




“This makes me feel good”: Professional learning communities as a space for interpersonal emotion regulation among science teachers

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ABSTRACT

Teachers' interpersonal emotion regulation refers to the processes through which teachers manage both their own emotions and those of colleagues in ways that shape teacher well-being, student well-being, and student learning outcomes. Professional Learning Communities (PLCs) are collaborative spaces that can provide emotional support, reduce professional isolation, and enhance job satisfaction, yet the mechanisms through which they achieve this remain insufficiently understood. This study examined how participation in a PLC contributes to the interpersonal emotion regulation of Chilean science teachers. A qualitative interpretative methodology was employed, combining thematic and narrative analysis of five PLC sessions in which teachers shared pedagogical experiences and reflected on emotions and practices. The analysis identified several interpersonal emotion regulation strategies, including labeling, receptive listening, valuing, safety signals, and cognitive reappraisal. The findings underscore the importance of examining the emotional dimensions of teaching, particularly in Latin America, where working conditions require the integration of emotional education into pre-service and in-service teacher training, thereby strengthening relationships, collective agency, and professional development in unstable contexts.

1. Introduction

IER (Interpersonal Emotion Regulation) refers to the processes by which individuals regulate their own and others' emotions through social interaction (Liddell & Williams, 2019; Wang & Wang, 2023; Xiao & Tian, 2023). For teachers, this concept encompasses strategies used not only to manage their own emotions but also to influence the emotions of students and colleagues within the educational environment.

In teacher–student interactions, emotions and their regulation are crucial, as they affect teaching effectiveness and student motivation (Aldrup et al., 2024; Frenzel et al., 2021; Taxer & Gross, 2018; Uzuntiryaki-Kondakci et al., 2022), with implications for

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well-being and the quality of social relationships (Gómez-Rivera & Acosta-Silva, 2021; Xiao & Tian, 2023). Positive teacher emotions are often associated with more student-centered practices that foster motivation (Uzuntiryaki-Kondakci et al., 2022). By contrast, negative teacher emotions are linked to transmissive approaches that undermine student well-being and motivation (Frenzel et al., 2021; Uzuntiryaki-Kondakci et al., 2022).

Although research has largely examined IER processes in classrooms, particularly between teachers and students, IER among colleagues also plays an important role in teacher well-being and emotional learning. In this regard, Professional Learning Communities (PLCs), defined as groups of teachers who share and critically interrogate their practices to improve student learning, have been described as valuable spaces for collaboration and reflection, as well as environments that provide teachers with emotional support (González-Weil et al., 2025).

This study seeks to examine how participation in a PLC contributes to the IER of science teachers. The PLC under analysis corresponds to the PRETeC community [Profesores Reflexionando por una Educación Transformadora en Ciencias; Teachers Reflecting for a Transformational Science Education in English], a group of Chilean science teachers (González-Weil et al., 2025; Torres-Olave & Bravo González, 2021) with 15 years of activity. PRETeC meets periodically to analyze teaching practices. The present study focuses on PRETeC sessions held between 2020 and April 2022, a period marked by an additional emotional burden due to the pandemic and post-pandemic context, as well as the political processes in Chile at that time (the social outbreak and constituent process), which disrupted the educational system and intensified feelings of vulnerability (Jiménez-Yañez, 2020; Quiroz Reyes, 2020). The study addresses three specific research questions: (a) What emotions do teachers express during PRETeC sessions? (b) What situations are these emotions related to? (c) How does the group deploy IER strategies during the sessions?

The article is organized as follows. Section 2 reviews the literature on teacher emotion regulation, with particular attention to IER and the role of PLCs in supporting it. Section 3 outlines the methodology. Section 4 presents the results in two parts: the first examines the emotions expressed during the sessions and the situations that elicited them; the second explores how different IER strategies were employed, illustrated through three selected episodes. Section 5 discusses the findings, highlighting the positive impact of PLCs on teacher well-being and advocating for the inclusion of emotional education in both initial and ongoing teacher training, particularly through active participation in learning communities. Section 6 presents the conclusions of the study.

2. Theoretical background

The following section outlines the theoretical framework on teachers' emotions, emphasizing IER and examining how PLCs may foster its development and practice.

2.1. Teacher emotions

Emotions are complex phenomena comprising affective, expressive, physiological, motivational, and cognitive elements, which interact in coherent patterns (Frenzel et al., 2021; Muehlbacher & Hagenauer, 2023; Scherer, 2005). They emerge from subjective evaluations of significant external or internal stimuli, shaped by personal and social experiences (Büssing et al., 2020; Mellado et al., 2014; Scherer, 2005; Schutz et al., 2006). Thus, it is the appraisal of events, rather than the events themselves, that elicits emotions (Frenzel et al., 2020; Scherer, 2005). Acquiring new information may lead to a re-evaluation of a situation, producing rapid emotional changes (Scherer, 2005). In this sense, emotions act as intermediaries between individuals and their environment, influencing responses to social events.

Teacher emotions are those experienced within the professional context and significantly affect both student learning and teacher well-being (Frenzel et al., 2021). They form an integral part of socio-cognitive development and are shaped by cultural, ethical, historical, and institutional contexts, constituting a fundamental dimension of how teachers relate to and interact with students, colleagues, and parents (Chen, 2021). Positive emotions are generally linked to higher student motivation and achievement, as well as greater teacher effectiveness, enthusiasm, and well-being. By contrast, negative emotions such as worry or anger are associated with disruptive behavior, anxiety, lower student achievement, burnout, and teacher demotivation (Chen, 2021; Frenzel et al., 2021; Uzuntiryaki-Kondakci et al., 2022).

A variety of factors influence teachers' emotions, including personal characteristics such as personality, beliefs, knowledge, and values, as well as contextual elements related to sociocultural, organizational, and educational policy factors (Chen, 2021). Teachers' appraisals of their own performance, classroom discipline, student motivation, and relationships with learners are also significant (Frenzel et al., 2020). In addition, emotional abilities, including emotional intelligence and emotion regulation, strongly affect teachers' emotional states, with consequences for burnout and job satisfaction (Chen, 2021). For science teachers in particular, emotions are also shaped by their evaluation of the specific topic to be taught (Uzuntiryaki-Kondakci et al., 2022). For instance, among biology teacher trainees, expectations of enjoyment increase when the topic is perceived as personally relevant (Büssing et al., 2020).

Further research indicates that the use of socio-scientific issues (Retana-Alvarado et al., 2018) or scientific inquiry (Bravo Lucas et al., 2022) can foster positive emotions and reduce negative ones among pre-service and primary teachers. These approaches may help counteract the adverse effects of negative emotions that lead future educators to disengage from science, often as a result of traditional teaching methods experienced during their own schooling (Retana-Alvarado et al., 2018). While these studies illuminate the role of emotions in science education, more empirical evidence is required on how teachers experience emotions in relation to science teaching and how these experiences shape their pedagogical practices (Allaire et al., 2024).

2.2. Emotion regulation

Emotion regulation refers to the processes by which individuals influence which emotions they experience, when they experience them, and how these emotions are expressed (Taxer & Gross, 2018; Xiao & Tian, 2023). Given the strong impact of teaching-related emotions on both student and teacher well-being, the regulation of emotions is particularly relevant in educational contexts. Effective regulation enables teachers to manage their behaviors, strengthen classroom commitment, decrease negative emotions, and enhance positive ones, depending on situational demands and instructional goals (Muñoz-Troncoso et al., 2024; Uzuntiryaki-Kondakci et al., 2022). From this perspective, emotion regulation can be considered a moderator of the links between teachers' emotions and student outcomes (Frenzel et al., 2021).

Although research in this area remains incipient (Xiao & Tian, 2023), several strategies of teacher emotion regulation have been identified. According to Gross's process model of emotion regulation (Gross & Thompson, 2007; Taxer & Gross, 2018), teachers employ five broad families of strategies: *situation selection*, *situation modification*, *attentional deployment*, *cognitive change*, and *response modulation*. The first four occur prior to the full development of emotional experience, whereas the last operates afterward. Additional strategies such as *acceptance* and *problem-solving* have been shown to promote positive emotions and reduce stress. By contrast, *suppression*, *ruminantion*, and *avoidance* tend to sustain negative emotional states such as anxiety and depression (Xiao & Tian, 2023).

2.3. Interpersonal emotion regulation (IER)

Interpersonal Emotion Regulation (IER) refers to the processes by which individuals influence the emotions of others (Xiao & Tian, 2023) or regulate their own emotions through social interaction (Zaki, 2020). Depending on the regulatory goal, IER may be *intrinsic*, when an individual initiates social contact to regulate his or her own experience; or *extrinsic* when one attempts to regulate the emotions of another (Xiao & Tian, 2023). Extrinsic interpersonal regulation remains the least explored dimension in current research (Double et al., 2024).

A range of IER strategies has been identified in the literature. One intrinsic strategy is *labeling*, which involves articulating and naming one's emotional states without requiring a response from others. Labeling facilitates recognition and appraisal of affective experiences, thereby clarifying their causes and supporting more effective coping (Zaki & Williams, 2013). Through this process, emotional memories are verbalized and transformed, reducing their affective intensity (Gómez-Rivera & Acosta-Silva, 2021). Another intrinsic strategy, dependent on others' responses, is the provision of social support as *safety signals*, whereby affiliation demonstrates that one is not alone in the face of adversity, promoting a less threatening reinterpretation of events and more adaptive emotional responses (Zaki & Williams, 2013).

