, 2015](#); [Barnett/Davies, 2015](#); recent developments). Likewise, current approaches emphasize

that its deployment depends on the articulation between skills, metacognition and dispositions/motivation, which is consistent with the gap observed between high declared value and unstable operationalization in training ([Ossa Cornejo and Mena Ruiz-Tagle, 2023](#)). Taken together, these results do not aim at statistical generalization, but they do contribute to clarifying the conditions for moving toward conceptual and didactic agreements that guide diagnoses and curricular improvements with greater consistency.

Finally, although this study offers a comprehensive approach to the conceptual and methodological tensions surrounding CT in initial teacher training, it has some limitations that should be considered when interpreting the findings. First, the intentional nature of the sample, which is limited to a single Chilean university, restricts the generalization of the results to other training contexts. Furthermore, although a mixed design was used, no multivariate or longitudinal analyses were developed to explore the evolution of CT throughout the training program. These limitations highlight the need for future comparative and inter-institutional research to broaden our understanding of the phenomenon from approaches that take into account the diverse realities of education.

6 Conclusions

The purpose of this study was to understand how CT is developed in initial teacher training, based on the assessments of academics and students at a Chilean university. The findings reveal three central aspects. First, both groups highly value CT, confirming its recognition as a key competence in training. Second, conceptual, methodological, and experiential tensions emerge that

hinder its effective integration into the curriculum, highlighting the dissonance between what academics declare and what students experience. Third, there is a diversity of understandings of CT and a lack of a coordinated institutional approach that positions it transversally in the training program.

The results imply the need to move toward coherent and sustained training strategies that include shared definitions, contextualized pedagogical practices, and relevant assessment mechanisms. It is also proposed to strengthen university teacher training and to promote spaces for academic dialogue that favor a situated appropriation of CT.

In short, this work contributes to the debate on teacher training from a critical and comprehensive perspective, reinforcing the need to establish CT as a structuring axis of teacher training trajectories.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

Author contributions

YC-R: Writing – review & editing, Writing – original draft. MJ-A: Writing – review & editing. FC-D: Data curation, Writing – original draft, Conceptualization. YS-A: Writing – review & editing, Data curation, Investigation. DC-D: Writing – review & editing.

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Funding

The author(s) declared that financial support was received for this work and/or its publication. This research was funded by ANID, Chile.

Acknowledgments

We would like to thank the National Agency for Research and Development (ANID), Chile (Project FONDECYT 11230230).

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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