

The role of beliefs in teacher candidates' development of self-regulated learning promoting practices

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Abstract

Self-regulated learning (SRL)-promoting practices enhance students' positive academic, social, and emotional development. While effective, these practices are complex and often difficult for teacher candidates (TCs) to learn and implement. This theoretical review presents the benefits and challenges of SRL-promoting practices and examines how TCs' beliefs about SRL are implicated in their development and implementation of these practices. Conditions within teacher education programs that attend to TCs' beliefs about these practices are examined and suggestions are provided for further research in the area of TCs' beliefs and their development of teaching practices that promote SRL.

KEYWORDS

beliefs, self-regulated learning, teacher candidates

Practitioner points

- Self-regulated learning (SRL)-promoting practices foster positive social, emotional, and academic student outcomes.
- Attending to teacher candidates' (TCs) beliefs about SRL within teacher education programs fosters TCs' development of these practices.

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- TCs' self-efficacy to implement SRL practices is fostered through the provision of activities that promote metacognitive thought.

1 | INTRODUCTION

Teacher education programs strive to prepare teacher candidates (TCs) to develop teaching practices that allow students to thrive within diverse and changing contexts. Self-regulated learning (SRL) aligns well with goals and objectives for 21st-century classrooms (Wolters, 2010). SRL refers to ways learners control thoughts and actions to achieve goals (both their own and those set by others) and respond to environmental demands (Zimmerman, 2008). Self-regulated learners are described as productive, focused, persistent, and flexible (Perry et al., 2018). These learners experience improved social, emotional, and academic outcomes in relation to their peers (Blair & Razza, 2007; Cleary & Zimmerman, 2006; McClelland et al., 2007; Rimm-Kaufman et al., 2009; Zimmerman & Schunk, 2011).

Although beneficial, self-regulated learning-promoting practices (SRLPPs) are complex—they take time to understand and develop (Brown & Campione, 1994; Perry, Phillips et al., 2006). In the past, most research regarding how TCs develop SRLPPs has focused specifically on the transmission of SRL teaching strategies and mentoring techniques, with little consideration given to how TCs' beliefs about SRL shape their openness to learning about and implementing SRLPPs. The following theoretical review seeks to highlight the need for teacher educators to consider and attend to TCs' beliefs when supporting TCs to adopt and implement SRLPPs within their practicum classrooms and beyond. To this end, literature from the fields of SRL, teacher, and TCs' beliefs are presented and merged to provide a conceptual model of how teacher educators can support TCs' development of SRLPPs.

2 | SELF-REGULATION AND SRL

Self-regulation is the ability to control and direct emotions, thoughts, and actions toward the achievement of goals in response to environmental demands and considerations (Zimmerman, 2008). The term SRL refers to the metacognitive, motivational, and strategic processes learners use to control, sustain, and direct their behavior and attention while engaged in learning tasks (Zhang & Zou, 2022; Zimmerman, 1990, 2008). Expert self-regulated learners can regulate their behavior, emotions, and thoughts when engaging in challenging learning situations (Hadwin et al., 2011, 2018). They use metacognitive processes to assess learning tasks and then plan, monitor, and adjust their actions in response to feedback while engaged in tasks. They are persistent and motivated to engage in challenging tasks and know how to reach their desired goals. To this end, self-regulated learners develop and use a wide range of learning strategies; they seek feedback; engage in self-reflection, -monitoring, and -assessment; and possess the ability and the will to adapt function flexibility depending on the demands of specific contexts (Perry, 2013; Rohrkemper & Corno, 1988). Conversely, students who struggle with SRL often misinterpret task criteria and fail to effectively plan their engagement within tasks (Beckman et al., 2021; Butler & Cartier, 2004).

Several well-known models of SRL exist, including Zimmerman and Moylan's Cyclical Model; Boekaerts and Cascallar's (2006) Dual Processing Model; Winne and Hadwin's (1998) model of SRL; Pintrich's (2000) Motivational Cognitive Model; and Järvelä and Hadwin's (2013) Socially Shared Regulated Learning Model (See Panadero, 2017 for an in-depth review of these models). While differing in theoretical underpinnings, these models view SRL as occurring in cycles of three general phases: forethought (premeditation), performance (volitional control), and appraisal (self-judgment) and reflection. During the forethought phases, learners premeditate tasks. To this end, they interpret tasks, articulate learning goals, and create a plan to achieve those goals for themselves. They

assess their repertoire of strategies and select which strategies to apply based on the task at hand. During the performance phase, learners engage in volitional control. They utilize motivational strategies to regulate their emotions, overcome challenges, and persist with assigned tasks. They apply learning strategies, monitor their progress, seek feedback and support if required, and revise strategies as necessary. Finally, during the self-reflection phase, learners engage in self-judgment and reflection. To this end, they evaluate their performance, use of strategies, and both their challenges and successes during their engagement in tasks. They then use this knowledge to identify, readjust, and set new goals (Butler et al., 2017).