Regarding extrinsic IER, Double et al. (2024) map several strategies across studies, many of which align with Gross's process model of emotion regulation. Although initially designed to describe intrinsic strategies, the model is also applicable to extrinsic regulation (Nozaki & Mikolajczak, 2023). Examples include *cognitive reframing* or *reappraisal* (*cognitive change*), where individuals are encouraged to modify their interpretation of a situation to alter its emotional impact (Double et al., 2024; Nozaki & Mikolajczak, 2023). *Receptive listening* or *empathetic responding* (*response modulation*) involves encouraging individuals to articulate their emotions while receiving empathy in return (Nozaki & Mikolajczak, 2023). Related to *attentional deployment*, strategies such as *valuing* – demonstrating attentiveness so that the individual feels acknowledged – *distraction*, encouraging engagement in alternative activities, and *humor*, using jokes to improve mood, have been documented (Double et al., 2024). Finally, strategies related to *situation modification* include *problem-solving* or *direct action*, where advice or solutions are offered to help alter the emotional situation (Double et al., 2024).

Across these cases, IER strategies enable individuals to recover emotionally while reinforcing social bonds among those involved (Gómez-Rivera & Acosta-Silva, 2021). These processes illustrate that emotion regulation is inherently relational rather than exclusively individualistic.

Conditions that foster IER include friendship and trust, which promote authenticity in the expression of emotions and coherence between behaviors, attitudes, and beliefs. Trust provides security and reassurance, reducing the risk of harm or exploitation, and consolidating bonds of friendship (Gómez-Rivera & Acosta-Silva, 2021).

IER in teachers has been studied primarily in contexts such as the United States, South Korea, China, the United Kingdom, and Iran (Byun & Jeon, 2023; Greenier et al., 2021; Han et al., 2020). In contrast, Gómez-Rivera and Acosta-Silva (2021) identify a gap in research in Latin America, emphasizing the need for studies that generate evidence relevant to local contexts and that can inform public policy and teacher education.

2.4. Emotion regulation and professional learning communities

Professional Learning Communities (PLCs) are generally defined as groups of teachers who share a common goal and collective responsibility for improving student learning (Liu et al., 2025). They are recognized as valuable spaces for collaboration and reflection, capable of fostering both pedagogical transformation (González-Weil et al., 2025) and changes in teachers' efficacy beliefs (Liu et al., 2025).

PLCs have also been described as spaces that provide emotional support by creating safe and trusting environments in which participants can freely express emotions (González-Weil et al., 2025; Vangrieken et al., 2017). Research has further identified links between PLC participation, professional identity, and resilience (Zhang et al., 2024). By reducing professional isolation and offering collegial guidance, PLCs can strengthen teacher motivation, job satisfaction, and self-efficacy (Ohayon & Albulescu, 2023; Pan & Cheng, 2023; Zhang et al., 2024).

An illustrative example is Wu et al.'s (2025) study in China, which examined four language teacher trainees participating in a virtual community of practice. Through collaborative engagement, collective reflection, and mutual support, participants reframed difficulties as opportunities for growth and developed skills to manage emotional challenges, thereby enhancing their teaching practices. The authors suggest that participation in a PLC promotes emotional regulation as a core professional competence. Nonetheless, other studies indicate that PLC participation may also generate tensions and negative emotions, particularly when teachers encounter institutional pressures or lack of support that impede the implementation of PLC-inspired innovations (Schaap et al., 2019), or when participation is mandatory (Zheng et al., 2021).

In the Chilean context, since 2016 Law 20.903 has required schools to establish *Local Training Plans for Teacher Professional Development*, which include feedback on teaching practices and collaborative strategies such as PLCs (CPEIP, n.d.). In science education, the ICEC (Scientific Inquiry for Science Education) Program has promoted the creation of inter-school PLCs since 2015 (Hernández Lémann & Caffi Pizarro, 2020). However, its reach remains limited, covering less than 3 % of the national teaching workforce.

Considering all Chilean teachers, regardless of subject area, a report by the United Nations Development Program (UNDP, 2023) indicates that between 2017 and 2021 only 12 % reported participating in a PLC. Beyond descriptions of specific experiences, however, there is limited evidence regarding the characteristics of these PLCs or their impact on professional development. Activities associated with local training plans tend to emphasize vertical actions, in which management teams train teachers or hire external consultants, rather than fostering peer-led collaborative spaces (UNDP, 2023).

Research on PLCs in Chile has largely addressed structural and pedagogical dimensions such as collaboration, distributed leadership, and stages of institutional development (Cabezas et al., 2021). Some studies highlight innovative territorial initiatives in science education, particularly those developed in southern Chile under the ICEC Program (Leiva et al., 2020). Yet these accounts seldom address emotional dimensions and rarely consider IER as a constituent element of teacher professional development. Guerra et al. (2024), in a study with early childhood educators, show that PLCs can function as spaces promoting professional well-being through self-care practices, emotional support, and affective bonds that foster pedagogical reflection and strengthen agency. Nevertheless, the concept of IER as a specific process of managing peer emotions remains absent. Local studies also reveal that the consolidation of collaborative spaces such as PLCs is hindered by structural mistrust, individualism, and competition within the Chilean education system (Aparicio Molina & Sepúlveda López, 2018), with the PLC analyzed in this article representing an exception rather than the rule (González-Weil et al., 2025).

In the global context, although PLCs are widely recognized as safe environments for emotional exchange, research has largely focused on perceived emotional support rather than on the specific mechanisms of IER within these communities (Beddoes et al., 2023; Guerra et al., 2024). Moreover, most existing studies on emotion regulation emphasize individual strategies, leaving collaborative approaches to emotional management largely unexplored (Gkonou & Miller, 2023).

In summary, while PLCs are acknowledged for supporting pedagogical change and enhancing teaching practices, further progress is required in understanding their specific effects on teachers' emotional well-being, the mediating mechanisms at play, and the contextual conditions that shape these outcomes (Hairon et al., 2017; Liang et al., 2022; Owen, 2016).

3. Methods

This study employed a qualitative interpretative approach to examine how participation in a PLC contributes to IER among science teachers. The analysis focused on identifying the emotions expressed by teachers, the situations in which these emotions emerged, and the collective strategies deployed for their regulation within the collaborative space.

3.1. Context

The study centers on the PRETeC community, active since 2010 and composed of science teachers at both school and university levels. The community meets periodically in hybrid sessions to share pedagogical experiences, known as *lesson stories* (Acuña et al., 2016), with a focus on critical reflection on teaching practice. Until 2019, meetings were held exclusively in person; during the pandemic (2020–2021) they shifted entirely online, and since mid-2022 they have adopted a hybrid format. The period analyzed corresponds to the fully virtual stage, during which the group systematically recorded the sessions.

The corpus for analysis comprised five sessions conducted between June 2020 and June 2022, most of them occurring in the context of emergency remote teaching due to the COVID-19 pandemic. These sessions were selected from a larger set of nine that included complete audiovisual recordings and accompanying written lesson stories. The five sessions chosen specifically narrated situations situated in school contexts. Each session lasted 1.5 to 2 hours (8.5 hours in total) and involved between five and 13 in-service science teachers. All sessions were recorded with informed consent and subsequently transcribed.

3.2. Participants

Participants were the teachers present in the selected sessions. Two of the three authors of this article also took part in those meetings, having been members of the community since 2010 and 2020, respectively. Accordingly, participants were not recruited for the study but were those who naturally attended the selected sessions. In total, 21 teachers participated: five physics teachers, 11 biology teachers, and five chemistry teachers, comprising eight women and 13 men. Eight participants had been members since the group's inception in 2010, while others joined in subsequent years, with the most recent member entering in 2021. To preserve

confidentiality, all names appearing in this article are pseudonyms assigned by the research team.

3.3. Data analysis

The analysis followed thematic analysis (Braun & Clarke, 2006), a flexible and systematic approach for identifying, organizing, and interpreting patterns of meaning in qualitative data. This method considers both explicit content and latent meaning in discourse, facilitating an understanding of how emotional experiences are constructed and communicated in specific social contexts. Atlas.ti software (version 25) supported the process, enabling systematic coding and the construction of emerging categories.

3.3.1. First stage: transcription, segmentation, and emotion/situation coding

Audiovisual recordings were fully transcribed and segmented into analytic paragraphs of approximately 6–10 lines, each delimited by the specific classroom-related situation narrated. This paragraph served as the unit of analysis. For each paragraph, we first determined whether an emotion was expressed in relation to the situation. When emotions were present, the entire paragraph was coded, allowing more than one distinct emotion to be linked to the same segment, while multiple mentions of the same emotion within a paragraph were counted as a single occurrence. Emotions were categorized according to Scherer's taxonomy of affect categories and word stems (2005, pp. 714–715). For example, "Anxiety/Anguish" was identified through stems such as *anxi*, *apprehens*, *jitter*, *nervous*, *trepida*, *wari*, *wary*, *worried*, *worry*; "Tension/Stress" through stems such as *activ*, *agit*, *discomfort*, *distress*, *strain*, *stress*, *tense*, and so on. The frequency of each emotion was calculated as the number of paragraphs in which it appeared across the five sessions. Once coded for type and frequency, emotions were grouped by overall valence (positive/negative), and distributions were compiled.

Following Jaspal et al. (2016), the contexts in which these emotions emerged were also categorized across three analytical levels – Micro, Meso, and Macro – defined by their temporal and spatial proximity to the teacher. The frequency of occurrence at each level was recorded.

3.3.2. Second stage: co-occurrence analysis

In the second stage, a co-occurrence analysis was conducted to complement the descriptive findings and to examine relationships between expressed emotions and the situations in which they arose (Contreras, 2011). Because coding was applied at the paragraph level, it was possible to identify co-occurrences, defined as the simultaneous presence of at least one emotion code and one situation code in the same fragment. Results were represented using three Sankey diagrams (one for each analytical level), which visualize the flow and intensity of co-occurrences between categories. The width of the connections indicates observed frequency. In the diagrams, negative-valence emotions are represented in red, positive-valence emotions in blue, and situations in yellow.

