



Research paper

Implementation quality and preliminary impacts of compassion-based training on preservice teachers' social-emotional competencies and wellbeing: A propensity score-matched study in Mexico

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ABSTRACT

Teachers' social-emotional competencies (SEC) are critical for teacher wellbeing, classroom instruction, and effective student SEL program implementation, yet research on cultivating SEC in preservice teachers remains limited. This mixed-methods, quasi-experimental study evaluated a compassion-based preservice teacher course using propensity score matching. Feasibility analyses indicated that the course was acceptable to PSTs and implementable by instructors. Doubly robust propensity score-matched and weighted hierarchical linear models ($n = 354$; 177 per group) with false discovery rate correction to control for multiple outcome tests revealed statistically significant effects on perspective-taking ($SMD = 0.39$, $pFDR = 0.005$) and empathic concern ($SMD = 0.28$, $pFDR < .001$). Small, non-significant effects favoring the treatment group were found for self-compassion, flourishing, self-regulation, and sleep quality; while effects on mindfulness, attention regulation, health, sleep quantity, and anxiety were negligible and non-significant. These findings offer initial promising evidence that a compassion-based course can meaningfully cultivate preservice teachers' SEC.

1. Introduction

Internationally, there is growing recognition of the need for teacher education programs to systematically develop preservice teachers' (PSTs) social-emotional competencies (Canli et al., 2025; Gidalevich & Mirkin, 2024; Hon et al., 2024; Markowitz & Bouffard, 2025; Weemer & Wodika, 2023). In the United States, a critical preparation gap exists where only 16% of K-12 teachers receive SEC training in preservice teacher education, leaving them underprepared to address students' social and emotional needs (Greenberg, 2023; Hamilton et al., 2019; Schonert-Reichl, 2017). In Mexico, although social and emotional learning (SEL) was mandated for school in 2017, more than half of teachers sampled revealed that they have not taken any course on SEL in the last two years (INEE, 2018). This gap in training is important because research consistently shows that SEL improves student academic performance, citizenship, and health outcomes while reducing problematic behaviors (Cipriano et al., 2023; Durlak et al., 2011;

Hawkins et al., 2008). This study contributes to the global conversation on teacher SEC and student SEL by examining whether a contemplative-based SEL approach for teachers can be adapted and implemented within the Mexican PST educational context.

Teachers' SEC – skills like attentional focus, empathy, perspective taking and compassion – are increasingly understood to be an important aspect of what constitutes a “good teacher” (Roeser et al., 2025). Teacher SEC development through programs sometimes called “adult SEL” (CASEL) are linked to teacher wellbeing (Roeser et al., 2012), higher-quality instruction, and more supportive classroom learning climates (Jennings & Greenberg, 2009). Of importance, adult SEL program implementation quality is associated with teacher SEC development (Schonert-Reichl, 2017). However, high quality adult SEC implementation is difficult and current programs do not sufficiently address all the five SEL competencies outlined by CASEL, especially the domain of self-awareness (Gimbert et al., 2023; Schonert-Reichl, 2017). Research has identified major barriers to effective adult SEL

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implementation, including insufficient professional development time for building teachers' own SECs and a lack of teacher SEL curricula (Hooper & Johnson, 2025). Embedding teacher SEL development upstream within PST education may provide an opportunity to develop teacher SEC before competing professional demands emerge (Hon et al., 2023; Jones et al., 2013; Markowitz & Bouffard, 2025).

CASEL (n.d.) defines social-emotional learning as “the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions” (para. 2). Their framework identifies five core competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. Within this framework, compassion—a warm-hearted concern, arising from witnessing the struggles or challenges of others, that wishes to see those struggles and challenges alleviated—work synergistically (Ash et al., 2021). Empathy is folded into this definition of compassion that enables perspective-taking; however, compassion provides the emotional resilience to act on that understanding without experiencing empathic distress. Self-compassion research has shown to buffer teachers against burnout while maintaining their capacity for other-directed care (Jennings, 2015; Moè & Katz, 2020). Self-compassion in CBCT is defined as “an inner fortitude that fosters an enduring attitude of kindness toward the self, especially in the face of life's adversities, and a commitment to identify and alleviate the underlying causes of one's suffering”. Hence, compassion for others and self are intimately related and builds on the SEC competencies identified in CASEL framework.

Since 2017, there has been a focus on student SEL programs in elementary schools in Mexico. In 2019, with the introduction of the New Educational Model (NEM) and its focus on developing ethical, critical citizens committed to social transformation, student SEL has gained even greater prominence (Chernicoff et al., 2025). Over the ensuing years, efforts have been made to develop teachers' SECs because of this growing demand for high-quality student SEL program implementation (Domínguez, 2018). Adult SEL has been added to teacher education in Mexico for several years; however, it has largely remained theoretical, lacking practical skills training for educators (Chernicoff et al., 2025; García Pérez & Garza Ruíz, 2022; Reyes Díaz et al., 2022). Some Latin American scholars advocate for a “pedagogy of interiority” in teacher SEC development, focusing first on self-knowledge before extending outward (Domínguez, 2018). Thus, future adult SEL programs need to address this gap between theory and practice by developing relevant curriculum that provides tools and strategies for the development of preservice teachers' social-emotional competencies for self and students (Schonert-Reichl, 2017).

2. Preservice teachers' SEC and wellbeing

Most prior approaches involving contemplative experiential learning for PST SEC development have used mindfulness-based interventions (Cochran & Parker Peters, 2023; Gidalevich & Mirkin, 2024; Hirshberg et al., 2020; Jennings et al., 2011; Markowitz & Bouffard, 2025; Weemer & Wodika, 2023). Research on such approaches is growing, but is still in a nascent state (Hadar & Ergas, 2022). A literature review by Levendusky and Crippen (2025) of mindfulness-based interventions in preservice education found that such interventions are promising, and can play an important role in enhancing preservice teachers' emotional resilience and wellbeing, potentially mitigating burnout, attrition, and improving student outcomes. At the same time, these authors also acknowledge that the variable implementation modalities of such mindfulness interventions in PST make it challenging to clearly summarize the effectiveness of these programs.

The most rigorous study of preservice teachers to date included in the Levendusky and Crippen (2025) review was conducted by Hirshberg and colleagues (2020). In a cluster randomized controlled trial of a

mindfulness and connection (i.e., loving-kindness, compassion practices) intervention with 98 Early Childhood preservice teachers, they found limited evidence for program benefits on preservice teacher wellbeing, but significant improvements in treatment teachers across all three major domains of the Classroom Assessment Scoring System (CLASS)—instructional quality, emotional support, and classroom management (Pianta & Hamre, 2009). They also found rates of early career attrition from teaching three years later were significantly reduced in the treatment group (Hirshberg et al., 2020).

A second relevant study not included in the Levendusky and Crippen (2025) review was that of Jennings et al. (2011) who studied the CARE program with preservice teachers. The intervention included both mindfulness training and SEL content around emotion (e.g., learning “imported scripts” that affect our perception of events). The study showed limited impacts. For instance, CARE treatment group showed significant impact on self-reports of their capacity to create autonomy-supportive classroom environments for student learning ($p < .05$) compared to controls at post-test, with additional pre-post improvements in self-efficacy and mindfulness observing skills. The program's impact on reducing negative affect was non-significant.

