

# **Positioning Teachers as Informed Agents: A Pilot Study on Professional Learning and Collective Teacher Efficacy**

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## **Abstract**

Despite broad interest in fostering high levels of collective teacher efficacy (CTE), inquiries into the intentional development of CTE through professional learning are scarce in the literature. This pilot study examined whether professional learning that positioned teachers as informed agents in efficacy development increased CTE. The professional learning was intentionally designed to 1) engage participants in learning and enacting the sources of efficacy, 2) examine outcomes associated with high CTE, and 3) apply strategies to grow and sustain efficacy over time. Results indicated a positive impact on CTE within the small volunteer sample. Findings invite further examination of designing professional learning to intentionally enact the four sources of efficacy, to emphasize positive correlates of high levels of CTE, and to develop teacher expertise in efficacy development. Such professional learning approaches that engage teachers as informed agents warrant continued investigation, contributing to the growing body of research on CTE.

*Keywords:* teacher efficacy, collective teacher efficacy, professional learning, professional development, agency

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## Introduction

Collective teacher efficacy (CTE) refers to the shared belief among a group of educators that they have the ability, through their collective efforts, to positively impact student outcomes even in the presence of perceived barriers to learning (Bandura, 1997; Goddard et al., 2004; Tschannen-Moran & Barr, 2004). Bandura (1993) demonstrated that when educators believe their actions can enable all students to learn at high levels, schools serving predominantly minority students from low socioeconomic backgrounds performed at the highest national percentiles in language and mathematics. Evidence that CTE had a greater impact on student achievement than demographic factors sparked robust interest in the construct. In 2016, CTE gained further exposure, particularly among practitioners, when drawing on Eells's (2011) meta-analysis, Hattie identified CTE as the most powerful influence on student achievement in the context of his Visible Learning work (Donohoo et al., 2018). In the most recent Visible Learning work, Hattie (2023) found that CTE is positively correlated with increased student achievement, with an effect size of 1.34. Further, CTE is associated with positive outcomes and productive behaviors for educators, including professional engagement, leadership, openness to innovation, and greater job satisfaction with reduced stress and burnout (Donohoo, 2018). Despite strong evidence that CTE drives student achievement and positive educator outcomes, current research rarely informs teachers about the benefits of high-level CTE or how efficacy develops, leaving them unable to act as informed agents in strengthening CTE.

Professional learning designed to enhance teacher efficacy and make evident both the mechanisms and importance of its development offers a pathway to informed agency, directly addressing this research gap. By gaining expertise in the sources of efficacy, examining outcomes associated with robust efficacy, and applying those strategies to grow and sustain efficacy over time, educators become informed agents able to make deliberate choices to enhance both their individual and collective efficacy. Informed agency, the capacity to take action grounded in knowledge and context, positions teachers as active participants in their efficacy development. Given ongoing challenges in student achievement and teacher retention, exploring strategies that enable educators to deliberately enhance their collective efficacy is both urgent and necessary.

This exploratory study investigates whether professional learning that engages teachers as informed agents in understanding and applying the sources of efficacy can foster measurable increases in CTE. Prior research largely measures CTE without providing teachers with insight into efficacy development. In contrast, this study positions teachers as informed agents, engaging

them in professional learning designed to make the process of efficacy development explicit and actionable. This professional learning was intentionally designed to 1) engage participants in learning and enacting the sources of efficacy, 2) examine outcomes associated with high CTE, and 3) apply strategies to grow and sustain efficacy over time. Few studies have focused on the direct development of CTE through professional learning, and none have intentionally educated teachers about CTE. To situate this study within the broader field, the following review examines established correlates of high CTE and recent literature examining CTE and professional learning, providing context for this exploratory work.

### **Literature Review**

An inquiry into efficacy development begins with understanding self-efficacy as the “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p. 3). Perceived efficacy levels are context-specific and can be held by an individual or by a group; groups with high efficacy levels are typically comprised of individuals with strong perceived efficacy (Bandura, 1997). The collective efficacy of a staff is informed by the efficacy beliefs of the individual teachers who make up that staff. Efficacy develops through four sources: mastery experiences, vicarious experiences, social persuasion, and affective states (Bandura, 1977, 1986, 1997). *Mastery experiences* occur when an individual or group sets a goal and, through action, achieves that goal. *Vicarious experiences* emerge from observing or learning about the mastery experiences of others. These individuals or groups must be perceived as peers with similar capabilities existing in like circumstances. *Social persuasion* occurs when a trusted and credible source expresses confidence in the ability of an individual or group to be successful in a course of action and achieve a desired outcome. Finally, *affective states* refer to the emotional and physiological responses that accompany the anticipation of a course of action, such as physical tension, emotional distress, feelings of ease, or perceptions of safety versus fear. These four sources inform the development of perceived efficacy held by an individual or a group. It is through the routine enactment of the sources that self- and collective efficacy develop.