2.1 | What are the benefits of SRLPPs?

A wealth of research demonstrates that the promotion of SRL improves students' academic, personal, and social functioning in and beyond school settings. In school settings, students' self-regulation is predictive of academic success (Greene et al., 2021; Rimm-Kaufman et al., 2009; Zimmerman & Schunk, 2011), regardless of social economic status and social demographics (McClelland & Wanless, 2012; Vernon-Feagans et al., 2016). It is also correlated with improved working memory (Diamond et al., 2007), literacy and numeracy outcomes (Blair & Razza, 2007; McClelland et al., 2007), and positive development, both emotionally and socially (Cleary & Zimmerman, 2006). Recent evidence also indicates that self-regulating learners report higher perceived self-efficacy for performing tasks (Chen et al., 2022; Ho et al., 2022); are less likely to engage in procrastination (Hong et al., 2021); and spend more time engaging in on-task studying behaviors (Follmer et al., 2022). In sum, learning conditions that promote students' SRL support success in diverse learning, work, and personal contexts.

2.2 | What do SRLPPs look like in classroom settings?

Zimmerman and Pons (1986) early work describes fundamental practices associated with students' development of SRL. These practices include providing an environmental structure within classrooms in which students have opportunities to: (a) develop their metacognitive processes; (b) engage in self-assessment, goal setting, and planning; (c) learn research and note-taking strategies; (d) experience self-consequences; and (e) seek help from teachers and peers. Perry (1998, 2013) and Perry et al. (2018) identify a set of SRLPPs that fulfill these objectives. These researchers identify SRLPPs that include teachers' provision of structural supports (e.g., through task design and instructional strategies); opportunities for students to take control of their learning (e.g., making meaningful choices, controlling challenge, and self-evaluating learning); and timely and targeted teacher and peer support. Through these practices' students' metacognition, motivation, and cycles of strategic action are fostered.

Central to the promotion of SRLPPs are opportunities for students to engage in complex tasks. Complex tasks that require creative and/or critical thinking and problem solving are instrumental in the promotion of SRL (e.g., Kramarski, 2018; Many et al., 1996; Neuman & Roskos, 1997; Perry, 1998, 2013; Perry, Turner et al., 2006; Perry et al., 2017; Samarapungavan et al., 2008). The promotion of complex tasks within classrooms requires that students are provided with learning opportunities to use multiple metacognitive, cognitive, and motivational processes, thereby fostering SRL. Complex tasks span subject areas, involve multiple lessons, require students' active engagement in metacognition and strategic action, support individualized approaches to tasks, and allow for a wide range of responses and products to demonstrate knowledge and understanding (Lodewyk et al., 2009). To facilitate students' involvement in complex tasks, teachers structure learning and behavioral routines. Within complex tasks, opportunities are created for students to engage in cycles of SRL (e.g., forethought, performance, self-reflection). To this end, throughout the task, teachers provide directional, instructional, motivational, and metacognitive support and nonthreatening feedback that enables students to plan and adjust their course of action to meet task and personal goals (Perry, 2013). They act as guides and collaborators. They acknowledge students' autonomy and encourage students to make decisions, create solutions of their own, and

engage in tasks in a way that is personally meaningful (Stafanou et al., 2004). Complex tasks incorporate multiple individualized learning goals (e.g., goals for comprehending, communicating, and subject content). The depth and the extended nature of complex tasks provide students with opportunities to approach tasks at their level of understanding, make meaningful choices (e.g., choice in procedure, resources, product), seek and provide peer support, and time to reflect upon their engagement and performance (Butler et al., 2017). All the above teaching strategies require teachers to be acutely attuned and responsive to students' *individual* motivational and academic needs (Brown & Campione, 1994; Perry et al., 2008). Through these tasks, students can develop multiple, metacognitive and motivational strategies leading to enhanced academic performance—this has been found to be particularly for students with lower prior academic achievement (Theobald, 2021).

2.3 | What do we know about TCs' implementation of SRLPPs?