Although not widely studied, it appears that mindfulness and compassion practices may operate on different mechanisms (Conversano et al., 2020; Dahl et al., 2020) and there is a particular scarcity of studies examining compassion-based programs. This is important because most teachers enter the teaching profession based on a compassionate motivation to help students to learn and thrive (Bartanen et al., 2025; Watt et al., 2012). Thus, programs that sustain this altruistic motivation may potentially mitigate teacher burnout, attrition, and improve student outcomes. Building PST skills in compassion and self-compassion may build resilience to challenging aspects of the profession, and improve classroom behaviors by making students more empathic, compassionate, and kind.

In response to the need for a more experiential approach to teacher SEC development through compassion-based SEL, a compassion-based SEL program was developed for implementation in Mexico. This included a three-course sequence. The first course, evaluated here, was based on the CBCT® (Cognitively Based Compassion Training), a secular compassion training program for adults previously evaluated in research (Desbordes et al., 2012; Mascaro et al., 2022; Pace et al., 2012). The CBCT-based course aims to cultivate intrapersonal SECs such as attentional control, meta-awareness (awareness of one's own mental processes and thought patterns), self-compassion; and interpersonal SECs such as perspective-taking, empathy, and gratitude. The course adopts a skill development approach grounded in the theory that compassion and its attendant skills are trainable rather than fixed traits (Dahl et al., 2020; Davidson et al., 2012). This is achieved through training PSTs in contemplative reflection and meditation techniques drawn selectively from the full CBCT curriculum (Ash et al., 2021), such as the Interdependence Drawing Activity and Connecting to a Moment of Nurturance. Following this foundational course in PST SEC development, the second course provides more didactic learning about the science of SEL and introduces the SEE Learning (Social, Emotional, and Ethical Learning) framework and curriculum. SEE Learning is a preK-12 SEL curriculum. The third course is a practicum in which PSTs deliver SEE Learning lessons in elementary schools with ongoing mentorship from experienced teachers (see Fig. 1). This graduated approach hypothetically allows teachers to develop their own SECs and wellbeing as a foundation for skillful implementation of student SEL programs (Roeser, 2016).

Fig. 1 illustrates a pedagogical model on how these three courses are systematically aligned to prepare what different scholars have referred to as the three domains of ‘SEL-ready teachers’ (Hon et al., 2023) or ‘Educator SEL’ (Elbertson et al., 2025). These domains include preparing teachers who are (1) resilient to the daily stressors of the teaching profession, (2) can deliver direct instruction on SEL to students, and (3) utilize key SEL skills and concepts in their teaching practices.

Like other evidence-based programs for educators (Hirshberg et al.,

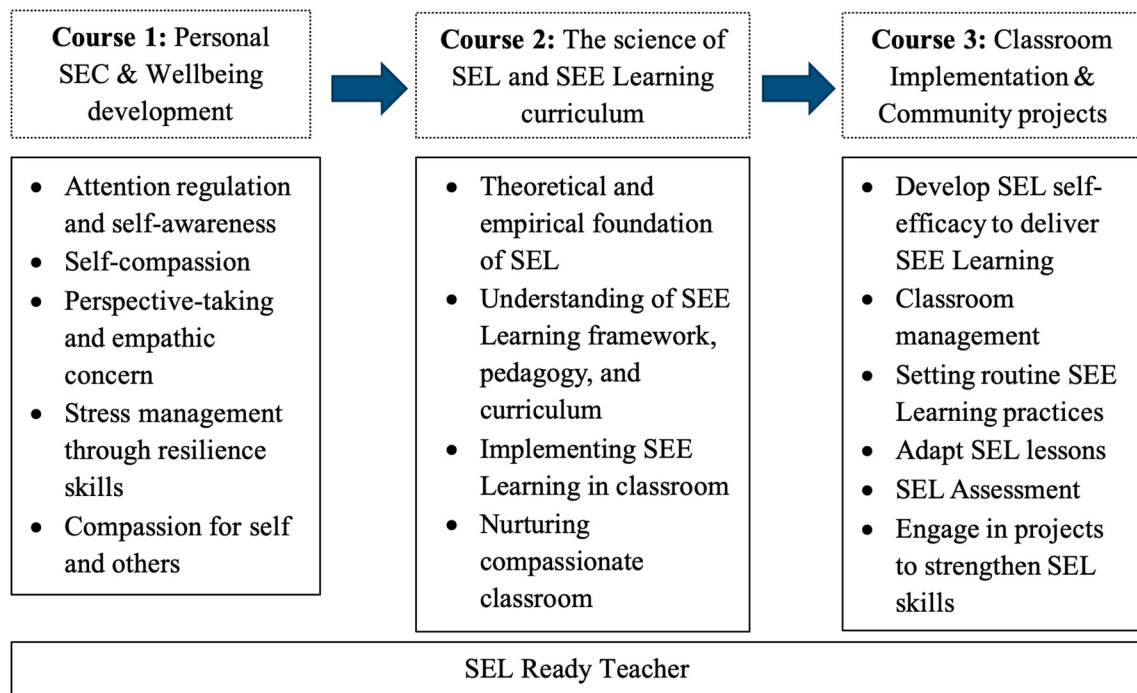


Fig. 1. Pedagogical model for preparing SEL ready teachers.