Existing research has advanced understanding of CTE by developing measurement tools and analyzing associated factors; this work has also made evident the value of high levels of CTE. Most studies examine CTE either through its positive outcomes for students and educators or through environmental factors and leadership practices that support its development. Correlational studies show positive relationships between CTE and student (Donohoo et al., 2018; Hattie, 2023) and educator (Donohoo, 2018) outcomes, and research identifies environmental characteristics and enabling conditions, such as goal consensus and supportive

leadership, that educational leaders can cultivate to foster CTE (Hite & Donohoo, 2021). While these studies illuminate key factors and outcomes, they rarely address teachers as informed agents in efficacy development. The existing research provides the basis to explore how professional learning can be designed to engage teachers as informed agents in actively fostering CTE.

Adams and Forsyth (2006) examined the formation of CTE through the contextual variables of school level, school structure, and socioeconomic status using hierarchical multiple regression. They found that these environmental conditions significantly shaped teacher perceptions of control over student outcomes beyond the effect of prior school performance. While their study highlighted the importance of understanding how CTE forms within school contexts, teachers were not provided with information about the sources or development of efficacy, nor were they engaged as active participants in shaping efficacy beliefs. Instead, the researchers framed CTE as a construct largely determined by prior experiences and contextual conditions outside teachers' immediate control.

Similarly, Ross et al. (2004) studied over 2,000 teachers across 141 elementary schools to identify antecedents of CTE, finding that shared goals, collaboration, alignment of plans with school needs, and empowering leadership practices had the strongest influence. They cautioned against policies that undermine teacher ownership and emphasized the value of leadership that supports shared decision-making. Donohoo et al. (2018), along with Donohoo and Katz (2017), further reinforce that high-levels of CTE are linked to stronger school culture, student achievement, and productive teacher behaviors, describing leadership strategies such as collaborative inquiry to support CTE. Taken together, this research demonstrates consistent connections among CTE, environmental conditions, and leadership practices, yet it overlooks the potential of inviting teachers to become informed agents who understand and intentionally cultivate efficacy within their professional contexts.

Recent Australian studies provide insights into how professional learning intersects with the cultivation of CTE. Professional learning often aims to prompt teachers to change their practice. Its effectiveness depends in part on teachers' willingness to act, which relies on strong levels of efficacy. The studies recognize that CTE is critical to achieving the intended outcomes of most professional learning. Several seek to foster CTE through professional learning. These studies provide a foundation for exploring how professional learning can be designed to equip teachers to intentionally foster collective efficacy within their schools.

Stokes and Bruzell (2019) focused on professional learning specific to teachers developing trauma awareness and becoming skilled in trauma-informed positive education (TIPE). The researchers demonstrated awareness of CTE's importance and observed evidence of efficacy development throughout their qualitative data, stating "teachers mentioned that the professional learning enhanced their own self-regulatory capacities, their resilience, and their stamina" (2019, p. 9). In short, the teachers gained mastery experiences in skills they would later teach students. The researchers concluded:

This professional learning in TIPE and subsequent implementation has developed the CTE at this school. The leaders and teachers believed that working together, they could make a difference to the academic and well-being outcomes for their students, even those students from the most disadvantaged backgrounds. (Stokes & Brunzell, 2019, p. 9)

These Australian researchers recognized the role of CTE in the success of TIPE implementation. The gap remains in engaging teachers with the sources of efficacy, examining outcomes of high CTE, and applying strategies to grow and sustain efficacy.