3.3.3. Third stage: narrative analysis of IER

To characterize the IER strategies deployed in the group, a narrative analysis of interactions was conducted (Riessman, 2008), focusing on episodes in which teachers explicitly expressed emotions. This analysis considered both the responses of the group (comments, questions, interventions) and the emotional outcome of each episode, namely how the teacher positioned themselves or felt at the conclusion of the interaction.

Three group sessions were selected, within which significant episodes were identified, marked by the emotional expression of teachers recounting their classroom experiences. From these fragments, descriptive narratives were elaborated to reconstruct the unfolding of the interaction. On this basis, the mechanisms of IER that emerged in each case were identified and characterized. To illustrate this process, narrative productions (Balasch & Montenegro, 2003) were constructed to exemplify the group's emotional dynamics in action.

4. Findings

The results are presented in two parts. The first section details the emotions expressed during the analyzed sessions and the situations that triggered them. The second section examines how various IER strategies were employed, illustrated through three selected episodes from the PLC sessions.

4.1. Teacher emotions

The first part of the findings addresses the questions: (a) What emotions do teachers express during PRETeC sessions? (b) What situations are these emotions related to? Fig. 1 presents the emotions identified and their frequencies.

The most frequent negative emotions were *tension* and *stress*, expressed primarily through feelings of exhaustion and being overwhelmed:

... Sometimes I've thought, you know, I've had enough, I don't want to keep working as a teacher because it's just so exhausting. (...) You're constantly adapting to the system, preparing materials, trying things out, and you never really rest. It feels like you just collapse, and then come the crises (Bianca, session 1) [Tension/Stress]

Anxiety – expressed through worry, uncertainty, or distress – as well as fear, disappointment, and frustration, were also prevalent: "As the day of the class got closer, I started to feel afraid. I was worried about how my students would react, and I was also scared of how the parents would respond, since all the classes were being recorded" (Felix, session 5). [Fear]

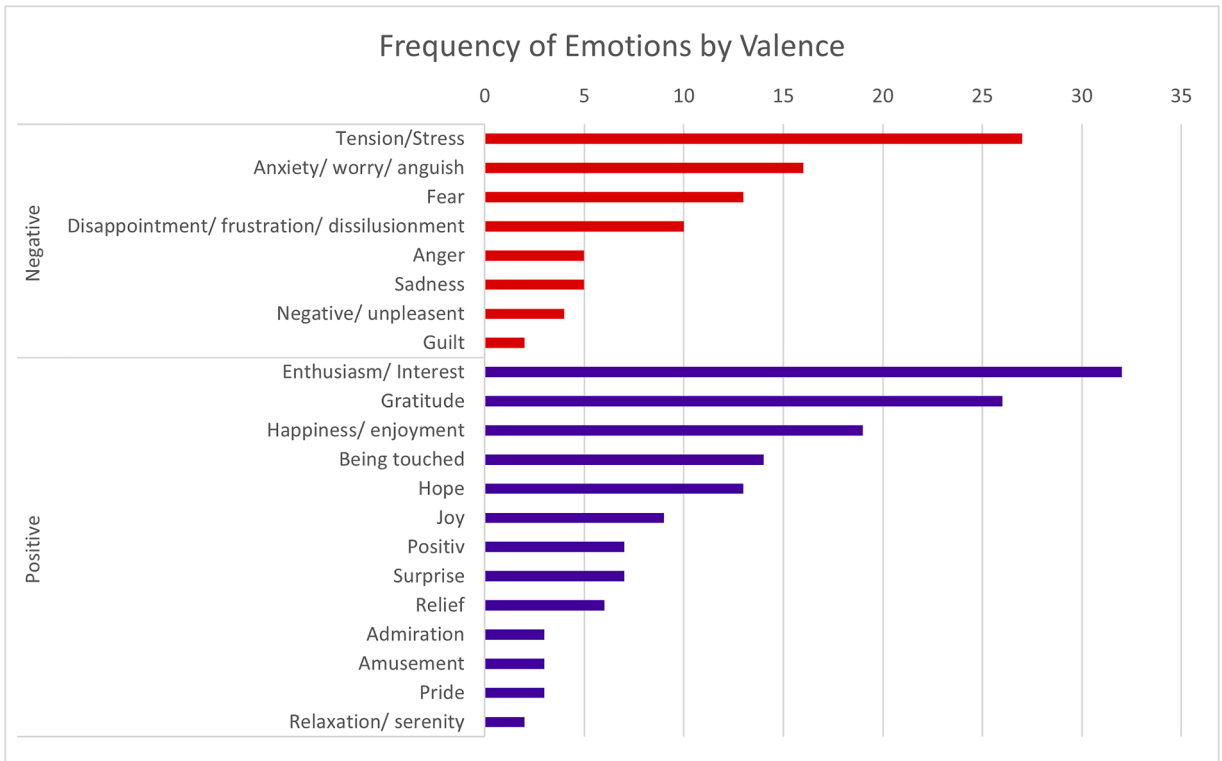


Fig. 1. Emotions and their frequencies. The emotion *surprise* was classified with positive valence, as it appeared only in association with positive emotions.

Among the positive emotions, enthusiasm, gratitude, and happiness were prominent: *“It was such an intense morning, very dialogic, and it honestly made me insanely happy. I really enjoyed it, because students who almost never speak actually spoke”* (Javier, session 4) [Happiness/Enjoyment].

The situations associated with these emotions were categorized into three levels, according to their temporal and spatial proximity

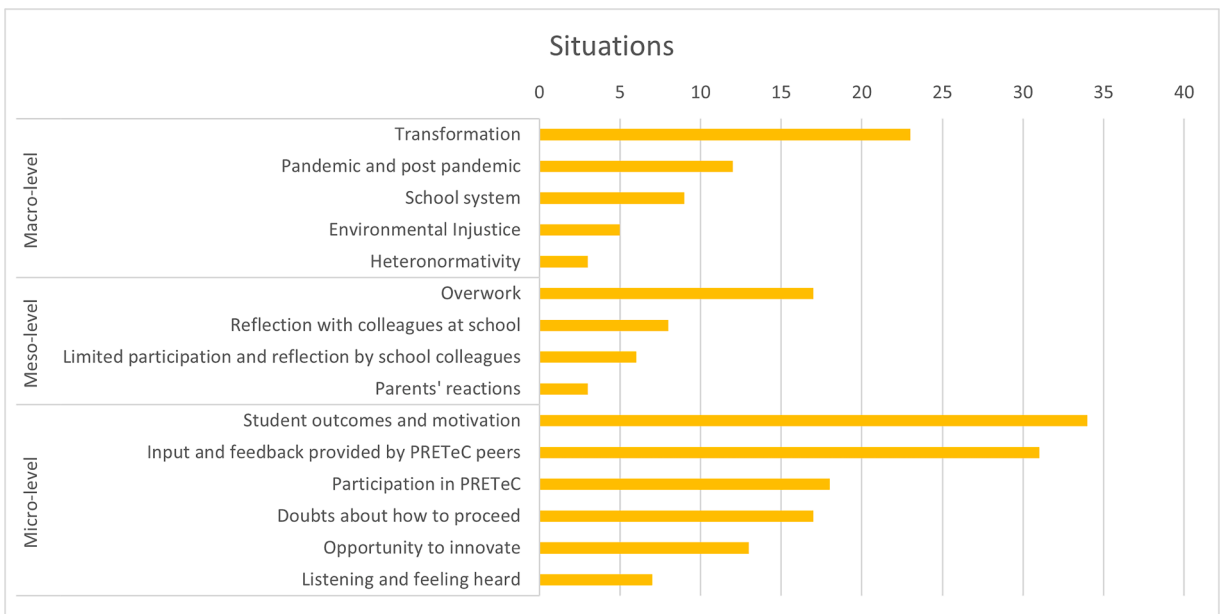


Fig. 2. Situations and their frequencies.

to the teacher. *Micro* situations referred to those occurring in the classroom, particularly in relation to teaching and learning processes and interactions with students, as well as dynamics within the PRETeC group sessions. *Meso* situations encompassed events outside the classroom but within the school, such as interactions with parents, school managers, and colleagues, including instances in which school colleagues participated in or refrained from reflection. *Macro* situations were linked to broader events or structures outside the school, involving the local community, society, the educational system, the environment, and – during the study period – the pandemic. Fig. 2 presents the analyzed situations and their frequencies.

Analysis of co-occurrences between teachers' emotions and the situations reported at each level shows that, at the *Macro level* (Fig. 3), most positive emotions are associated with the possibility of *transformation* – that is, conceiving the school, and science education in particular, as a driver of change with local impact. Examples include community projects and actions oriented towards social and environmental justice. In contrast, the *pandemic* and *post-pandemic* context – especially difficulties with online teaching, lack of interaction, nostalgia for the physical classroom, and institutional pressure – was primarily linked to negative emotions, although the return to in-person education generated happiness. Negative emotions were also tied to national-level factors, such as the Chilean *school system's* job insecurity and instability, lack of institutional and emotional support, and pressure to cover the curriculum. Other macro-level sources of negative emotions included *environmental injustice*, reflected in pollution, unequal access to resources such as water, and political indifference to the climate crisis. Finally, the *heteronormative* nature of Chilean society was associated with negative emotions such as anger, guilt, and stress, although discussing these issues within the PLC also generated gratitude.