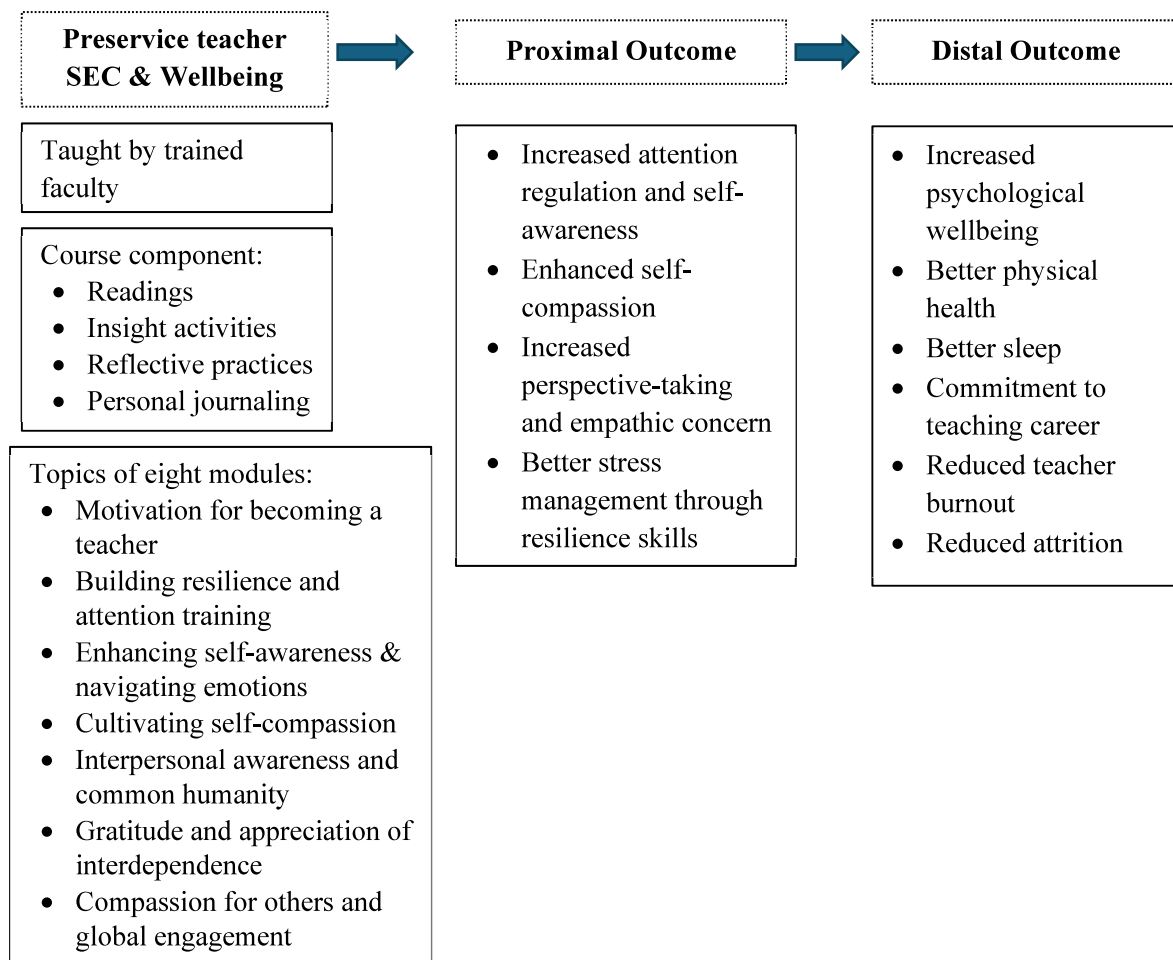


Fig. 2. Theory of change for preservice teacher SEC and wellbeing course.

2020; Jennings et al., 2013), the CBCT program incorporates foundational mindfulness practices including focused attention and non-judgmental awareness. However, CBCT differs in its primary emphasis and pedagogical approach in several key ways: (a) it employs a relational rather than individualistic framing, emphasizing improved relationships with others and positive perception of oneself, rather than focusing on individual stress reduction; (b) it positions compassion as a central focus rather than as a peripheral element or distal outcome; (c) and it emphasizes critical thinking via analytic meditations—a technique of systematic mental investigation of concepts such as common humanity and interdependence to develop personalized insights and to accelerate a shift from conceptual to embodied understanding. These design features align with emerging evidence that compassion training may facilitate earlier engagement and impact compared to attention-training programs alone (Goleman & Davidson, 2018).

In 2023, we piloted the resulting curriculum in one teacher college in the northern Mexican state of Coahuila (referred to as *Escuelas Normales*). We found that the three-course model was feasible for Mexican teacher colleges. In addition, PSTs reported high satisfaction with the course as well as gains in SEC (e.g., positive peer relationships). Based on these promising early results, we conducted this quasi-experimental study to evaluate in greater depth the impacts of the first course—which is focused on the strengthening of PSTs own SECs—in 6 *Escuelas Normales*. Using our theory of change (Fig. 2) to guide research questions, we explored two primary research questions:

1. Research Question 1 (Implementation Quality): Was the course implemented with high quality, as evidenced by PST perceptions of course responsiveness to their needs, instructor competence and embodiment of content, and overall acceptability as a satisfying learning experience?
2. Research Question 2 (Impact on PSTs): Did the course impact change in preservice teachers' social-emotional competencies over time compared to a group of propensity-score matched controls?

Fig. 2 illustrates the theory of change for how the CBCT-based course develops preservice teachers' Social-Emotional Competencies (SEC) skills. The intervention consists of trained faculty delivering an eight-module curriculum combining readings, insight activities, reflective practices, and personal journaling. The modules address critical competencies including resilience, attention control, emotion regulation, self-compassion, interpersonal awareness, appreciation of interdependence, gratitude, and compassion for others.

Through this structured learning experience, preservice teachers are hypothesized to develop proximal outcomes: increased attention, emotional regulation, self-awareness, enhanced self-compassion, improved perspective-taking and empathic concern, and better stress management through resilience skills. When practiced over time, these competencies are hypothesized to lead to distal outcomes benefiting both individual preservice teachers and the broader educational system with increased psychological well-being, better physical health and sleep quality, strengthened teaching career commitment, reduced burnout, and decreased attrition rates. This theory of change posits that by nurturing the holistic development of preservice teachers' through addressing their personal and professional needs—we can create a foundation for sustainable, compassionate, and effective future teachers, ultimately benefiting students, schools, and society.

3. Methods

3.1. The teacher colleges (*Escuelas Normales*)

The study participants were from six different teacher colleges referred to as *Escuelas Normales* (Normal Schools). Students typically enroll to *Escuelas Normales* directly from *preparatoria* (upper-secondary school) at approximately 18 years old, and then pursue a four-year

undergraduate degree (*Licenciatura en Educación*) with subject-specific concentrations such as primary education, preschool, English, physical education, special education, or secondary content disciplines.

The program at the *Escuelas Normales* integrates rigorous pedagogical theory with hands-on classroom experience beginning in the first or second year. Students complete field placements primarily in local public schools. Their comprehensive curriculum encompasses pedagogy, child and adolescent development, Mexican history, civic education, and community-centered teaching approaches. Standardized national frameworks ensure consistency across all *Escuelas Normales*, while also maintaining a strong focus on professional ethics, values, and teachers' societal responsibilities within Mexican culture. Upon successful program completion, graduates traditionally receive automatic teaching certification; though, recent educational reforms have introduced national assessments like CENEVAL for teacher placement and evaluation.

3.2. Participants

Participants in this study were drawn from 6 *Escuelas Normales* in the northern state of Coahuila. Participants were 424 female PSTs (81.2%), 94 male PSTs (18%), and 4 who didn't provide their gender identification (0.8%). The modal age of PSTs was 18 years ($M = 18.5$, range 18–24). The PSTs were enrolled in four different teacher tracks: *Inicial* (Initial education, for kids ages 0–3), *Preescolar* (Preschool education, for ages 3–5), *Primaria* (Elementary education, for ages 6–11), and *Inglés* (English language education, from preschool to secondary). There were 172 students in Preschool (33%), 303 in the Elementary (58%), 29 in the English (5.6%), and 18 (3.4%) in the Initial education programs. (See Table 1 for more demographic details of the study groups).

3.3. Procedures

After IRB approval for the study was obtained in September, 2023, the first-year cohort entering the six *Escuelas Normales* were invited to participate in this study by a local research affiliate. Local research assistants introduced the goal of this study to all PSTs at the beginning of the semester in the Fall of 2024, prior to the administration of the pre-assessment at each of the teacher colleges. The consent form was provided in Spanish and explained by the local research assistants. All participants provided electronic informed consent prior to participation. No compensation was provided for participation. Two teacher colleges were randomly selected for the treatment group, and four colleges functioned as the waitlist control group. A waitlist control design was employed for ethical reasons, ensuring all PSTs would eventually receive the treatment, while also providing a comparison group for preliminary impact analysis. The post-test survey was administered during the final week of class in the Fall of 2024. Of the propensity-score matched sample, 85.6% completed the post-test survey. In addition, a post-course evaluation survey was administered to the treatment group only, with an 86.5% completion rate. All surveys were administered using Qualtrics.

For programs in the treatment condition, the treatment was delivered in place of an existing non-graded class called *Tutoría*, which supports preservice teachers with content knowledge and student behavioral management. The first course was delivered by faculty of the teacher colleges who completed a three-month training on how to teach the CBCT-based course which included Level 1 Facilitator training in SEE Learning (Sonam et al., 2025).

3.4. Intervention description

The current study focuses on the implementation and preliminary impacts of the CBCT-based first course. This course contains eight modules spread over 16 weeks, with a weekly commitment of 3.5 h that includes 90 min of in-person class session, 60 min of out-of-class reading

Table 1
Participant demographics.