Woodcock et al. (2022) examined the relationship between teacher efficacy and the implementation of inclusionary practices. From a larger sample of 140 primary teachers in New South Wales, they interviewed 41 teachers selected for scoring above the 85th percentile or below the 15th percentile on Tschannen-Moran and Woolfolk Hoy's Teacher Self-Efficacy Scale (TSES). The interview included eight questions on inclusive education. One central question guided analysis: "How are all students included and accommodated in your classroom, and what are some of the strategies that are employed to facilitate inclusion?" (Woodcock et al., 2022, p. 4). The study used thematic analysis, which revealed that while teachers with high-efficacy beliefs and teachers with low-efficacy beliefs equally understood the value of inclusive education, differences emerged in practice. Teachers with low efficacy sometimes employed strategies that challenged inclusion and risked creating opportunities for micro-exclusion (Woodcock et al., 2022). The authors state that, "the study acknowledges that teachers who perceive themselves as highly efficacious are likely to embrace their roles as inclusive educators with greater resilience and examine ways for overcoming challenges in this context" (Woodcock et al., 2022, p. 11). They conclude that strengthening CTE is vital for ensuring all students have access to high-quality, inclusive practices. While the authors did not advocate direct professional learning on CTE, their findings indicate that fostering teachers' efficacy beliefs is key to achieving the intended outcome: implementing inclusive practices effectively.

De Carvalho et al. (2023) note that while CTE enhances student outcomes even when accounting for socioeconomic factors and prior achievement, professional learning rarely focuses on intentionally developing CTE. Their professional learning program in primary mathematics was structured around Bandura's (1977, 1997) four sources of efficacy (mastery experiences, vicarious experiences, social persuasion, and affective states). Although the study details the four sources of efficacy and how the professional learning program activated each source for participating teachers, it does not provide evidence that CTE was explicitly addressed. The authors describe CTE as a promising framework for understanding how and why professional learning works and assessing the impact of professional learning. De Carvalho et al. (2023) go on to recommend that professional learning facilitators use processes and structures, as they did in the professional learning detailed in their study, to activate the four sources. While the study demonstrates the potential of structuring professional learning around Bandura's four sources, the involvement of teachers as informed agents in developing collective efficacy remains an area for further exploration.

Loughland and Nguyen (2020) describe CTE as a validated framework with the potential to guide teacher professional learning. Using a qualitative case study, they examined the impact of a collaborative professional learning model on CTE. The study found strong evidence of mastery and vicarious experiences but limited evidence of social persuasion and affective states. Both social persuasion and affective states merit focus in future professional learning design and research (Loughland & Nguyen, 2020). Loughland and Ryan (2022) observed the work of emerging teacher leaders and sought to identify antecedents of CTE in a professional learning setting. They conducted focus groups and analyzed the data thematically and deductively using Bandura's sources of efficacy. They found that professional learning aligned with best practices, such as collaborative, trusting, and discipline-specific professional learning, is more likely to enhance CTE. Both studies aimed to inform the design and facilitation of professional learning using CTE as their framework, but did not directly engage teachers as informed agents in efficacy development.

In discussing the intentional design of professional learning, it is essential to consider adult learning theory and research on professional learning, which highlight that adult learners are goal-oriented and self-directed (Darling-Hammond et al., 2017; Desimone, 2009; Knowles et al., 2015). By clearly communicating intended outcomes in professional learning, teachers are positioned as informed agents, able to engage with content, implement strategies, and make deliberate choices in working toward the articulated goal. In short, engaging teachers as informed agents in efficacy development aligns with principles of effective teacher learning,

including emphasizing relevance, purposeful engagement, and reflective practice as key mechanisms for promoting agency and sustaining collective impact (Opfer & Pedder, 2011; Guskey, 2000). This further underscores the potential for professional learning that is intentionally designed to enable teachers to be informed and active in shaping their own and their colleagues' efficacy development.

### **Methodology**

This study aimed to gather initial evidence on whether professional learning intentionally designed to engage participants with the sources of efficacy, to explore outcomes associated with high CTE, and to apply strategies to grow and sustain efficacy over time can produce measurable positive effects. Guided by social cognitive theory and focusing on the four sources of efficacy, the study was designed to position teachers to build understanding and agency through an intervention consisting of three in-person sessions, each followed by asynchronous activities. An integrated mixed-methods design was employed, allowing the study to move beyond asking whether the intervention had an impact and gain insight into why it had an impact and how it might be refined for greater effectiveness in future studies. Qualitative data offered context for interpreting quantitative changes, and triangulating these data provided further interpretive support aligned with the study's exploratory purpose of informing future hypotheses and guiding design improvements rather than producing generalizable findings.