At the *Meso level* (Fig. 4), negative emotions were mainly related to *overwork* caused by technical-administrative demands, excessive planning, evaluations, and long workdays, all of which undermined teachers' mental health and personal lives. Additional sources of negative emotions included *limited participation and reflection* by school *colleagues*, as well as *parents' reactions*. The latter referred to the pressure felt when parents questioned the implementation of innovative practices, provoking fear and concern. Positive emotions, by contrast, emerged in situations where meaningful *reflection with colleagues at school* was achieved.

At the *Micro level* (Fig. 5), situations most strongly associated with positive emotions included *input and feedback provided by PRETeC peers* during sessions, as well as *participation in PRETeC* itself. These exchanges enabled idea sharing, analysis of teaching experiences, and feedback on innovative practices, reinforcing the critical scientific literacy approach and linking curricular content with socially

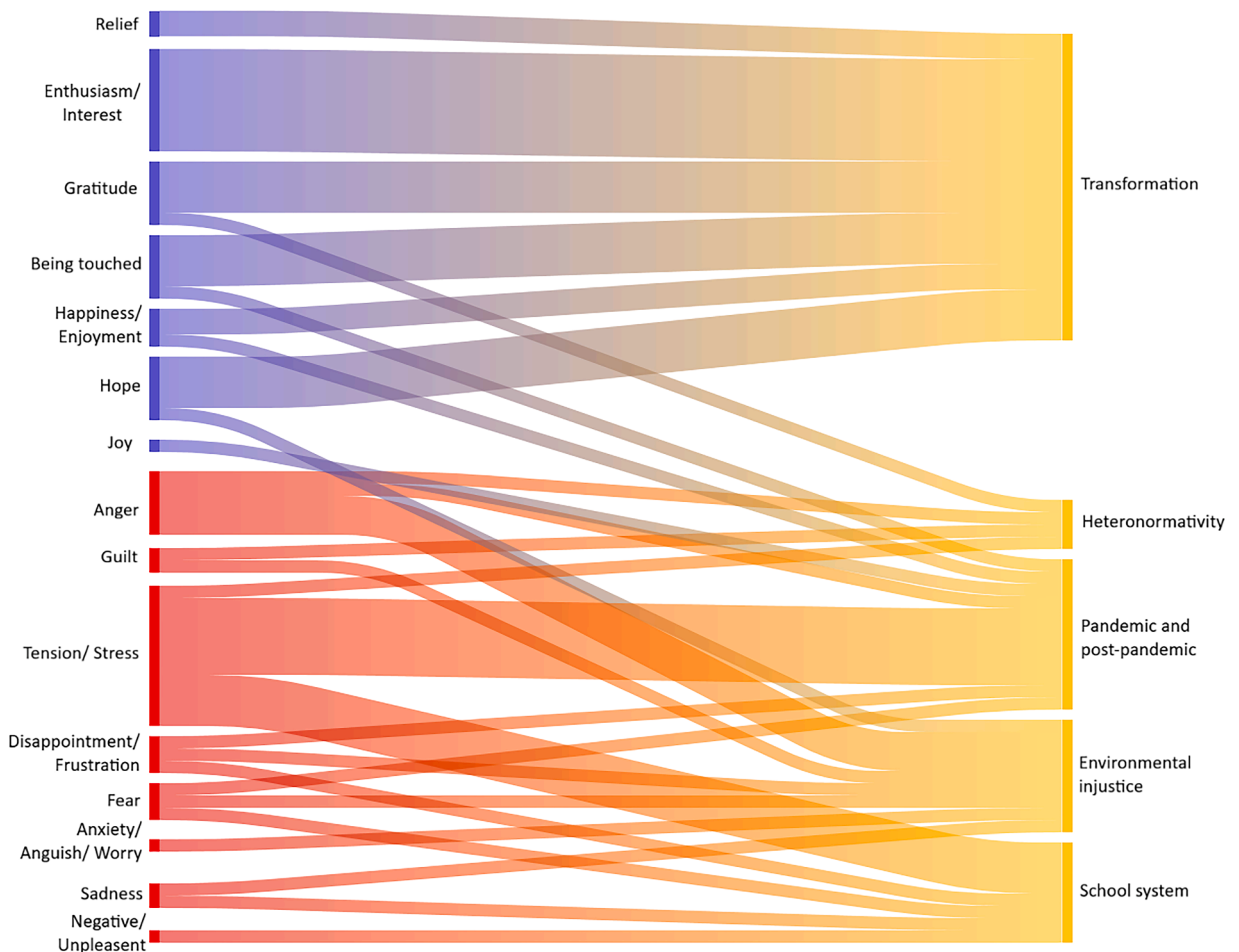


Fig. 3. Macro level: Co-occurrences between emotions and situations at the macro level.

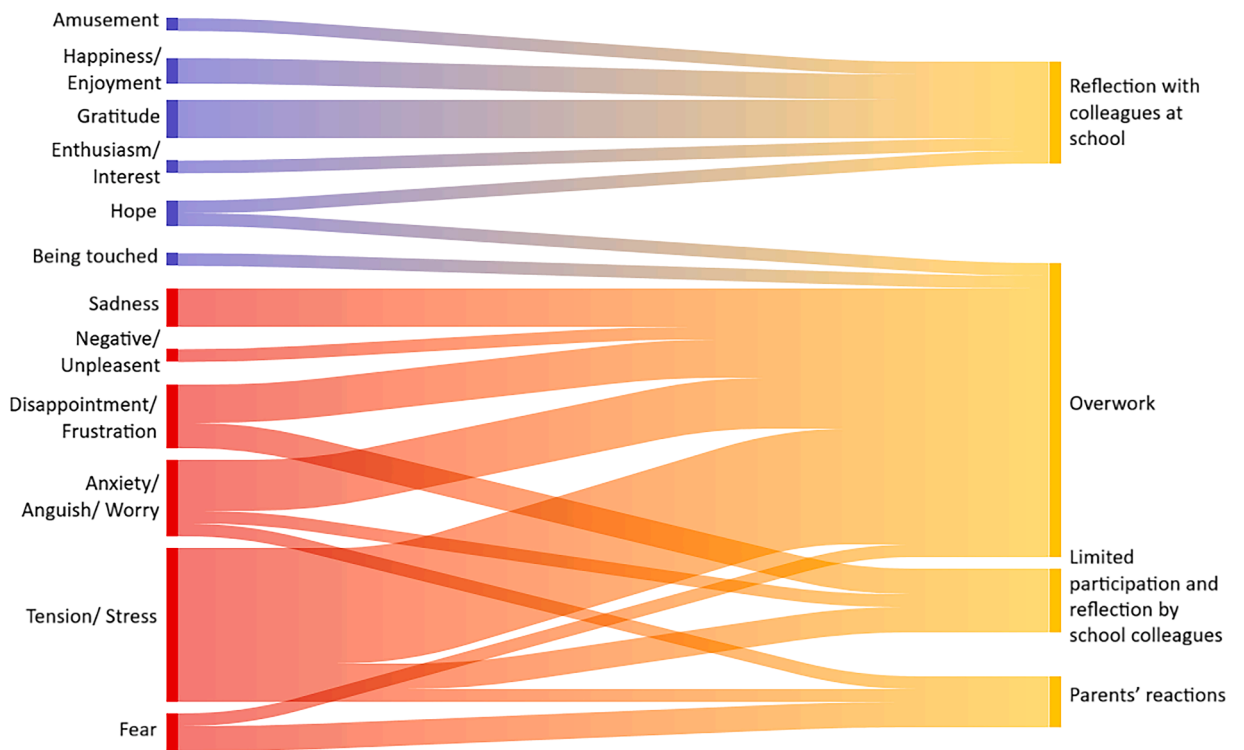


Fig. 4. Meso level: Co-occurrences between emotions and situations at the meso level.