Although SRLPPs are beneficial, little is known about how TCs develop these practices and promote them in their classrooms (Dignath & Büttner, 2018). Utilizing various observational scales (e.g., Brenner, 2022a; Perry, 1998) multiple researchers have demonstrated that implementing SRLPPs practices in general classroom settings is challenging for TCs and teachers (Brenner, 2022b; Brown & Campione, 1994; Kramarski, 2018; MacMahon et al., 2022; Michalsky, 2014; Perry, 1998; Spruce & Bol, 2015). For TCs, new to the realm of teaching, SRLPPs are particularly demanding. New to the profession, many TCs struggle to recognize when their school mentors are implementing SRLPPs (Michalsky, 2021), thereby hindering their abilities to see the utility of SRLPPs and connect SRLPPs to their most immediate concerns (e.g., classroom management and planning lessons; Brenner, 2020c; Fuller & Bown, 1975; Kyriacou & Stephens, 1999). Furthermore, TCs may be placed in classroom and school contexts where they have limited exposure to models (i.e., school-based mentor teachers) who are effectively applying SRLPPs. In these contexts, TCs have few opportunities to observe the utility of SRLPPs and receive support for their attempts at implementing SRLPPs. In such settings, TCs may question the value and utility of SRL and in turn, hinder their motivation to learn about SRL and implement SRLPPs.

2.4 | How do teachers' and TCs' beliefs shape their development and implementation of SRLPPs?

Few studies have examined teachers' or TCs' beliefs about SRL and their development of SRLPPs. Lombaerts and Engels (2007), Lombaerts, de Backer et al. (2009), Lombaerts, Engels et al. (2009), and Lombaerts et al. (2007) developed three self-report scales to identify teachers' beliefs about SRL, their implementation of SRLPPs, and their perceptions of the support they receive for their promotion of SRL. The Self-Regulated Learning Teacher Belief Scale is a 10-item self-report scale used to assess teachers' personal beliefs about the value of SRLPPs (Lombaerts, de Backer, et al., 2009; Lombaerts, Engels, et al., 2009). The Self-Regulated Learning Inventory for Teachers is a 23-item self-report scale that assesses teachers' implementation of specific SRLPPs in their classrooms (Lombaerts et al., 2007). Lastly, the Self-Regulated Learning Contextual Influence Scale is a 17-item self-report scale that examines teachers' perceptions of support (e.g., support from school, community, and educational policy) for their implementation of SRLPPs (Lombaerts & Engels, 2007 in Lombaerts, de Backer, et al., 2009; Lombaerts, Engels, et al., 2009).

Lombaerts, Engels, et al. (2009) used these scales to examine relationships among 172 Belgian elementary teachers' perceptions of contextual supports for their: (a) implementation of SRL (e.g., presence of a collaborative environment, supportive curriculum), (b) beliefs about SRL (the suitability of SRL practices in elementary schools), (c) past experiences implementing SRL in classroom settings (experiences supporting "individualized learning"), and (d) self-reported use of SRLPPs (providing opportunities for students to engage in cycles of forethought, performance, and reflection). Findings from this work revealed a statistically significant positive correlation between teachers' reported use of SRLPPs and their beliefs about the suitability of these practices in elementary school settings

($r = .37$). In addition, a statistically significant positive correlation was found between teachers' reported use of SRL practices and their past experiences supporting independent learning in their classrooms ($r = .33$). These findings suggest that teachers' beliefs and their levels of experience supporting SRL are related to their use of SRLPPs.

Evidence from Yan (2018) supports Lombaerts, de Backer et al. (2009) and Lombaerts, Engels et al. (2009) findings. Yan investigated 873 teachers' (primary and secondary) beliefs about SRL and their implementation of SRLPPs via a self-report questionnaire. Yan reported that teachers' positive beliefs about the utility of SRLPPs in fostering student learning predicted teachers' self-reported use of SRLPPs. However, Spruce and Bol (2015) found teachers' beliefs and self-reported implementation of SRLPPs were not congruent. Unlike previous studies, the methodology of Spruce's and Bol's study included interviews, surveys, and observations. These instruments allowed for more nuanced results than survey methods alone. The researchers concluded that, although teachers stated they valued SRLPPs, these statements were not aligned with their actual classroom practices. These findings indicate that utility beliefs alone are not predictive of TCs' development and implementation of SRLPPs.