### **Participants**

The study invited participation from 20 secondary-level school sites and programs within a large urban school district in the Pacific Northwest. The study was conducted at the initial responding school site, a traditional comprehensive middle school serving students in grades 6-8 with a volunteer group of 13 teachers. The participants represented varied career stages and content areas, providing a range of professional perspectives. The sample size reflected the preliminary nature of the study, balancing qualitative needs for a small, manageable group with quantitative goals to support an integrated mixed-methods approach with concurrent data collection and analysis. The setting offered an authentic context to explore the feasibility of professional learning designed to engage teachers as informed agents in fostering collective efficacy development.

Most study participants were female, with only one male participant. They represented a range of content areas, including language arts (4), social studies (4), science (2), art (1), special education (1), and instructional specialist (1). Most were established teachers. Experience levels included 1 participant with 1-10 years of experience, 1 participant with 11-20 years of

experience, and all remaining participants with 20+ years in the classroom. Eleven participants identified as white, and two identified as other when asked about racial identity.

### **Professional Learning Design**

The professional learning series included three in-person sessions, each with an asynchronous follow-up, designed to explore whether engaging teachers as informed agents in efficacy development could strengthen CTE. The sessions addressed the relationship between student achievement and CTE, understanding and fostering CTE through the four sources, and applying effective practices to grow and sustain CTE over time. In addition to collaboratively developed norms that established how participants would work together, a warm welcome and inclusive close framed each session to cultivate a safe learning space (Collaborative for Academic, Social, and Emotional Learning, 2019), an essential condition for the vulnerability and risk-taking inherent to enacting the four sources of efficacy. Without this intentional work, the affective state of teachers could be a barrier to the successful enactment of the four sources. The series moved participants from foundational knowledge of CTE to practical application, culminating in planning for their ongoing implementation of efficacy practices.

In-person session one opened the series by establishing norms for collaboration among participants. Teachers reflected on their beliefs about the key factors influencing student learning and compared these to evidence from research, fostering awareness of the influence of CTE on achievement. Hattie's Visible Learning research was presented to provide a foundation for understanding evidence-based factors affecting student achievement. In the asynchronous component, participants read a section of the grounding text, *10 Mindframes for Visible Learning: Teaching for Success*, and explored a self-selected topic from a small menu of resources aligned to evidence-based teaching. The primary outcome of session one was for participants to recognize their central role in student learning and understand why CTE's strong effect size is relevant to classroom teachers.

In-person session two focused on understanding CTE, its importance, and the four sources of efficacy. Teachers discussed how fostering CTE could be woven into existing initiatives rather than treated as an additional task. They were then introduced to the Mini Success Analysis Protocol (School Reform Initiative, 2022), which provided structured opportunities to practice conversations that enact the four sources of efficacy. The Mini Success Analysis Protocol allowed participants to highlight mastery experiences and generate vicarious experiences for peers while providing opportunities for peer feedback and interaction to foster social persuasion and generate a positive affective state. During the asynchronous component,

participants applied the protocol with colleagues in their professional contexts to reinforce learning and practice enacting the sources of efficacy.

Session three reinforced the four sources of efficacy as participants engaged in collaborative discussion and practiced using the protocol to support both immediate application and future transfer to similar practices and protocols. In the final asynchronous session, participants reflected collectively to consolidate their learning and committed to specific next steps for enacting efficacy practices in their professional contexts. They were also provided with an opportunity to share feedback to refine the professional learning. Overall, the series integrated knowledge-building with practical application, equipping teachers to act as informed agents who foster both individual and collective efficacy.

### **Data Collection**

The study used concurrent data collection embedded within the professional learning series. Quantitative data were gathered through pre- and post-measures of the *Collective Teacher Beliefs Scale* (Tschannen-Moran & Barr, 2004), which was developed from Tschannen-Moran and Woolfolk Hoy's (2001) *Ohio State Teacher Efficacy Scale*. Qualitative data were drawn directly from participant activities during the professional learning sessions, primarily from participant reflections. This mixed-methods approach provided quantitative evidence of change in CTE and contextual qualitative insights that enriched the interpretation of the results. As an exploratory study, the primary aim was to generate preliminary insight into the potential for further inquiry rather than to yield generalizable findings. All data were anonymized before analysis.