	Full Cohort Treated Group (n = 200)	Full Cohort Control Group (n = 322)	Matched Treated Group (n = 177)	Matched Control Group (n = 177)
Age, <i>M</i> (<i>SD</i>)	18.18 (3.52)	18.70 (5.40)	18.22 (3.03)	18.25 (3.15)
Gender, <i>n</i> (%)				
Male	68 (21.38)	26 (13.00)	32 (18.50)	23 (12.99)
Female	250 (78.62)	174 (87.00)	141 (81.50)	154 (87.01)
Prior Life Adversity	7.55 (6.25)	7.58 (5.99)	7.58 (6.07)	7.46 (5.93)
Prior SEL Experience	1.70 (0.46)	1.47 (0.50)	1.50 (0.50)	1.50 (0.50)
Prior Contemplative Practice	3.42 (0.79)	3.37 (0.82)	3.39 (0.74)	3.40 (0.81)
Physical Health	2.38 (0.88)	2.53 (0.94)	2.51 (0.86)	2.53 (0.96)

Note. *M* = mean; *SD* = standard deviation; SEL = social-emotional learning.

and video watching related to the weekly theme, and another 60 min of personal practice and reflective writing. Importantly, each module includes both mindfulness-based practices (focused attention, body awareness) and compassion cultivation practices (nurturing moment, self-compassion exercises, perspective-taking activities). While the mindfulness components develop foundational skills in attention regulation and present-moment awareness—skills also emphasized in other preservice teacher programs (Jennings et al., 2011)—the CBCT approach extends beyond self-regulation to systematically cultivate other-directed compassion through analytical reflection on interdependence, common humanity, and shared aspirations for wellbeing. The pedagogy is intended to support PSTs in moving from conceptual learning to intuitive knowledge, and ultimately to experiential practice and embodied understanding of different competencies.

To illustrate the flow of the program, we describe one session of the program entitled “Connecting to a Moment of Nurturance”. This session guides PSTs through eliciting feelings of safety by recalling a time (or times) from the past in which they felt safe, comforted, or cared for. Through emotional check-ins, group discussions, guided contemplative practices, and body-based awareness practices, students begin to internalize and sustain experiences of safety and nurturance, laying the groundwork for cultivating resilience and compassion. This personal grounding is the foundation upon which subsequent coursework builds.

In another session on “Exploring Self-compassion,” participants engage in a journaling activity where they recall moments of self-criticism that occurred after their making a mistake. Participants are then guided in a reflection that helps them to recognize that challenges and failures are universal human experiences. This reappraising of mistakes as universal and part of learning helps individuals to move from isolation and harsh self-judgment toward connection and self-acceptance. The session is intended to shift focus to strengths-based awareness through two complementary activities: first, participants individually reflect on a past success and identify at least five personal strengths they employed, noticing how this awareness can serve as an antidote to negativity bias during future setbacks. Second, in small groups, participants imagine being stranded on a deserted island and must identify their unique skills for survival, and then collaboratively create a 30-day survival plan based on the team's collective strengths. These structured reflections and activities are designed to help participants learn that self-compassion involves both recognizing shared humanity in the face of difficulties and actively acknowledging personal strengths and resources, ultimately strengthening their sense of personal agency and capacity to navigate challenges with greater emotional balance and resilience. Table 2 provides the weekly theme of each module.

3.5. Measures

3.5.1. Demographic survey

A 13-item demographic survey captures participant characteristics including age, gender, parental education level, teaching specialization

Table 2

Module theme for preservice teacher wellness course [adapted from (Ash et al., 2021)].

Week	Module	Weekly Theme	Constructs
1	0	Motivation for Becoming a Teacher and Professional Challenges	Intention setting
2	M1	Connecting with Nurturing Moments and Creating a Compassionate Classroom	Security priming
3			
4 – 6	M2	Building Resilience and Developing Stable and Clear Attention	Attention control
7 – 9	M3	Enhancing Self-awareness and Navigating Emotions	Meta-awareness/de-reification
10	M4	Cultivate Self-compassion	Self-compassion
–12			
13	M5	Interpersonal Awareness and Common Humanity	Identification & prosocial motivation
14	M6	Gratitude and Appreciation of Interdependence	Gratitude & connection
15	M7	Compassion for Others and Global Commitment	Affection & empathy
16		Course Summary and Conclusion	

track, teaching as first versus alternative career choice, prior exposure to contemplative practices and social-emotional learning, and frequency of engagement in contemplative practice.

3.5.2. Implementation quality and impact measures

Two different measures were used to evaluate the implementation quality during and after the delivery of the course for the treatment group. First, we implemented a formative feedback survey after completion of each module during the course. Likert scale questions were used in the module feedback survey to assess the content, organization, relevance, and quality of delivery of each module. For each item that assessed these dimensions, we report on the percentage of participants who “strongly agreed” with the statement (see Supplementary Appendix A).

Second, for the treatment group, we administered a post-course evaluation at the end of the semester that assessed PSTs' responsiveness to the course, their perceptions of instructor competence and embodiment of content, and their acceptability of the course. Responsiveness can be defined as the extent to which PSTs are engaged with, receptive to, and interested in the activities and content of the course (e. g., Baelen et al., 2023). We assessed responsiveness in terms of PSTs' (a) recommendation of the course to other preservice teachers (single item) and (b) their valuing of the course in terms of finding the topics enjoyable, interesting, important and useful (mean of 5 items, $\alpha = .87$). For ease of presentation, we present the percentage of PSTs who were likely or highly likely to recommend the course to others, and PSTs who agreed or strongly agreed that they found the course valuable.

Instructor competence is another measure of implementation quality that addresses the level of proficiency the instructor manifests in terms of things like the embodiment of foundational course skills and

knowledge, as well as facility in teaching the course and managing social relationships in the classroom. We specifically assessed PST perceptions of their course instructor in terms of being knowledgeable and effective as an instructor, genuine in terms of embodying the skills of the course, and caring, patient, and trustworthy in social interactions with PSTs (mean of 7 items, $\alpha = .97$). For ease of presentation, we present the percentage of PSTs who agreed or strongly agreed that they found their instructor to have these qualities.

Finally, we measured PSTs' acceptability of the course. Acceptability refers to the degree to which the course was perceived by PSTs as satisfying (Baelen et al., 2023). We measured PSTs' satisfaction with specific elements of the course, including the design and content of the course, the workshops, and the skill of the teacher. We also measured their overall course satisfaction (mean of 5 items, $\alpha = .84$). For ease of presentation, we present the percentage of PSTs who agreed or strongly agreed that they found the course satisfying.

Finally, we asked PSTs a single item to assess if they felt that the course had had a positive impact on their psychological well-being compared to other classes; a positive impact on their relationships and ability to pay attention and be aware; and a reduction in their level of school-related stress (see [Supplementary Appendix B](#)). For ease of presentation, we present the percentage of PSTs who felt the course had a "strong" or "much stronger" impact than other courses on their well-being, and who "agreed" or "strongly agreed" that the course helped them with relationships, awareness, and school stress.

3.5.3. Social-emotional competency measures

In [Table 3](#) we present the SEC measures assessed at pre- and post-treatment, along with example items and sample psychometrics.

3.6. Data analyses

Descriptive data from the implementation quality measures was analyzed with SPSS. For the pre/post impacts analyses, we employed propensity score matching (PSM) to create comparable treatment and control groups, reducing selection bias. This statistical technique identifies control participants who are similar to treatment participants on the likelihood or propensity of being in the treatment condition. Specifically, we used the MatchThem package in R to conduct the nearest neighbor propensity score matching (PSM). In the nearest neighbor approach, one control participant per treatment participant is selected based on the nearest propensity score, utilizing a caliper of 0.20 of the logit of the propensity score. This caliper threshold has been found to minimize mean square error of the treatment effect and reduce nearly all bias in the estimator (Austin, 2011). Alternative approaches were attempted (e.g., genetic matching), but the nearest neighbor approach resulted in the best matching.