Dignath and Büttner (2018) also investigated how teachers' valuing and understandings of SRLPPs influenced their use of them within their classrooms. Using video observations of teachers with varied levels of experience, these researchers examined how secondary math teachers promoted SRL in their classrooms. Following observations, teachers were interviewed using a semi-structured interview protocol designed to prompt teachers to share their views about SRL. While Dignath and Büttner found teachers used SRLPPs (e.g., provided cognitive strategies, and created learning environments conducive to SRL), very few teachers taught or discussed the metacognitive strategies during their interviews. This was an important finding given that metacognition encompasses learners' awareness and selection of cognitive processes in relation to environmental demands, as well as strategies for planning, execution, evaluation, implementation, and reflection that allow for learners' flexible, optimal engagement within tasks. It is thereby foundational to supporting SRLPPs. While failing to focus on metacognition, teachers in Dignath and Büttner's study indicated that they valued the role of metacognition in promoting SRL. However, they hesitated to actively promote metacognitive strategies within their classrooms due to their lack of knowledge about it. Congruent with the findings of Spruce and Bol, Dignath and Büttner's results reiterated that utility beliefs regarding SRLPPs are insufficient predictors of implementation, rather the role of teachers' and TCs' beliefs about self-efficacy in implementing SRLPPs also needs to be considered.

Indeed, a review of the literature reveals that TCs' beliefs about their self-efficacy to carry out SRLPPs are important predictors of their development and implementation of SRLPPs. Muwonge et al. (2017) examined TCs' motivational beliefs (self-efficacy, task value, and control of learning beliefs) and their implementation of metacognitive teaching practices (subsumed within SRLPPs) in 649 Ugandan TCs. These researchers found that task value (utility beliefs) and self-efficacy significantly predicted TCs' implementation of metacognitive supporting teaching practices. Likewise, De Smul et al. (2018) developed and validated the Teacher Self-Efficacy Scale to Implement SRL. Gathering data from 331 primary school teachers in Belgium, De Smul et al. (2018) found that teachers' self-efficacy was significantly related to self-reported SRL implementation within classrooms ($\beta = .64, p < .001$). Karlen et al. also found a direct and positive relationship between teachers' self-efficacy and their promotion of metacognition. More specific to TCs, Dignath-van Ewijk's path analysis of TCs' SRL beliefs and self-efficacy revealed that TCs who held positive beliefs about SRL indicated higher knowledge of SRL practices and higher self-efficacy for their promotion of SRLPPs. Therefore, as noted by others (e.g., Keller-Schneider, 2014), it is particularly important to provide teachers, and by extension TCs, with learning conditions inclusive of support for their self-efficacy to foster their understanding of SRLPPs.

3 | ATTENDING TO TCS' BELIEFS ABOUT SRL AND SRLPPS

The question of how to provide TCs with forums within Teacher Education Programs (TEPs) to examine their beliefs remains a central topic of research in the field of teacher beliefs (see Chong, 2011; Dignath-van Ewijk, 2016; Irez, 2007; Karavas-Doukas, 1996; Pajares, 1992; Richard Milner, 2005; Spruce & Bol, 2015; Tillema, 2000; Vartuli & Rohs, 2009).

The literature reviewed in this article provides some direction about how to structure TCs' learning environments to address their beliefs about teaching practices. As described, TCs' positive beliefs about teaching practices are linked to their sense of efficacy in implementing them (Muwonge et al., 2017). In turn, self-efficacy is known to be fostered through learners' development of metacognitive skills (Costa Brojato & Labatut Portilho, 2023), in particular, skills related to planning and evaluation of learning. Therefore, it follows that TCs' beliefs are best addressed when they have opportunities to surface and examine unconscious metacognitive strategies (Costa Brojato & Labatut Portilho, 2023; Orakci & Durnali, 2022). TCs' engagement in metacognitive thought supports TCs to develop awareness and control of their knowledge about SRLPPs, in turn fostering their motivation and self-efficacy (Goksu, 2021).