### **Results**

This section presents findings from both quantitative and qualitative analyses to examine whether the professional learning series positively influenced CTE. Results are organized to reflect both measurable outcomes and experiential insights related to Bandura's four sources of efficacy. Quantitative results summarize statistical changes in CTE, while qualitative findings illustrate how mastery experiences, vicarious experiences, social persuasion, and affective states emerged during the professional learning series.

Quantitative data were analyzed using a paired-samples t-test to determine whether participation in the professional learning series produced significant changes in CTE. Qualitative data were coded deductively by the researcher using Bandura's four sources of efficacy as a framework. Coding decisions were refined through repeated review and comparison across data sources to enhance credibility and maintain internal consistency in interpretation. Participant

reflections highlighted instructional shifts and the ways peer interactions, facilitator modeling, affirming feedback, and emotional responses contributed to efficacy development. Framing the analysis around the four sources provided theoretical coherence with social cognitive theory and supported the interpretation of how professional learning may be used to influence CTE. The qualitative findings provided contextual depth to the quantitative results, offering insight into how participants' experiences and perceptions reflected or explained shifts observed in measured CTE.

## **Quantitative**

The data collected from the pre-intervention administration and post-intervention administration of the *Collective Teacher Beliefs Scale* were analyzed to determine the effect of the professional learning series on CTE. On average, participants showed greater CTE following the professional learning series ( $M = 94.54$ ,  $SE = 1.76$ ) than prior to receiving professional learning ( $M = 87$ ,  $SE = 1.56$ ). This difference of 7.54, BCa 95% CI [3.82, 11.25], was significant,  $t(12) = 4.42$ ,  $p < .001$ , and represented a large effect,  $d = 1.227$ . The result indicates that the professional learning series did have a positive impact on the CTE of participants.

## **Qualitative**

The qualitative results highlight participants' voices during the professional learning series, emphasizing the participant experiences that contributed to efficacy development. These reflections illuminate the mechanisms through which the professional learning appeared to influence CTE. Findings are presented through the lens of Bandura's four sources of efficacy (mastery experiences, vicarious experiences, social persuasion, and affective states).

### ***Mastery Experiences***

Mastery experiences are the most powerful source of efficacy, built when teachers connect their actions to successful outcomes. Teachers described moments of success, growth, and effective practice that reinforced their belief in their capacity to impact student learning. Many participants pointed to moments where their teaching practices directly supported student success. Several teachers described how stepping into unfamiliar practices and seeing them work contributed to their sense of growth and competence:

*I have stepped out of my comfort zone and conducted Socratic Seminars, facilitated more small group work, and designed hands-on projects (Joan).*

Others connected the use of assessment tools to evidence of instructional effectiveness:

*I have started using exit tickets/quizzes to check to see how successful I was in reaching the desired lesson objectives (Ted).*

Some noted that visible signs of student learning reinforced their sense of instructional impact:

*Watching students grasp concepts and, in turn, help others is the best positive reinforcement of what and how you are teaching (Julie).*

For some, professional identity was tied to efficacy beliefs, as past successes shaped how they viewed their role:

*Even when we see ourselves as experienced educators, this belief changes everything. We are the change agents (Molly)!*

Teachers also described how adapting instruction to student needs confirmed their effectiveness:

*I never underestimate the learning capabilities of my students. Some students need different ways to demonstrate understanding, and the important thing is that I provide multiple ways to show me their learning (Joan).*

At times, participants emphasized the importance of recognizing influence as central to efficacy:

*Teachers need to realize the impact they make on their students (Mary).*

Others connected student choice and engagement with stronger outcomes, reinforcing a link between their instructional decisions and student performance:

*I think that when a teacher provides an avenue for students to share their learning by giving choice to how that will look, students will perform at a higher level because they are engaged in the activity to share the learning, regardless of interest in the subject (Jill).*

Teachers described how daily instructional practice and responsiveness to student needs contributed to their sense of efficacy. One reflection highlights how ongoing assessment not only informed instructional decisions but also reinforced the teacher's responsibility in adapting practice to support learning:

*In my class, we...assess daily on what students are learning and how to teach it in a more understanding manner. What I have learned...is that I should be looking for how I can engage in a different manner of teaching when students are struggling. It may be all about them, but it's also about how I am teaching and how I am meeting my students' needs (Barbara).*