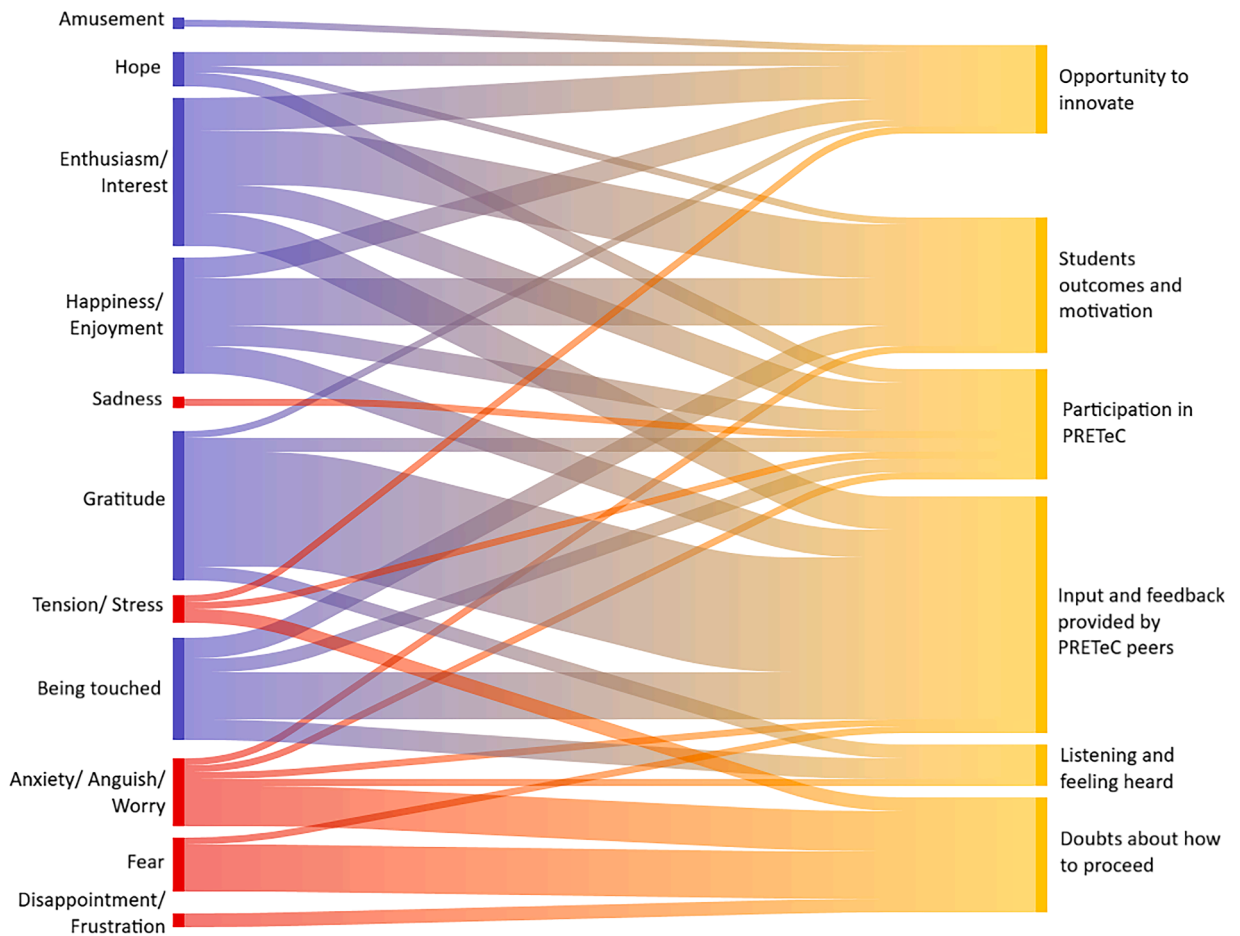


Fig. 5. Micro level: Co-occurrences between emotions and situations at the micro level.

relevant issues. Another type of situation consistently related to positive emotions was *student outcomes and motivation*, including learning achievements, enthusiasm in class, growing autonomy, and the development of school science projects. The *opportunity to innovate* in the classroom also emerged as a frequent source of enthusiasm, hope, and happiness. By contrast, *doubts about how to proceed* – particularly regarding pedagogical decisions, choice of strategies, activity relevance, curriculum alignment, and the management of complex situations – were associated with fear and concern. Teachers raised questions about how to guide reflective processes, integrate learning communities, and address sensitive issues with responsibility and coherence.

4.2. Interpersonal emotional regulation in the PRETeC community

This second part of the results addresses the question: (c) How does the group deploy interpersonal emotional regulation strategies during the sessions? Three episodes, which occurred in sessions 2, 4, and 5, are shown to illustrate how the group reacts to the emotions expressed by its members.

Episode 1: “The seed is there”, moving from frustration to hope

In session 2, Victoria, a biology teacher with 13 years of experience at the same school and 5 years in PRETeC, recounted her attempts to initiate a reflection space with colleagues. She had previously succeeded in doing so with members of the science department and now sought to extend the initiative to the humanities area. The process advanced slowly, marked by mistrust among colleagues and a lack of clarity regarding objectives. Just as Victoria felt she had generated some interest, the social outbreak occurred, followed a few months later by the pandemic, which brought all progress to a halt. Upon returning to in-person teaching, she tried once more to restart the reflection space, first with humanities colleagues and later again with the science department, but neither attempt succeeded: “(...) *we have lost what had been won with a lot of effort. There is no time. There are no opportunities to meet as a department. The days, classes and priorities have changed, and we teachers continue to work in isolation*”. Victoria ends her story by saying:

Victoria: The truth is, I’m really frustrated right now – just tired, really tired. And I don’t know, I don’t know... how to get this back on track, I don’t know (...). A group of us teachers said, ‘let’s meet up,’ and we did (...). But we were so exhausted (...). By the next semester, we were completely overwhelmed and couldn’t keep it going. We want to meet, but we just can’t.

The first to speak is Felix, a biology teacher with 6 years of experience (2 years in PRETeC):

Felix: Thank you for sharing your story. It's a really good and powerful story (...). It reminds me of when I met PRETeC and felt that this is what should be done in many other places as well. I see it the same way, so I understand your frustration. But I'm going to tell you what your story does to me. Listening to you leaves me with... do you know what it leaves me with? (...) It leaves me with the feeling that you succeeded. That the seed is still there.

Several other participants intervened, offering examples of situations that could also generate frustration and emphasizing the importance of regulating expectations. They acknowledged Victoria's effort and underscored that she was not responsible for the outcome, as external factors had played a decisive role. The metaphor of the seed was reiterated, with participants highlighting the need to wait for "*better conditions to develop*". The group encouraged Victoria to adopt a gradual approach, incorporating colleagues step by step, and stressed that the creation of spaces for reflection is inherently a slow process. They suggested concrete activities she could undertake with her colleagues, drawn from her own prior experience, while underscoring the importance of beginning with an understanding of the group's needs. One participant introduced an additional metaphor, suggesting that learning communities may have their own cycles, hibernating and later reawakening. "*Thinking like that takes the pressure off*," reflected Victoria. Toward the end, Cecilia, a science teacher educator, added the following comment:

Cecilia: I think you're like in the autumn season of the process.

Victoria: Yeah. And it is so good to be able to talk about it – like, who else would I even talk to? No one else would have understood what was going on. So, thank you. Really, thank you, thank you. This makes me feel good.

Episode 2: Biting the bullet: From fear to empowerment

In this session (5), Felix, a biology teacher, recounted an experience he carried out with his colleague and friend Teo, also a biology teacher at a Catholic school. Together they designed a teaching–learning sequence on sexuality and diversity for tenth-grade students, approached from both scientific and affective perspectives. What began as an ambitious idea – to teach that nature is not binary – became an opportunity to confront fears, establish trust with students, and redefine science teaching.

The sequence aimed to demonstrate that "*an incomplete understanding of the biological dimension of sexuality generates prejudice, discrimination and hate speech towards sexual diversity*" and that "*primary and secondary sexual characteristics do not determine behavior, expression or identity*". Its implementation, however, generated significant insecurities for both teachers, as they recount in their lesson story. "*I had many fears*," recalled Felix. "*At home I would think, well, whatever happens, this is in the curriculum... But still, if I have to leave the school, I'll leave. I'll go out like a martyr, making a lot of noise*." The fear was shared. Teo, while designing the classes, also had doubts: "*I kept asking myself, am I being biased? Could it be that this has no biological basis? I put myself in many scenarios. In all of them, someone questioned the proposal, and in everyone I didn't have the arguments to defend it*". But Felix told him: "*Come on, let's go all in, whatever happens. We'll bite the bullet and deal with it*".

The classroom experience proved highly encouraging. Students demonstrated a critical and sensitive understanding of the content. Felix confessed that when he read their responses to the closing activities, he thought: "[The students] *really understood everything (...)* They just need the right kind of stimuli to think deeply. And it's great that they feel free to express it." When Felix finished presenting his lesson story in PRETeC, Gustavo, a physics teacher and teacher educator with 35 years of experience (11 years in PRETeC), posed a question:

Gustavo: Felix, what is it that really moves you about this story?

Felix: For both of us, as members of the LGBTIQ+ community, the most moving thing... is helping to create a space where my students can be themselves. Neither Teo nor I could do that when we were students [the intervention stops, and Felix gets emotional], so that's very moving. Making that trusting space is tough, and that is why I pushed for it (...). To help the people we teach feel they belong to nature and that they can say 'this is who we are, and that's not a problem'.

Gustavo: Thank you, Felix. I learned a lot from your lesson story – and more than learned, I understood, and that is what matters. I feel you are on a very good path, not just for others to learn, but for you to feel good too. We all feel good. I share your emotion, Felix. Thank you.

Throughout the conversation, fears and doubts were re-signified. Cecilia revisited the phrase "*to bite the bullet*" from the lesson story and reframed it as a symbol of social commitment – teaching from a position of love rather than fear. Felix concluded the meeting with expressions of gratitude:

Felix: Thank you for being part of this – it's really important to me. Now I feel like I can do more things like this without fear. Here I can show myself as I really am and say: it's okay to be this way.

Episode 3: "Finding my own style": The adventure of the invented animal

In this lesson story (session 4), Javier, a novice biology teacher, recounted his experience teaching natural sciences to sixth-grade students in virtual mode during the pandemic. He presented an activity entitled "*The adventure of the invented animal*", designed to promote the construction of scientific concepts through the creation of fictitious organisms. Javier explained that his objective was to foster more creative and meaningful learning, challenging the traditional approach of the curriculum. During the discussion, Juan, a biology teacher with several more years of experience, opened the conversation by asking Javier how he felt during the activity and what aspects he considered significant for his professional development.

Juan: It's part of PRETeC's style that within the lesson stories there's always a space for reflection. It's not just about reporting how the class went, but about thinking of yourself as a teacher. How did you feel, and what do you take away for your own professional development? Beyond just saying, 'oh, that was cool, look what the students did' – it's about you. (...) Because you did a lot of things here, you really took risks. And well, it's your first time alone in the classroom.

Javier described his conflict with the official curriculum and the institutional pressure to adhere strictly to priority objectives, noting that his proposal represented an attempt to challenge this curricular framework:

Javier: I was scared (...) I went a bit outside of what the curriculum required. And the parents at this school, they're overly attentive to everything – what you do, what comes next, how you evaluate, what you're planning (...). But I decided to do it anyway. I bypassed the UTP [head of the technical-pedagogical unit], first because I skipped one of the priority objectives, and second because I stepped a little outside what the curriculum said.