All outcomes at baseline as well as participant gender, age, licensure track, prior experience with SEL programs, lifetime adversity, and past frequency of contemplative practice were included in the matching procedure. Because there was a small amount of missing baseline data on some variables (all variables <4.3% missingness), we first used multiple imputation through chained equations to generate 50 complete datasets. We then conducted the PSM procedure as described above on each of the imputed datasets using the default with imputation matching procedure. The original dataset was filtered based on matched ids, with matching variables (e.g., distance) appended to the dataset. The inverse probability of the propensity score was calculated to be used a weight in later analyses.

Following the matching procedure, we estimated a series of random intercept models in which we regressed each T2 outcome score on participants' baseline score on that outcome, age, licensure track, prior SEL experience, lifetime adversity, prior contemplative practice, and an indicator variable for group (0 = control, 1 = treatment), with PSTs clustered within college, weighting on the inverse probability of the propensity score. This so-called doubly robust approach provides

Table 3

Pre-post course outcome measures and alpha at pre.

Measure		# Items	Sample item	α
Sussex-Oxford Compassion for the Self Scale (Gu et al., 2020)		15	"When I'm upset, I try to stay open to my feelings rather than avoid them." "When bad things happen to me, I feel caring towards myself."	0.90
Multidimensional Assessment of Interoceptive Awareness (MAIA) (Mehling et al., 2012)	Attention	6	"I can refocus my attention from thinking to sensing my body."	0.80
	Self-regulation	6	"When I am caught up in my thoughts, I can calm my mind by focusing on my body/breathing."	0.83
Interpersonal Reactivity Index (IRI) (Davis, 1983)	Perspective-taking	7	"Before criticizing somebody, I try to imagine how I would feel if I were in their place"	0.79
	Empathic concern	7	"I often have tender, concerned feelings for people less fortunate than me."	0.80
Five Facet of Mindfulness Scale (Baer et al., 2006)		15	"I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted." "When I have distracting thoughts or images, I am able just to notice them without reacting."	0.63
Pemberton Happiness Index (Hervás & Vázquez, 2013)		11	"I am very satisfied with my life." "My life is full of learning experiences and challenges that make me grow."	0.88
General Anxiety Disorder (Spitzer et al., 2006)		7	"Feeling nervous, anxious or on edge" "Feeling afraid as if something awful might happen"	0.89
RAND Physical health (Hays et al., 1993)		5	"I am somewhat ill." "I am as healthy as anybody I know."	0.79
Pittsburg Sleep inventory (Buysse et al., 1989)		5	"During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?"	0.55
Youth and Child Adversity Scale (Schlechter et al., 2021).		8	"A death of a very close friend or family member?" and "Did you ever see your family being the victim of violence?"	0.74

Note. From the MAIA scale, we selected items measuring attention and self-regulation; from the IRI, we selected items measuring perspective-taking and empathic concern.

unbiased estimates of average treatment effects even when the matching or modeling procedure is mis-specified. We retained all covariates because in nested model comparisons, fit statistics consistently showed the added parameters significantly improved model fit. We used false discovery rate correction—a statistical correction for multiple

comparisons that controls the expected proportion of false positives—across the 12 inferential tests to ensure the false positive rate did not exceed 0.05. We report an effect size equivalent to Cohen's *d* that was derived from the model following the principles of Feingold's approach (Feingold, 2009).

4. Results

4.1. Research question 1 (implementation quality)

4.1.1. Formative feedback by module

Module feedback analysis showed consistently high implementation quality across all seven training modules, with all indicators maintaining above 70% strongly agree responses throughout the semester (red dotted line in Fig. 3). Overall implementation quality ranged from 85% in M1 to 75% in M7. Three distinct patterns of change emerged across the ten measured dimensions.

Stable indicators. Participants' ratings of the course organization (item 1) were strong across modules, ranging from 90 to 92% in early modules (M1–M3B) to 82–84% in later modules (M6–M7). Understanding of material (item 6) remained consistently high, fluctuating within a narrow 72–80% range across all modules.

Declining indicators. Participants ratings of the instructor competence showed both stability and gradual decreases across modules. For instance, ratings of instructor knowledge (item 3) declined from 89% (M1) to 78% (M7). Similarly, perceptions of the instructor as a role model (item 4) declined from 90% (M1) to 72% (M5) to 74% (M7). In terms of participants' ratings of the course content, we found similar patterns. Course usefulness (item 7) decreased from 86% (M1) to 72% (M5) to 78% (M7); while course importance (item 9) declined from 83% (M1) to 72% (M5) to 76% (M7).

Variable change indicators. Participants' ratings of their personal engagement in the course showed the greatest fluctuation across modules. Personal connections to content (item 2) dropped from 88% (M1) to 60% (M3), and then fluctuated between 60 and 72% in subsequent modules, and ended up at 70% (M7). Topic interest (item 8) declined from 86% (M1) to 60% (M3), then increased to 79% (M7). Topic enjoyment (item 10) showed similar patterns, declining from 77% (M1) to 63% (M3) and recovering to 73% (M7).

Feeling safe to share personal experiences (item 5) started at 71%

(M1), decreased to 56% (M5), and increased to 65% (M7), representing a net 6-point decline from baseline. Despite fluctuations, most PSTs maintained strong agreement across all dimensions throughout the training.

4.1.2. PST perceptions of the quality of implementation

In the post-course evaluation, we asked the PSTs in the treatment group to respond to their perception of quality of implementation and course impact on them. Results showed that 96% of the preservice teachers would recommend the personal well-being course to other preservice teachers. We also found that 84% of PSTs found the course valuable, 82% found the instructor competent, and 78% found the course satisfying (see Fig. 4).

4.2. Research question 2 (impacts on PSTs)

4.2.1. PST perceptions of course impacts

Based on post-course evaluation, 96% of the PSTs felt the course had an impact on their wellbeing compared to other courses; 84% reported a positive impact on their relationships; 73% reported a positive impact on their ability to be aware and pay attention; and 52% said the course helped them to reduce school-related stress (see Fig. 5).

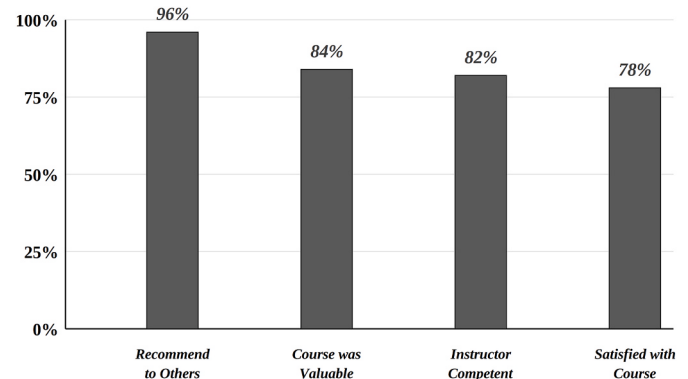


Fig. 4. PSTs' perceptions of the quality of implementation of the course: Responsiveness, instructor competence and acceptability.