Teachers also described how their confidence developed through designing and refining instructional practices that actively engaged students in deeper learning. This reflection shows how applying scaffolding and project-based tasks built the teacher's sense of impact, while simultaneously prompting consideration of how to expand strategies to reach an even broader range of learners:

*I scaffold students to build information and then ask them to engage in project-based learning or performance tasks... I am now wondering if there is an even more rounded approach that would meet the needs of even more learners (Jaclyn).*

This example illustrates mastery experience as the teacher reflects on both successes and areas for continued growth. By recognizing that their instructional methods have produced meaningful learning opportunities, while also questioning how to improve further, the teacher demonstrates efficacy built from practice and reinforced through ongoing reflection.

By viewing student feedback as a vital tool for adjusting and refining practice, this reflection highlights how confidence is built through direct engagement with evidence of student learning and the resulting instructional adjustments:

*The power of formative evaluation is the feedback provided from the learner to the teacher (Marie).*

This example illustrates mastery experience because it underscores how teachers grow in efficacy by analyzing feedback from their own classrooms and using it to make effective changes. The teacher's recognition of formative evaluation as a reciprocal process demonstrates the power of practice-based evidence in strengthening instructional decision-making and reinforcing efficacy.

As a whole, these reflections demonstrate how teachers recognized their own successful instructional actions, linking outcomes to their efforts. Such mastery experiences shared in a collaborative setting are central to strengthening CTE.

### ***Vicarious Experiences***

Participants drew inspiration and confidence from observing or hearing about the successes of colleagues. The intentional creation of vicarious experiences allowed teachers to strengthen their own efficacy beliefs by gaining awareness and understanding of their peers' successes. Educators engaged in vicarious experiences through peer interactions and facilitator modeling during professional learning sessions, as well as through stories of real classroom teachers presented in the grounding text, all of which provided accessible models of effective

practice. Exposure to others' experiences provided confidence that similar outcomes were possible for them. Some participants highlighted how structured reflection protocols deepened their understanding of both their own and others' successes:

*I noticed with the Success Analysis Protocol that it forced me to really think through why it worked and what made it work. I also noticed that it really helped me understand my partner's successes at a different level (Jo).*

Others noted that the same protocol encouraged presenters to articulate their practice clearly, offering a replicable model for colleagues:

*As we did the Success Analysis Protocol, I noticed how the presenter really has to break things down into small pieces to help the group truly understand how the success came about...so that they can perhaps try something similar (Rebecca).*

Some teachers gained confidence by seeing specific strategies used effectively across classrooms:

*I noticed that many teachers are using our new PBIS rewards system successfully in their classrooms to motivate student growth (Ted).*

At times, participants pointed directly to colleagues as models of effective instruction, recognizing their influence on shaping personal practice:

*I really appreciated your thoroughness and quality teaching. You were a great model of what I should be doing in my classroom (Jo).*

Teachers also described how observing examples of practice through vignettes reinforced shared understandings of effective instruction. Exposure to these narratives highlighted how educators balanced high expectations with appropriate supports, offering a transferable model of success:

*I noticed that they (vignettes) all seemed to build upon the idea that when teachers have high standards for students and provide support, students can be successful (Jill).*

Here, teachers drew lessons from others' practice. This reflection shows how vicarious experiences provided teachers with concrete illustrations of effective practice, strengthening confidence that similar approaches could yield positive outcomes in their own classrooms. These vicarious experiences strengthened efficacy by providing concrete models of success to adapt in their own classrooms. Through vicarious experiences, teachers internalized a sense that effective

practices were both possible and replicable. Seeing peers succeed under similar conditions expanded their confidence in their own capacity.

### ***Social Persuasion***

Social persuasion occurs when encouragement or expressed belief from a knowledgeable and trusted other influences an individual's confidence in their ability to succeed. This can occur between colleagues, between mentor and mentee, or between teachers and students. Social persuasion strengthens teachers' confidence by providing encouragement or recognition that validates their expertise as educators. The data reveal how educators experienced social persuasion and their understanding of its power.