The dialogue centered on Javier's search for a professional identity. As a first-year teacher, he noted that he was still in the process of defining his own pedagogical style.

Javier: It's said that you're an expert in your profession because you're an 'education professional' (...) like it's something innate, but you've never actually put it to the test. For me, as a first-year teacher, it was like putting that phrase to the test.

Gladys, a chemistry teacher with many years of experience, reinforced Javier's perspective by emphasizing that teachers are experts in their profession and should act accordingly, even when their convictions diverge from the recommendations of school authorities.

Gladys: I can only tell you this: if you feel that the lesson flows, then you did a great job (...) So if you're tempted, like you said, to try this activity or that one, and not necessarily follow what the UTP head tells you, that's fine.

Other colleagues complement this idea:

Gustavo: I think it's important that you take a personal view – to ask yourself whether that school is right for you, rather than whether you are right for the school. That way you take some of the pressure off yourself professionally. Because maybe if the school doesn't support you, then that school just isn't for you, right?

Cecilia: I think you can give in sometimes, as long as you don't give up your essence. You know? Like, when you feel you're doing something that isn't really you or doesn't match your way of teaching, that has nothing to do with your style (...) well, maybe that school isn't the place for you.

The group collectively validated the legitimacy of Javier's teaching practice and affirmed his right to explore his own pedagogical path. The session concluded with Javier expressing gratitude for the opportunity to share his lesson story: "*Thanks to you. It was nice to receive feedback*".

5. Discussion

The aim of this study was to examine how participation in a PLC contributes to the interpersonal regulation of science teachers' emotions.

With regard to research questions 1 and 2 – concerning the emotions expressed during PRETeC sessions and the situations in which they arose – the findings indicate that the most frequent positive emotions, such as enthusiasm, gratitude, and happiness, were linked to experiences that transcended individual perspectives, situating teaching within collective projects of educational transformation with social and environmental impact. These emotions reflected the relevance of peer recognition, the strengthening of belonging, and collaboration as affective practices that enhance teacher well-being.

By contrast, negative emotions, particularly those associated with the COVID-19 pandemic and with the structural conditions of the Chilean educational system, underscored the weight of contextual factors in shaping teachers' emotional experiences (Acuyo Céspedes, 2025). Digital fatigue, administrative overload, and lack of institutional support not only hindered pedagogical work but also affected mental health and teacher retention (Ávalos & Valenzuela, 2016; Barriga Silva et al., 2025). In this scenario, the PLC emerged as a space of affective resistance, where the co-construction of meanings, emotional validation, and mutual care enabled teachers to collectively process discomfort, re-signify experiences, and sustain their practice through a relational ethic.

Regarding the third – research question – how the group deployed interpersonal emotion regulation (IER) strategies during the sessions – the analyzed episodes demonstrated the fundamental role of IER in supporting teacher well-being and professional development. Asking directly about emotions fostered *labeling* (Zaki & Williams, 2013), which clarified emotional experiences through metaphors that broadened their meaning. Combined with *receptive listening* (Double et al., 2024), this promoted empathy and validation, generating a collaborative environment of support. *Valuing* both the experience and the individual (Double et al., 2024) provided security and empowerment. Emotional containment functioned as *safety signals* (Zaki & Williams, 2013), transforming emotions such as anger or fear into shared experiences that re-signified discomfort, strengthening trust, creativity, and professional growth. Finally, *cognitive reappraisal* (Double et al., 2024) enabled reinterpretation of experiences, reframing fear and anxiety as opportunities for professional development. Through dialogue, teachers redefined experiences, reinforced pedagogical identity, and mitigated frustration by recognizing that challenges often reflect structural complexities rather than personal failure. Such strategies are crucial, given that teachers' interpretations of their contexts influence their own emotions, their pedagogical decisions, and their

ability to co-regulate students' emotions (Kostel & Mänty, 2024). Collectively, these strategies strengthened bonds among teachers and fostered a sense of community and collaboration essential to the current educational landscape.

These findings align with scholarship that conceives PLCs not only as formative devices but also as significant spaces for IER, where new meanings of teaching are constructed and affective bonds are cultivated. Such spaces contribute to the emotional sustainability of teachers and support their resistance to structural adversity. Furthermore, the study shows that IER does not occur spontaneously but is enabled by collective conditions such as trust, horizontality, and recognition (González-Weil et al., 2025). Within this framework, the PLC functioned both as a space of containment and as a platform for collective agency, allowing teacher well-being to be redefined not as an individualized responsibility but as a relational and ethical project, situated within a context of persistent educational instability.

The consideration of PLCs as sites for IER remains underexplored. One of the first contributions in this area is the work of Nazari et al. (2025), who concluded that when PLCs address emotional tensions, they generate positive effects on teachers' professional growth and identity development. Given the scarcity of studies, further research is needed to deepen understanding of the emotional dimensions of PLCs, particularly their contributions to teacher well-being.

For science teachers, strengthening IER is especially relevant, since they often confront emotionally complex content such as climate change (Beasy et al., 2023), the environmental crisis, and sexuality. In Latin America, the emotional burden of witnessing ecological and social injustice further intensifies this challenge, particularly for science teachers engaged in environmental activism, where the pursuit of ecological justice must be balanced against significant personal, professional, and sociopolitical risks (González-Urzuúa et al., 2025). This is compounded by structural inequality, institutional pressure, and systemic precariousness that characterize Latin American educational contexts (Cornejo Chávez et al., 2020), contributing to high teacher attrition.

Under this scenario, various studies highlight the importance of integrating emotional education into teacher training (Fiorilli et al., 2017; Godoy Guevara & Trujillo Méndez, 2024; Lagos San Martín & López-López, 2020; Lozano-Peña et al., 2021). In Chile, the *Pedagogical and Disciplinary Standards for Teaching Degrees* were defined in 2022 (MINEDUC, 2022). Although these standards emphasize the need for teachers to develop social and emotional skills, these are framed primarily in relation to supporting students' socioemotional development, rather than equipping teachers with tools to manage and regulate their own emotions. Similarly, a study by Bächler Silva et al. (2020), which examined four elementary education programs across Chilean universities, found that only in one program did teacher trainees perceive emotions as a central element of their preparation. In the other programs, emotional training was perceived as deficient or irrelevant. This gap in the development of teachers' emotional skills is also evident in other Latin American contexts, including Colombia and Venezuela (Acosta Faneite, 2023; Barrios Tao et al., 2019; García Cano & Niño Murcia, 2023).

In the field of in-service teacher education and given the need to strengthen teachers' socioemotional development – particularly in terms of emotional regulation – this article provides evidence supporting the consideration of PLCs as valuable spaces for this purpose. In Chile, it is suggested that PLCs could be explicitly integrated into the Local Teacher Training Plans that schools are required to design. For initial training, we recommend evaluating the possibility of enabling education students to participate in PLCs, ideally alongside practicing teachers, with whom they can share experiences and learning.

It is important to distinguish between two complementary dimensions of emotional skill development. At the individual level, efforts should focus on enabling teachers to identify, express, and regulate their own emotions. At the collective level, PLCs can serve as safe spaces of trust and reciprocity, where teachers share experiences, validate emotions, and jointly construct coping strategies. While the first dimension contributes to personal well-being and self-awareness, the second enhances professional cohesion, belonging, and resilience in the face of school demands.

From a research perspective, there is an urgent need to strengthen and expand studies on teachers' emotions in Latin America. The present work contributes to this effort.

6. Conclusions

This study examined how participation in a PLC contributes to interpersonal emotion regulation (IER) among science teachers. Positive emotions expressed in the PLC, such as enthusiasm and gratitude, were associated with collective experiences of social significance, whereas negative emotions reflected the impact of structural conditions inherent to the Chilean school system. In the context analyzed, the PLC functioned as a space of support where IER strategies strengthened bonds and promoted teacher well-being.

We conclude that PLCs not only foster professional development but also constitute affective-political spaces that provide emotional support to teachers. Given the scarcity of studies on IER within PLCs – particularly in Latin American contexts marked by inequality and teacher activism – there is a need to advance a research agenda that systematically integrates the emotional dimension into both initial and continuing teacher education.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used DeepL to translate the text from Spanish into English. After using this tool/service, the authors reviewed and edited the content as needed and takes full responsibility for the content of the published article.

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CRediT authorship contribution statement

Corina González-Weil: Writing – review & editing, Writing – original draft, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Fabián Fernández Araneda:** Writing – review & editing, Writing – original draft, Validation, Investigation, Formal analysis, Data curation. **María Isabel Reyes-Espejo:** Writing – review & editing, Validation, Methodology, Funding acquisition, Formal analysis.

Declaration of competing interest

The authors have no conflicts of interest to declare.