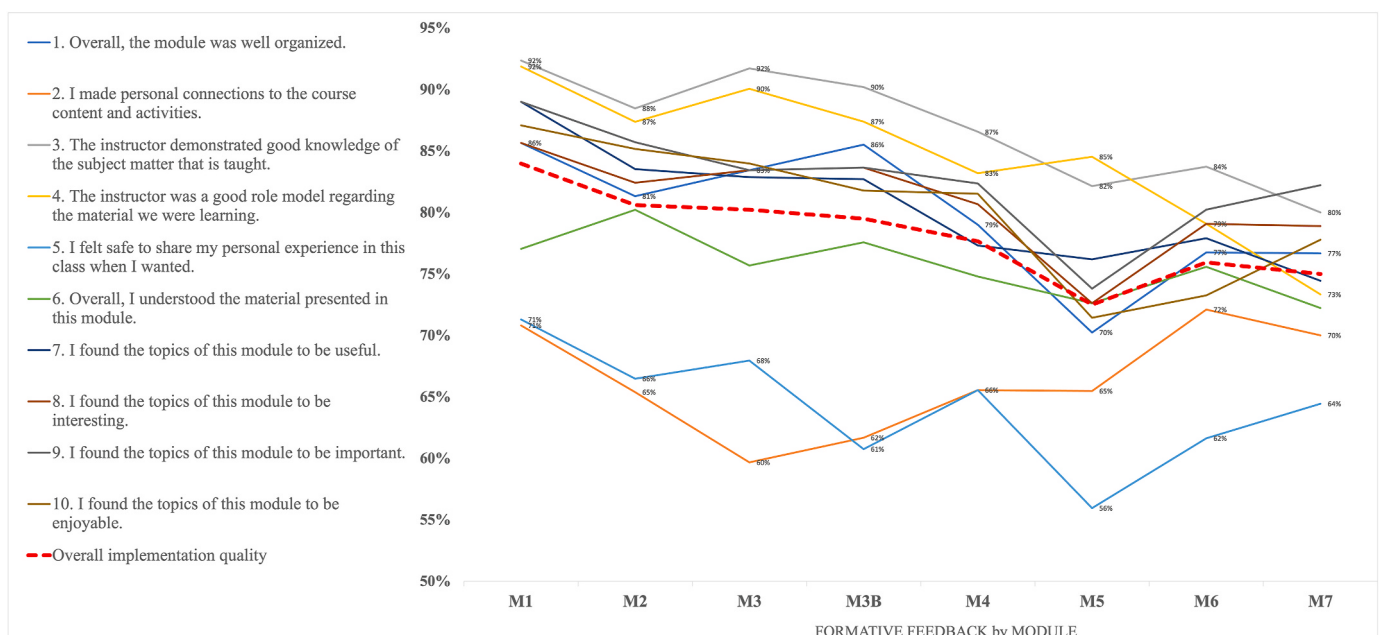


Fig. 3. Implementation quality by module: Percentage of participants indicating "strong agreement".

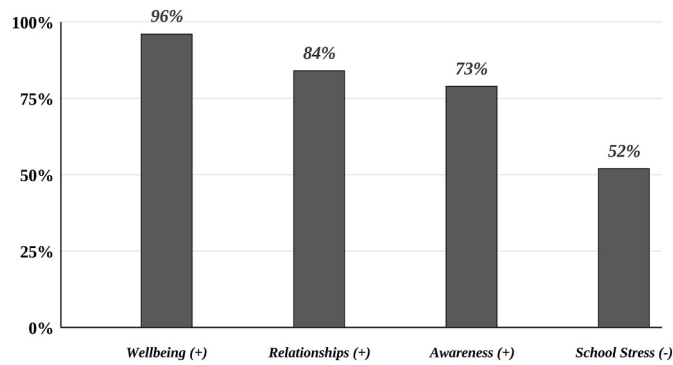


Fig. 5. PSTs' perceptions of the personal impacts of the course: Wellbeing, relationships, attention and awareness and school stress.

4.2.2. Course impact on PSTs' SEC outcomes

The PSM procedure resulted in an excellent match by standard benchmarks (Table 3). Visual plotting confirmed successful matching (Fig. 6). 177 of the 200 original treatment group PSTs and 177 of the original 322 control group PSTs were retained.

In impact analyses (see Fig. 7), we observed statistically significant group differences favoring the treatment group at post-treatment on perspective-taking ($SMD = 0.39$, 95% CI [0.16, 0.64], $p_{FDR} = 0.005$) and empathic concern ($SMD = 0.28$, 95% CI [0.14, 0.41], $p_{FDR} < 0.001$).

These effect sizes, in the small-to-moderate range, represent meaningful practical differences: the average treatment participant scored higher on perspective-taking than approximately 65% of control participants, and higher on empathic concern than approximately 61% of control participants. For preservice teachers, these gains suggest enhanced capacity to understand students' viewpoints and respond with appropriate care—competencies directly linked to high-quality teacher-student relationships and classroom climate.

We observed small magnitude, statistically not-significant effects, favoring the treatment group on self-compassion ($SMD = 0.25$, 95% CI [-0.03, 0.54], $p_{FDR} = 0.222$), flourishing ($SMD = 0.16$, 95% CI [-0.03, 0.34], $p_{FDR} = 0.222$), self-regulation ($SMD = 0.15$, 95% CI [-0.03, 0.34], $p_{FDR} = 0.222$), and sleep quality ($SMD = 0.12$, 95% CI [-0.03, 0.26], $p_{FDR} = 0.222$). While not reaching statistical significance, the positive direction and small-to-moderate magnitude of these effects—particularly for self-compassion—suggest potential benefits that may emerge with extended practice or become detectable with larger sample sizes. Treatment effects on all other outcomes favored the treatment group but were very small in magnitude and statistically not significant (mindfulness $SMD = 0.03$, 95% CI [-0.21, 0.28], $p_{FDR} = 0.810$; attention regulation $SMD = 0.02$, 95% CI [-0.30, 0.35], $p_{FDR} = 0.899$; health $SMD = 0.10$, 95% CI [-0.22, 0.41], $p_{FDR} = 0.529$; & sleep quantity $SMD = 0.05$, 95% CI [-0.20, 0.10], $p_{FDR} = 0.657$).

Unexpectedly, we observed a small, statistically non-significant increase in average anxiety levels in the treatment group relative to