Teachers reflected on the broader influence of professional learning and collaborative discussion:

*It is always good to have time together with other teachers to share ideas. Having the book as a guide made it even better. I look forward to taking time to dig into the ideas and having more conversations with my co-workers to help me grow as a teacher.*

Here, the encouragement and support from peers reinforce the teacher's belief in their ability to improve. The structured opportunity to discuss ideas, guided by a shared resource, functions as social persuasion by providing affirmation and practical insights. Through collaborative dialogue and shared reflection, teachers draw motivation and confidence from collective input, reinforcing their sense of efficacy. Participants spoke often of social persuasion in the teacher-student relationship:

*I think that as a teacher, if you say that a student isn't capable of doing something, then they won't do it, but if you show them you believe in their abilities, they will meet those expectations and often go beyond (Jill).*

This reflection illustrates how expressing belief in students' abilities can influence performance. By communicating confidence and providing autonomy in learning, teachers use social persuasion to motivate students. The insight also parallels how receiving similar affirmation from mentors or peers can encourage teachers themselves, showing an understanding of how social persuasion operates. Teachers noted the influence of observing colleagues who maintained high expectations for all students:

*It is a very powerful [story] that speaks to the idea that we will get from our students what we expect. High expectations will result in high outcomes, and low expectations will result in low outcomes (Molly).*

This demonstrates social persuasion, as the reflection emphasizes the motivating effect of seeing colleagues believe in student potential, reinforcing the teacher's own sense of responsibility and efficacy while also noting the effect of social persuasion on students. Overall, teachers demonstrated their understanding of social persuasion largely in the context of providing it to students as knowledgeable and trusted individuals, while minimally addressing its influence on their own professional growth.

### *Affective States*

Teachers' reflections reveal that their affective responses to the professional learning sessions positively contributed to their ability to gain efficacy that resulted in agency, or action. Many described feelings of energy, inspiration, and appreciation for the opportunity to reflect and collaborate. For example, one participant noted:

*I loved our sessions, but I feel like one-hour sessions are too quick. I feel like we just get going, and it is over. For me, 90–120-minute sessions would be better (Ted).*

This sense of wanting more time points to a high level of engagement, as teachers were deeply invested in the learning process. Positive affect also came from the pacing and quality of facilitation:

*I enjoyed the pacing of this class, and the instruction techniques were super engaging. All the information we received via handouts/links was very relevant to my day-to-day teaching (Joan).*

Several teachers emphasized how the sessions encouraged deep reflection, sparking both affirmation and new questions:

*Thank you! I enjoyed the collaboration and reflection time. Wow! Very thought-provoking (Molly).*

Finally, participants highlighted the emotional lift of being reminded of their agency and successes as educators:

*I really needed to read this quote because it reminded me that I have had a lot of successes and I have had students succeed on a higher level, which means I have more control over my teaching situation than I previously realized (Jo).*

Taken together, these affective responses suggest that the professional learning sessions were not neutral experiences but emotionally rich. Teachers felt engaged, affirmed, and motivated to reflect more deeply on their practice. These feelings are critical in shaping efficacy

because positive affect can fuel persistence, openness to change, and willingness to take risks, contributing to a renewed sense of professional purpose.

### **Combined Results**

The combined quantitative and qualitative findings illustrate the impact of professional learning intentionally designed to help participants engage with the four sources of efficacy, examine outcomes associated with high CTE, and apply strategies to sustain efficacy. The quantitative results indicate a significant increase in CTE following the professional learning series, with a large effect size ( $d = 1.227$ ). These findings are reinforced by the qualitative data, which provide insight into the mechanisms underlying the observed gains. Teachers described mastery experiences gained through experimenting with new instructional strategies and refining existing practices, vicarious learning from peers and facilitator modeling, social persuasion through feedback and encouragement, and positive affective shifts, including increased optimism and confidence. The alignment between quantitative improvements and teacher reflections reinforces the evidence, showing not only measurable gains in CTE but also the processes through which these changes occurred.

### **Discussion**

The professional learning series positioned teachers as informed agents in their own efficacy development through professional learning intentionally designed to engage participants in enacting the sources of efficacy, examining outcomes associated with high CTE, and applying strategies to grow and sustain efficacy over time. As a result, participants showed measurable increases in CTE, and qualitative data revealed teacher experiences of the four sources of efficacy. These findings raise the question of whether this approach could be an important element in broader efforts to increase CTE and suggest the potential value of further inquiry into engaging classroom teachers in developing understanding and agency to foster CTE.