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References

- Acosta Faneite, S. F. (2023). Competencias emocionales de los docentes y su relación con la educación emocional de los estudiantes. *Revista Dialogus*, 12, 53–71. <https://doi.org/10.37594/dialogus.v1i12.1192>
- Acuña, T., Avilés, D., Bravo, P., Cisternas, D., González-Weil, C., Henríquez, C., ... Santana, J. (2016). Profesores reflexionando por una educación transformadora en ciencias (PRETeC). *Docencia*, 60, 43–53.
- Acuyo Cespedes, A. (2025). Teachers in transition: A qualitative exploration into the impact of emergency remote teaching on professional development. *International Journal of Educational Research*, 130, 1–14. <https://doi.org/10.1016/j.ijer.2025.102548>
- Aldrup, K., Carstensen, B., & Klusmann, U. (2024). The role of teachers' emotion regulation in teaching effectiveness: A systematic review integrating four lines of research. *Educational Psychologist*, 59(2), 89–110. <https://doi.org/10.1080/00461520.2023.2282446>
- Allaire, F. S., King, J. P., & Frenzel, A. C. (2024). Measuring science-teaching affect: first results on the science teaching emotions scales (Sci-TES). *Journal of Science Teacher Education*, 35(5), 465–479. <https://doi.org/10.1080/1046560X.2023.2291884>
- Aparicio Molina, C., & Sepúlveda López, F. (2018). Análisis del modelo de Comunidades Profesionales de Aprendizaje a partir de la indagación en experiencias de colaboración entre profesores. *Estudios Pedagógicos*, 64(3), 55–73. <https://doi.org/10.4067/S0718-07052018000300055>
- Ávalos, B., & Valenzuela, J. P. (2016). Education for all and attrition/retention of new teachers: A trajectory study in Chile. *International Journal of Educational Development*, 49, 279–290. <https://doi.org/10.1016/j.ijedudev.2016.03.012>
- Bächler Silva, R., Meza Fernández, S., Mendoza, L., & Poblete Christie, O. G. (2020). Evaluación de la formación emocional inicial docente en Chile. *Revista de Estudios y Experiencias en Educación*, 19(39), 75–106. <https://doi.org/10.21703/rexe.20201939bachler5>
- Balasch, M., & Montenegro, M. (2003). Una propuesta metodológica desde la epistemología de los conocimientos situados: las producciones narrativas. *Encuentros en Psicología Social*, 1(3), 44–48.
- Barriga Silva, T., Canales Osorio, D., & Lagos Contreras, J. (2025). Deserción docente en Chile: factores, consecuencias y políticas públicas. *Revista Reflexión e Investigación Educativa*, 7(1), 1–10. <https://doi.org/10.22320/reined.v7i1.6941>
- Barrios Tao, H., Peña Rodríguez, L. J., & Cifuentes Bonnet, R. (2019). Emociones y procesos educativos en el aula: una revisión narrativa. *Revista Virtual Universidad Católica Del Norte*, 58, 202–222. <https://doi.org/10.35575/rvucen.n58a11>
- Beasy, K., Jones, C., Kelly, R., Lucas, C., Mocatta, G., Pecl, G., & Yildiz, D. (2023). The burden of bad news: Educators' experiences of navigating climate change education. *Environmental Education Research*, 29(11), 1678–1691. <https://doi.org/10.1080/13504622.2023.2238136>
- Beddoes, Z., Prusak, K., Barney, D., & Pennington, T. (2023). Attending to the emotional side of professional learning communities (PLCs) by cultivating positive team dynamics. *Journal of Physical Education, Recreation and Dance*, 94(4), 21–25. <https://doi.org/10.1080/07303084.2023.2172114>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Bravo Lucas, E., Brígido Mero, M., Hernández Del Barco, M. A., & Mellado Jiménez, V. (2022). Las emociones en ciencias en la formación inicial del profesorado de infantil y primaria. *Revista Interuniversitaria de Formación Del Profesorado*, 97(36.1), 57–74. <https://doi.org/10.47553/riifop.v97i36.1.92426>
- Büssing, A. G., Dupont, J., & Menzel, S. (2020). Topic specificity and antecedents for preservice biology teachers' Anticipated enjoyment for teaching about socioscientific issues: investigating universal values and psychological distance. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2020.01536>, 11, Article 1536.
- Byun, S., & Jeon, L. (2023). Preschool teachers' psychological wellbeing, emotion regulation, and emotional responsiveness: A US-Korea comparison. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1152557>. Article 1152557.
- Cabezas, V., Gómez, C., Orrego, V., Medeiros, M. P., Palacios, P., Nogueira, A., Suckel, M., & Peria, A. (2021). Professional learning communities in Chile: Dimensions and development stages. *Estudios Pedagógicos*, 47(3), 141–165. <https://doi.org/10.4067/S0718-07052021000300141>
- Chen, J. (2021). Refining the teacher emotion model: Evidence from a review of literature published between 1985 and 2019. *Cambridge Journal of Education*, 51(3), 327–357. <https://doi.org/10.1080/0305764X.2020.1831440>
- Contreras, R. B. (2011). Examining the context in qualitative analysis: The role of the Co-occurrence tool in ATLAS.Ti. https://downloads.atlasti.com/library/contreras_n1201108.pdf.
- Cornejo Chávez, R., Etcheberrigaray, G., Vargas, S., & Assaél, J. (2020). Emociones y trabajo docente: Organizando un debate científico ausente en América Latina. *Curriculo Sem Fronteiras*, 20(1), 332–347. <https://doi.org/10.35786/1645-1384.v20.n1.18>
- Centro de Perfeccionamiento, Experimentación e Investigaciones Pedagógicas (CPEIP). (n.d.). Formación local para el desarrollo profesional docente. CPEIP. <https://www.cpeip.cl/formacion-local/>.
- Double, K. S., MacCann, C., Kunst, H., & Pinkus, R. T. (2024). Regulating others' emotions: An exploratory study of everyday extrinsic emotion regulation in university students. *Personality and Individual Differences*, 226. <https://doi.org/10.1016/j.paid.2024.112687>. Article 112687.
- Fiorilli, C., Albanese, O., Gabola, P., & Pepe, A. (2017). Teachers' emotional competence and social support: Assessing the mediating role of teacher burnout. *Scandinavian Journal of Educational Research*, 61(2), 127–138. <https://doi.org/10.1080/00313831.2015.1119722>
- Frenzel, A. C., Daniels, L., & Burić, I. (2021). Teacher emotions in the classroom and their implications for students. *Educational Psychologist*, 56(4), 250–264. <https://doi.org/10.1080/00461520.2021.1985501>
- Frenzel, A. C., Fiedler, D., Marx, A. K. G., Reck, C., & Pekrun, R. (2020). Who enjoys teaching, and when? Between- and within-person evidence on teachers' appraisal-emotion links. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01092>. Article 1092.
- García Cano, L., & Niño Murcia, S. (2023). La regulación emocional en docentes de educación en formación. *Pensamiento Educativo*, 60(3), 1–14. <https://doi.org/10.7764/PEL.60.3.2023.1>
- Gkonou, C., & Miller, E. R. (2023). Relationality in language teacher emotion regulation: Regulating emotions through, with and for others. *System*, 115. <https://doi.org/10.1016/j.system.2023.103046>