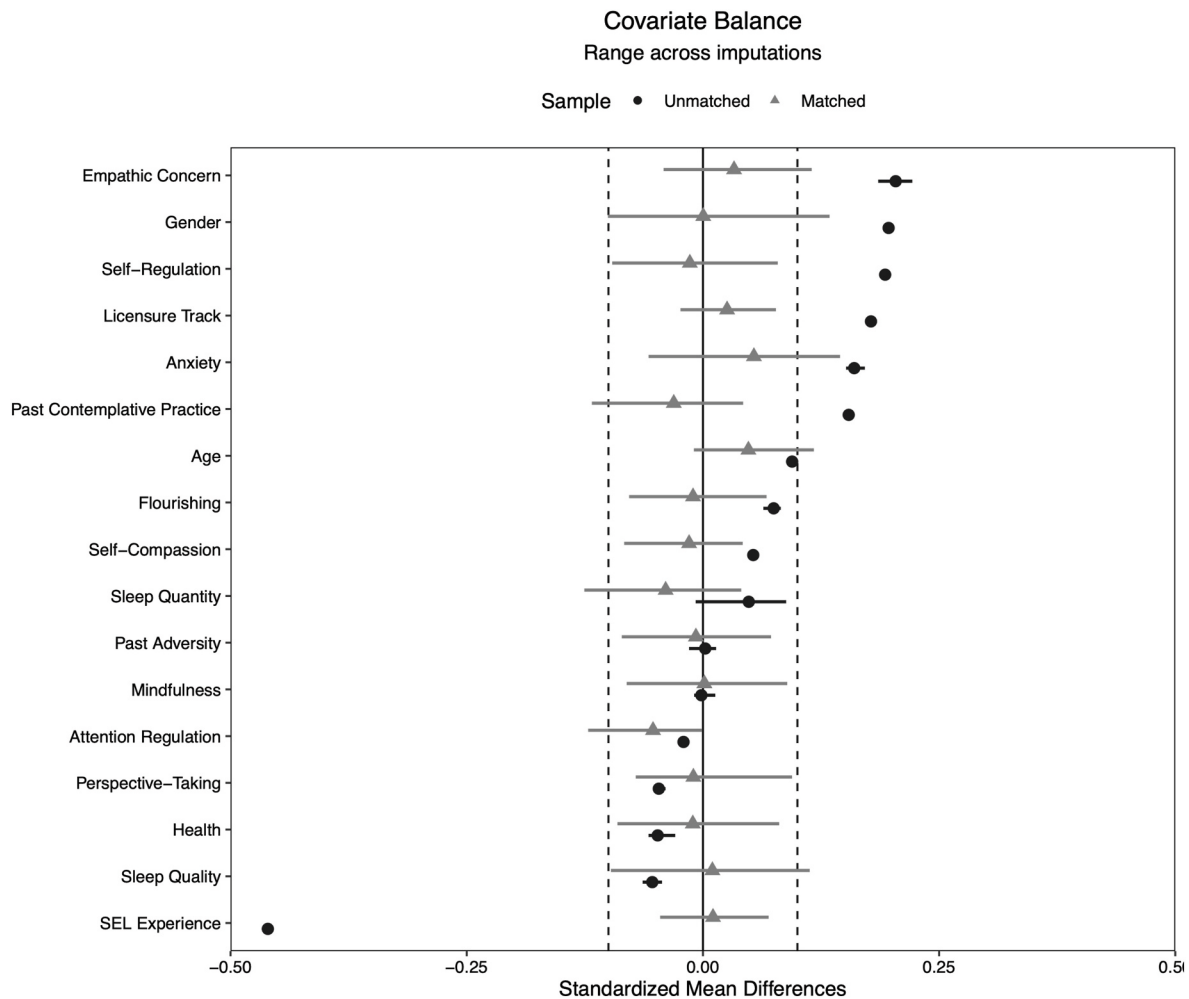


Fig. 6. Love plot of post propensity score matched balance.

Note. Love plot showing the standardized mean difference between the treatment and control groups on all outcomes and demographic variables used in the propensity score matching procedure before (circles) and after (triangles) propensity score matching, with confidence intervals.

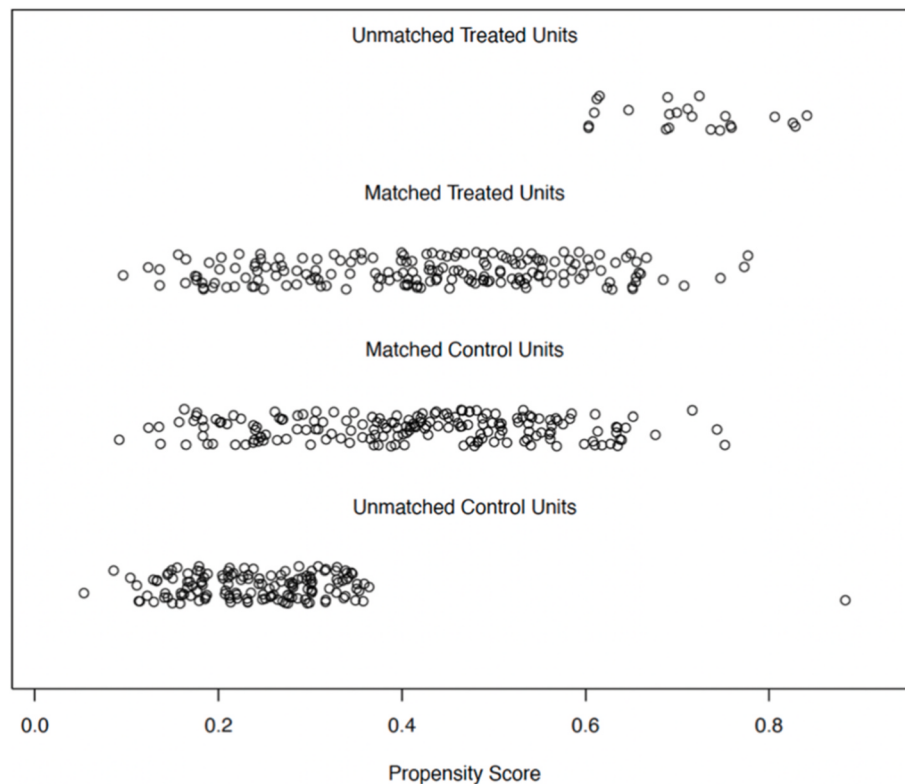


Fig. 7. Distribution of matched and unmatched propensity scores.

Note. Propensity score distributions of the unmatched treatment, matched treatment, matched control, and unmatched control participants (“units”).

controls ($SMD = 0.10$, 95% CI $[-0.22, 0.43]$, $p_{FDR} = 0.657$). Several factors contextualize this finding. First, the effect size is small, and the confidence interval is wide, spanning from a moderate decrease (CI = -0.22) to a moderate increase (CI = 0.43), indicating substantial uncertainty. Second, this pattern may reflect increased self-awareness rather than genuine increases in distress—as PSTs develop meta-awareness through contemplative practice, they may become more attuned to anxiety they previously did not recognize or report (Britton et al., 2021; Lindahl et al., 2017). Finally, this finding aligns with research documenting that early stages of contemplative practice can temporarily increase awareness of difficult emotions before regulatory skills fully develop (Britton et al., 2021). Given the non-significant result and wide confidence intervals, this finding should be interpreted cautiously and examined in future research with longer follow-up periods that allow time for emotion regulation skills to consolidate.

5. Discussion

5.1. Overview of key findings

Despite growing recognition of the importance of teacher SEC for effective SEL implementation, few programs systematically develop SECs in preservice teachers (PSTs). This study addressed this gap by examining both the implementation quality and preliminary outcomes of the CBCT-based course for PSTs. Overall, PSTs reported high quality program implementation, high satisfaction with the course, and significant gains in perspective-taking and empathic concern.

Implementation quality remained consistently high across modules, with PSTs describing the course as well-organized, engaging, and facilitated by competent instructors who created a supportive learning environment. Although all the implementation quality indicators declined modestly (percent strongly agreeing declined 10%–20%) over the semester, this pattern may reflect that course instructors are more prepared for the early modules than the later ones. On the other hand,

maybe as novelty wears off, students perceive courses less favorably. Understanding such cross-time differences in implementation quality better in future research would help clarify such trends. Prior research suggests that “fears of compassion” (Gilbert et al., 2011) and discomfort with vulnerability may contribute to reduced engagement in practice such as self-compassion (Britton et al., 2021; Lindahl et al., 2017), particularly when both PSTs and instructors are still developing their own self-compassion capacities (Roeser et al., 2013).