While these findings offer meaningful insights into the impact of professional learning on CTE, several limitations should be considered when interpreting the results. The small sample size ( $n = 13$ ) and the underrepresentation of male teachers and teachers of color, though reflective of the school's demographics, limit the generalizability of both the quantitative and qualitative findings. Voluntary participation introduces potential self-selection bias, as participants may have been more motivated or reflective than non-participants. The qualitative data relied on self-reported reflections, which may have been influenced by social desirability or participants' perceptions of expected responses. Additionally, the study measured changes in CTE immediately following the professional learning series, so longer-term effects remain

unknown. Finally, the context of a single school or district may limit the applicability of findings to other educational settings. Despite these limitations, the study provides valuable preliminary insights into how professional learning can foster CTE and engage teachers as informed agents in their own efficacy development.

Given the demonstrated positive correlation between high levels of CTE and student achievement, as well as the broad range of positive outcomes and productive behaviors for educators, the question that researchers and practitioners currently face is how robust levels of CTE can be grown and sustained. Existing research addresses the responsibility educational leaders hold in providing enabling conditions for the development of CTE. This study's findings suggest that while educational leaders play a critical role in fostering CTE, significant influence can also be achieved by positioning teachers as informed agents in their own efficacy development.

Successful implementation of policies, frameworks, or curricula requires individuals to enact complex behavioral changes with fidelity. Such changes are most effective when participants possess a sense of efficacy in both the context and in the tools or processes being used. This is an especially important consideration for initiatives that require change in teacher practice to be successful. Therefore, it is reasonable for policymakers and district-level leaders to prioritize proactive or concurrent development of CTE when designing and funding initiatives that involve changes in teacher practice. Professional learning addressing CTE could be implemented either in advance of or embedded within such initiatives to support successful implementation.

This emerging area of inquiry aligns with a call from Tschannen-Moran and Woolfolk Hoy (2001) for expanding research into teacher agency in developing CTE. They highlight several important considerations for future research, including teacher preparation, induction, initial placement, and professional development. While they emphasize the implications of teacher efficacy, their discussion primarily addresses those who study and train teachers and does not examine the inclusion of classroom teachers as active participants in the process. Several studies from Australia demonstrate a high degree of intentionality in fostering and monitoring CTE during implementation processes (de Carvalho, A. et al., 2023; Stokes & Brunzell, 2019; Woodcock, S. et al., 2022). These studies underscore the importance of CTE, which should not be overlooked in any implementation. The research to date implies that direct action to grow and sustain robust CTE should be considered a vital component of organizational efforts, whether focused on continued implementation of established practices or on new initiatives and improvement processes.

Taken together, the quantitative and qualitative findings of this study suggest that professional learning intentionally designed to engage teachers in understanding and enacting the sources of efficacy can meaningfully increase CTE. They also underscore the importance of considering teacher agency alongside supportive leadership actions when designing interventions aimed at strengthening CTE. These findings imply that efforts to strengthen CTE should consider not only the provision of knowledge and strategies but also the creation of opportunities for teachers to engage actively with the sources of efficacy in their own contexts. By foregrounding teacher agency and collaborative reflection, schools may enhance the sustainability of efficacy development and, ultimately, support improved student outcomes. Future research could examine how these approaches function across diverse school contexts, the long-term maintenance of CTE gains, and the specific mechanisms through which professional learning influences both individual and collective teacher efficacy.

### **Conclusion**

Given these findings, educational leaders, especially building-level administrators, might strategically empower teachers to understand and apply the four sources of efficacy in addition to attending to environmental characteristics and enabling conditions. They might also support teachers in leveraging these sources within existing structures and facilitate examination of evidence demonstrating the benefits of high CTE for students, teachers, and the school community. Leaders responsible for implementing change initiatives, including policymakers, district leaders, school administrators, and professional development facilitators, might consider how positioning teachers as informed agents in efficacy development could influence the initiatives they lead. Future research could examine the long-term impact of CTE-focused professional learning on teacher practice and student outcomes across diverse contexts, including rural, suburban, and high-poverty settings. Studies might explore how teacher characteristics, the duration of CTE-focused professional learning, or integration with broader school initiatives influence outcomes. Longitudinal research could track the sustainability of efficacy development and its effects on student achievement over multiple years.

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