- Godoy Guevara, F. R., & Trujillo Méndez, D. A. (2024). Formación en competencias socioemocionales para docentes: Una revisión sistemática. *Arandu UTIC*, 11(2), 1793–1806. <https://doi.org/10.69639/arandu.v11i2.371>
- Gómez-Rivera, Y. B., & Acosta-Silva, D. A. (2021). Ayudar y recibir ayuda de otros: Precisiones sobre la regulación emocional interpersonal. *Diversitas*, 17(2). <https://doi.org/10.15332/22563067.7080>
- González-Urzuá, B., Guerrero, G., González-Weil, C., & Malhue-Campusano, P. (2025). Science Education in Extractivist Territories: Challenges for Socio-eco Justice Through Environmental Activism Teachers' Practices. In L. Benzec (Ed.), *Building Networks for Critical and Altruistic Science Education* (pp. 557–576). Springer. <https://doi.org/10.59327/IPCC/AR6-9789291691647>.
- González-Weil, C., Reyes-Espejo, M. I., Bravo González, P., Acuña Ruz, F., & Fernández Arandeda, F. (2025). How do you trust in the midst of mistrust? A longitudinal study (2010–2021) on building trust in a professional learning community of science teachers in Chile. *Professional Development in Education*, 51(1), 39–53. <https://doi.org/10.1080/19415257.2024.2431701>
- Greenier, V., Derakhshan, A., & Fathi, J. (2021). Emotion regulation and psychological well-being in teacher work engagement: A case of British and Iranian English language teachers. *System*, 97. <https://doi.org/10.1016/j.system.2020.102446>. Article 102446.
- Gross, J., & Thompson, R. (2007). Emotion regulation: conceptual foundations. In R. Thomson (Ed.), *Handbook of emotion regulation* (pp. 3–24). The Guilford Press. <https://www.researchgate.net/publication/303248970>.
- Guerra, P., Cuadros, O., & Calderón, M. (2024). Professional well-being in professional learning communities of early childhood teachers. *European Early Childhood Education Research Journal*. <https://doi.org/10.1080/1350293X.2024.2443648>
- Hairon, S., Goh, J. W. P., Chua, C. S. K., & Wang, L. Y. (2017). A research agenda for professional learning communities: Moving forward. *Professional Development in Education*, 43(1), 72–86. <https://doi.org/10.1080/19415257.2015.1055861>
- Han, J., Yin, H., & Wang, J. (2020). Examining the relationships between job characteristics, emotional regulation and university teachers' Well-being: the mediation of emotional regulation. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01727>. Article 1727.
- Hernández Lémann, E., & Caffi Pizarro, D. (2020). El programa de indagación científica para la educación en ciencias. *Revista de Innovación En Enseñanza de Las Ciencias*, 4(1), 3–12. <https://doi.org/10.5027/reinnec.v4.i1.70>
- Jaspal, R., Carriere, K. R., & Moghaddam, F. M. (2016). Bridging micro, meso and macro processes in social psychology. In G. Marsico, J. Valsiner, N. Chaudhary, T. Sato, & V. Dazzina (Eds.), *Psychology as a science of human being: The Yokohama manifesto* (pp. 265–278). Springer. https://doi.org/10.1007/978-3-319-21094-0_15.
- Jiménez-Yáñez, C. (2020). #Chiledespertó: causas del estallido social en Chile. *Revista Mexicana de Sociología*, 82(4), 949–957.
- Kostøl, E. M. F., & Mänty, K. (2024). Co-regulating the child's emotions in the classroom: Teachers' interpretations of and decision-making in emotional situations. *International Journal of Educational Research*, 127. <https://doi.org/10.1016/j.ijer.2024.102390>. Article 102390.
- Lagos San Martín, N. G., & López-López, V. (2020). Repensar la formación inicial docente desde una dimensión socioemocional. *Revista Educación*, 578–587. <https://doi.org/10.15517/revedu.v45i1.41464>
- Leiva, R. C., Chávez, L., Barriga, V., Uribe, I., Álvarez, C., Barría, D., Ruíz, G., Nuñez, J. J., Leiva, C., Chávez, L., Barriga, V., Uribe, I., Álvarez, C., Barría, D., Ruíz, G., & Nuñez, J. J. (2020). Las comunidades de aprendizaje en la Región de Los Ríos: Experiencias y desafíos en la enseñanza de las ciencias a través del enfoque indagatorio. *Revista de Innovación en Enseñanza de las Ciencias*, 4(2), 3–14. <https://doi.org/10.5027/reinnec.V4.I2.106>
- Liang, W., Song, H., & Sun, R. (2022). Can a professional learning community facilitate teacher well-being in China? The mediating role of teaching self-efficacy. *Educational Studies*, 48(3), 358–377. <https://doi.org/10.1080/03055698.2020.1755953>
- Liddell, B. J., & Williams, E. N. (2019). Cultural differences in interpersonal emotion regulation. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.00999>. Article 999.
- Liu, S., Wang, Y., & Yin, H. (2025). A meta-analysis of the correlation between professional learning communities and teachers' efficacy beliefs. *Educational Research Review*, 46. <https://doi.org/10.1016/j.edurev.2024.100660>. Article 100660.
- Lozano-Peña, G., Sáez-Delgado, F., López-Angulo, Y., & Mella-Norambuena, J. (2021). Teachers' social-emotional competence: History, concept, models, instruments, and recommendations for educational quality. *Sustainability*, 13(21). <https://doi.org/10.3390/su132112142>
- Mellado, V., Borrachero, A. B., Brígido, M., Melo, L. V., Dávila, M. A., Cañada, F., Conde, M. C., Costillo, E., Cubero, J., Esteban, R., Martínez, G., Ruiz, C., Sánchez, J., Garriz, A., Mellado, L., Vázquez, B., Jiménez, R., & Bermejo, M. L. (2014). Las emociones en la enseñanza de las ciencias, 32(3), 11–36. <https://doi.org/10.5565/rev/ensciencias.1478>.
- MINEDUC. (2022). *Estándares pedagógicos y disciplinarios para carreras de pedagogía en Biología. Centro de perfeccionamiento, experimentación e investigaciones pedagógicas CPEIP*. Chile: Ministerio de Educación.
- Muehlbacher, F., & Hagenauer, G. (2023). Team teachers' emotions and their antecedents in the classroom. *European Journal of Teacher Education*, 1–19. <https://doi.org/10.1080/02619768.2023.2293634>
- Muñoz-Troncoso, F., Riquelme-Mella, E., Halberstadt, A. G., Montero, I., Sepúlveda-Bernales, V., Fuentes-Vilugrón, G., Miranda-Zapata, E., Legaz-Vladimirskaia, E., Caamaño-Navarrete, F., & Muñoz-Troncoso, G. (2024). Emotional regulation challenges in Chilean teachers: An analysis of the measurement invariance of the DERS-E and the influence of gender and age. *Journal of Intelligence*, 12(9), 86. <https://doi.org/10.3390/jintelligence12090086>
- Nazari, M., Keshvari, Z., & Hu, G. (2025). Professional Learning Community as a site for addressing emotional tensions: Contributions to language teacher identity (Re)construction. *British Journal of Educational Studies*, 1–24. <https://doi.org/10.1080/00071005.2025.2481838>
- Nozaki, Y., & Mikolajczak, M. (2023). Effectiveness of extrinsic emotion regulation strategies in text-based online communication. *Emotion (Washington, D.C.)*, 23(6), 1714–1725. <https://doi.org/10.1037/emo0001186.supp>
- Ohayon, A., & Albulescu, I. (2023). Influence of teachers participation in professional learning community on their teaching skills. In , 6. *Proceedings of 10th international conference Education, Reflection, Development (ERD 2022)*, 24 June 2022 (pp. 445–451). <https://doi.org/10.15405/epes.23056.40>
- Owen, S. (2016). Professional learning communities: building skills, reinvigorating the passion, and nurturing teacher wellbeing and “flourishing” within significantly innovative schooling contexts. *Educational Review*, 68(4), 403–419. <https://doi.org/10.1080/00131911.2015.1119101>
- Pan, H. L. W., & Cheng, S. H. (2023). Examining the impact of teacher learning communities on self-efficacy and professional learning: An application of the theory-driven evaluation. *Sustainability*, 15(6). <https://doi.org/10.3390/su15064771>. Article 4771.
- Quiroz Reyes, C. (2020). Pandemia Covid-19 e inequidad territorial: El agravamiento de las desigualdades educativas en Chile. *Revista Internacional de Educación Para La Justicia Social*, 9, 1–6. www.rinace.net/riejs/.
- Retana-Alvarado, D., De Las Heras Pérez, M.Á., Vázquez-Bernal, B., & Jiménez-Pérez, R. (2018). El cambio en las emociones de maestros en formación inicial hacia el clima de aula en una intervención basada en investigación escolar. *Revista Eureka*, 15(2). https://doi.org/10.25267/Rev_Eureka_ensen_divulg_cienc.2018.v15.i2.2602. Article 2602.
- Riessman, C. (2008). *Narrative methods for the human sciences*. Sage Publications.
- Schaap, H., Louws, M., Meirink, J., Oolbekkink-Marchand, H., Van Der Want, A., Zuiker, I., Zwart, R., & Meijer, P. (2019). Tensions experienced by teachers when participating in a professional learning community. *Professional Development in Education*, 45(5), 814–831. <https://doi.org/10.1080/19415257.2018.1547781>
- Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, 44(4), 695–729. <https://doi.org/10.1177/0539018405058216>
- Schutz, P. A., Hong, J. Y., Cross, D. L., & Osbon, J. N. (2006). Reflections on investigating emotion in educational activity settings. *Educational Psychology Review*, 18(4), 343–360. <https://doi.org/10.1007/s10648-006-9030-3>
- Taxer, J. L., & Gross, J. J. (2018). Emotion regulation in teachers: The “why” and “how. *Teaching and Teacher Education*, 74, 180–189. <https://doi.org/10.1016/j.tate.2018.05.008>
- Torres-Olave, B., & Bravo González, P. (2021). Facing neoliberalism through dialogic spaces as sites of hope in science education: Experiences of two self-organised communities. *Cultural Studies of Science Education*, 16(4), 1047–1067. <https://doi.org/10.1007/s11422-021-10042-y>
- United Nations Development Program (UNDP). (2023). Evaluación del sistema de apoyo formativo y del sistema de reconocimiento y promoción de la Ley 20.903. <https://www.undp.org/es/chile/publicaciones/informe-final-evaluacion-del-sistema-de-apoyo-formativo-y-del-sistema-de-reconocimiento-y-promocion-de-la-ley-20903>.

- Uzuntiryaki-Kondakci, E., Kirbulut, Z. D., Oktay, O., & Sarici, E. (2022). A qualitative examination of science teachers' emotions, emotion regulation goals and strategies. *Research in Science Education*, 52(4), 1131–1155. <https://doi.org/10.1007/s11165-020-09986-y>
- Vangrieken, K., Meredith, C., Packer, T., & Kyndt, E. (2017). Teacher communities as a context for professional development: A systematic review. *Teaching and Teacher Education*, 61, 47–59. <https://doi.org/10.1016/j.tate.2016.10.001>
- Wang, M., & Wang, Y. (2023). Exploring the contribution of interpersonal emotion regulation to pre-service EFL teachers' sustainable professional development and wellbeing. *Porta Linguarum Revista Interuniversitaria de Didáctica de Las Lenguas Extranjeras*, 2023c, 329–347. <https://doi.org/10.30827/portalin.vi2023c.29657>
- Wu, L., Qiu, C., & Ling, B. (2025). Collaborative emotion regulation and professional development of student language teachers in online teaching: A community of practice perspective. *Teaching and Teacher Education*, 158. <https://doi.org/10.1016/j.tate.2025.104969>
- Xiao, J., & Tian, G. (2023). Sailing together in the storm": Chinese EFL teachers' trajectory of interpersonal emotion regulation towards well-being. *Sustainability*, 15(7). <https://doi.org/10.3390/su15076125>. Article 6125.
- Zaki, J. (2020). Integrating empathy and interpersonal emotion regulation. *Annual Review of Psychology*, 71, 517–540. <https://doi.org/10.1146/annurev-psych-010419>
- Zaki, J., & Williams, C. W. (2013). Interpersonal emotion regulation. *Emotion (Washington, D.C.)*, 13(5), 803–810. <https://doi.org/10.1037/a0033839>
- Zhang, J., Li, Y., Zeng, Y., & Lu, J. (2024). Exploring the mediating role of teacher identity between professional learning community and teacher resilience: Evidence from Eastern China. *Humanities and Social Sciences Communications*, 11(1). <https://doi.org/10.1057/s41599-024-03800-0>. Article 1290.
- Zheng, X., Yin, H., & Liu, Y. (2021). Are professional learning communities beneficial for teachers? A multilevel analysis of teacher self-efficacy and commitment in China. *School Effectiveness and School Improvement*, 32(2), 197–217. <https://doi.org/10.1080/09243453.2020.1808484>