Post-course evaluations indicated that most PSTs would strongly recommend the course and perceived benefits to their overall wellbeing and relationships, even though impact analyses did not detect significant group differences on several intrapersonal outcomes. In contrast, the most robust and statistically significant effects were observed for perspective-taking and empathic concern—findings that align with the relational emphasis of the CBCT-based curriculum. More modest effects on wellbeing outcomes are consistent with prior mindfulness-based research with PSTs and suggest that intrapersonal SECs may require sustained practice and reinforcement over time before they begin impacting well-being. If this were the case, then it would support our sense of the value of developmentally sequenced, multi-course approaches to preservice teacher SEC development.

These findings align with theoretical models distinguishing compassion training from mindfulness training (Dahl et al., 2020). While mindfulness-based interventions primarily develop attentional and regulatory capacities (Conversano et al., 2020), compassion training explicitly targets relational awareness and prosocial motivation. Our results showing strongest effects on perspective-taking and empathic concern rather than on attention regulation or mindfulness supports Goleman and Davidson’s (2018) proposition that compassion-focused practices may accelerate relational competency development.

5.2. Implication

This study adds to a growing body of evidence demonstrating that

mindfulness- and compassion-based interventions can be implemented effectively across diverse cultural and geographic contexts when appropriately adapted. Successful implementation of this compassion-focused course in Mexico extends prior research by showing that pre-service teacher social-emotional competence (SEC) development can be meaningfully integrated into teacher education programs beyond Western, individualistic contexts (e.g., [Hirshberg et al., 2025](#)). The relational emphasis of the CBCT-based curriculum may be particularly well-aligned with cultural contexts that value interdependence and communal responsibility ([Hofstede, 2001](#); [Watt et al., 2012](#)), suggesting the value of compassion-focused approaches in such context of teacher education internationally.

The findings further suggest that compassion-focused training may produce a distinct profile of outcomes compared to mindfulness-focused interventions, with stronger effects observed for interpersonal competencies such as perspective-taking and empathic concern. This pattern aligns with theoretical accounts of compassion training that emphasize relational awareness and concern for others and supports calls to move beyond primarily intrapersonal models of teacher wellbeing toward more relationally oriented approaches ([Romano et al., 2025](#)). For teacher educators, these findings underscore the importance of selecting adult SEL frameworks that align with intended outcomes, particularly when relational capacities are a central goal. At the same time, it is clear that stable attention and mindful awareness are essential for attending to others with care, kindness and compassion (e.g., [Strauss et al., 2016](#)).

A key practical implication of this study is the feasibility of embedding SEC development within existing preservice teacher education structures rather than treating it as an add-on. Given persistent time constraints in teacher preparation, integrating SEC training into required coursework—particularly early in programs—may support foundational intrapersonal and interpersonal skill development prior to the demands of clinical practice ([Danyluk, 2013](#)).

The pattern of findings also highlights the limitations of single-course interventions for producing sustained changes in preservice teacher wellbeing. While gains in perspective-taking and empathic concern were evident, more modest effects on intrapersonal outcomes suggest the need for multi-course, developmentally sequenced approaches in which skills are revisited and applied in authentic classroom contexts. Short-term or standalone approaches may be insufficient for durable change.

Finally, this study has implications for teacher education policy and standards. Given the current international emphasis on teacher wellbeing and social/emotional skill development ([Liu et al., 2018](#)), these findings provide preliminary support for compassion-focused SEC training in pre-service education. In centralized systems such as Mexico, the results underscore the importance of explicitly incorporating teacher SEC development alongside pedagogical and content knowledge, particularly in contexts where K–12 SEL is already mandated.

5.3. Limitations and future directions

This study has several limitations. First, this was the first implementation of a contemplative-based SEL course at the teacher colleges, which may have affected both faculty effectiveness in delivery and PST embodiment of the content. Although PSTs overwhelmingly found the course well implemented, we anticipate stronger SEC outcomes as faculty become more experienced in teaching contemplative content and as the full three-course sequence is completed. Second, systemic social or cultural phenomena may have influenced outcomes, as all assessments targeted individual-level skills and dispositions without accounting for broader contextual factors (e.g., classroom or school culture effects). Third, the timing of pre/post-test surveys did not account for external stressors such as end-of-semester schoolwork pressures, which may have affected responses in terms of impacts analyses. Finally, inferences about the causal impact of the treatment on outcomes depend on strong assumptions underlying propensity-score matching. Although we

employed a doubly-robust procedure and the evidence demonstrated a well-matched control group, there remains the possibility that unobserved group difference on important, unmeasured baseline variables confounded estimated treatment effects. In addition, the lack of an active control condition and the reliance on self-reported outcomes cannot rule out the possibility that observed effects were placebo or influenced by demand characteristics ([Brenner & DeLamater, 2016](#); [Keefer, 2015](#); [Mauss & Robinson, 2009](#)).

Future research should examine the longer-term effects of compassion-focused SEC development within preservice teacher education, particularly through longitudinal designs that follow PSTs into student teaching and early career teaching. Such studies would help determine whether gains in relational competencies observed in this study are sustained over time and translate into instructional practice, classroom and school climate, and teacher wellbeing under authentic professional demands. Longitudinal work would also allow researchers to examine whether developmentally sequenced, multi-course models yield stronger and more durable outcomes than single-course interventions.

Additionally, future studies should incorporate mixed-methods approaches to better understand the mechanisms through which compassion-focused training influences preservice teachers' SEC development. Qualitative data from PSTs and instructors could illuminate how participants experience emotionally demanding content, navigate vulnerability, and engage with practices such as self-compassion over time. Observational measures, performance-based assessments, core SEL knowledge test, and active comparison conditions would further strengthen causal inference and deepen understanding of how different adult SEL frameworks uniquely shape preservice teacher learning across cultural and institutional contexts.

6. Conclusion

Embedding social-emotional competence development within preservice teacher education offers an important yet underused opportunity to build teachers' competencies from the outset. This study provides empirical evidence that a compassion-focused, CBCT-based course can be implemented in preservice contexts and can meaningfully support the development of key relationship competencies, particularly in perspective taking and empathetic concern.

This initial course constitutes the first component of a deliberately sequenced, three-course model designed to support preservice teachers' SEC and wellbeing skill development over time. The pattern of findings suggests that while relational competencies may be more immediately responsive to compassion-focused training, intrapersonal skills may require sustained practice and reinforcement with authentic teaching contexts. The second and third courses in the sequence are intended to provide these opportunities by placing preservice teachers in classroom settings to apply, reflect upon, and refine their SEC skills.

By positioning compassion-based SEC development as a core component of teacher preparation from the beginning of the training rather than an add-on, this model offers a potentially more viable approach to preparing teachers to implement SEL while also attending to their own wellbeing and occupational health. As teacher education programs increasingly grapple with how to prepare educators for the relational and emotional demands of the profession, this work underscores the value of developmentally sequenced, compassion-focused approaches to SEC development. Continued research—including longitudinal and qualitative studies—will be essential to examine how such models shape teachers' practice, resilience, and effectiveness over time.

CRedit authorship contribution statement

Tenzin Sonam: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. **Matthew J.**

Hirshberg: Formal analysis, Methodology, Software, Visualization, Writing – review & editing. **Bernardo Naranjo:** Resources, Writing – review & editing. **Alejandro Barcenas:** Data curation, Methodology, Project administration, Supervision, Visualization. **Deirdre Hon:** Conceptualization, Resources, Writing – review & editing. **Fernando Barcenas:** Conceptualization, Data curation, Writing – review & editing. **Robert W. Roeser:** Conceptualization, Data curation, Methodology, Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Tenzin Sonam reports administrative support, travel, and writing assistance were provided by Emory University. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.tate.2026.105748>.

Data availability

Data will be made available on request.

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