Therefore, when structuring learning environments to attend to TCs' beliefs about SRLPP, opportunities need to be created for TCs to be metacognitive—to learn about, reflect upon, and manage their learning abilities and beliefs (Bjork et al., 2013). Through these opportunities, TCs' are supported in becoming self-regulated learners who can then model the attributes of self-regulated learners for their students. Throughout TEPs, TCs also need time to surface and discuss their beliefs about teaching and SRL (Dignath, 2017; Tillema, 2000; Vartuli & Rohs, 2009). Therefore, scheduled times within TEPs need to be created that offer TCs opportunities to: (a) surface their beliefs, (b) make their pre-existing beliefs explicit, (c) challenge and examine their beliefs, (d) gather and assess new knowledge about practice, (e) reflect on new practices they have observed and tried in their practicum classrooms, (f) apply new knowledge to practice in supportive contexts, (g) reconstruct their beliefs throughout their TEPs, and (h) voice their concerns. These opportunities allow TCs to continually engage in metacognitive thought regarding their practice—to “review, assess, and test their personal systems of beliefs” through cycles of theory, application, reflection, and reconstruction (Cabaroglu & Roberts, 2000, p. 399). In this way, TCs have time to be metacognitive—to thoughtfully develop and integrate new practices and ideas about teaching into their belief systems, providing them with autonomy to determine for themselves the value of specific teaching practices and educational philosophies. This structure allows space for those supporting TCs to become aware of TCs' views of teaching thereby providing them with insight into how TCs interpret and experience learning opportunities. With this knowledge, teacher educators would have a better understanding of how TCs' individual practicum conditions might act to shape TCs' motivation to engage in teaching practices and, in turn, their beliefs and development of teaching practices. In this way, teacher educators are better equipped to tailor TCs' individual learning experiences to encourage the exploration of new theories and practices and challenging assumptions (Tillema, 2000; Vartuli & Rohs, 2009).

The process of Collaborative Inquiry (Butler & Schnellert, 2008, 2012; Heron, 1981) offers a promising framework for TEPs to engage TCs in the process of thinking metacognitively about SRLPPs. Collaborative inquiry establishes a culture of learning and support amongst group members. Within this framework, TCs work with their peers, school mentors, and teacher educators to engage in cycles of inquiry regarding their developing practice. To this end, TCs plan, enact, monitor, assess, and revise goals for their learning and teaching based on their practicum experiences (Butler & Schnellert, 2008, 2012). As described by Halbert and Kaser; and Butler and Schnellert (2008, 2012), during this process, there are multiple opportunities for TCs to engage within metacognitive thought and gain valuable feedback. Throughout the TCs teacher education program, regular meetings are held with all stakeholders (e.g., school mentors, peers, and university personal). During these meetings, TCs work with mentors, instructors, and peers to (a) gather new knowledge about SRL, (b) select a goal(s) for their teaching (in this case related to SRL), and (c) plan a course of action toward their chosen goal(s). Within this collaborative learning environment, TCs gather information through research and discussions with team members in preparation for enacting the teaching goals. With this foundation, TCs then begin to implement practices associated with their inquiry goals within their practicum setting. Their school mentors and university advisors provide TCs with in situ, on-going feedback during their implementation of practices, as well as ongoing opportunities for TCs to discuss, reflect upon, and adjust their practices. In this way, TCs are engaged within their learning at a level appropriate to their current understanding of SRLPPs. Furthermore, they are provided with sufficient time and support to develop and integrate SRLPPs into their existing practices. This gradual, scaffold approach to fostering SRLPPs acts to buoy TCs' self-efficacy and motivation (Voelkel & Chrispeels, 2017) as TCs develop and integrate the challenging practices associated with SRL into their teaching repertoires. It is with this focus on provisions for TCs' own metacognition, motivation, and strategic action that TCs' are provided with the learning context they require to development of positive beliefs about SRLPPs.

4 | SUMMARY

SRLPPs are known to enhance students' positive academic, social, and emotional development. While effective, these practices are complex and often difficult for TCs to learn and implement. Current evidence suggests that TCs' self-efficacy beliefs about their abilities to implement SRLPPs are foundational to their development of SRLPPs. Research indicates that teacher education programs can be structured to foster TCs' sense of efficacy, in turn supporting their development of positive beliefs about SRLPPs by providing transformative learning experiences in which TCs have ongoing opportunities to enhance their own metacognition. One framework, collaborative inquiry is proposed to support this process within TEPs.

5 | FUTURE DIRECTIONS

This review presents many opportunities for future researchers to further examine the role of TCs' beliefs in the development of SRLPPs. Foremost, studies are needed to explore how the characteristics of TCs' learning contexts (inclusive of on-campus classrooms and practicum settings) are implicated in supporting or constraining TCs' sense of efficacy and utility beliefs about SRLPPs. Furthermore, research is needed to identify frameworks for supporting TCs' to develop and engage in metacognitive thought regarding teaching practices they are asked to acquire. Moreover, most research examining TCs' beliefs and their development of specific teaching practices is based on self-report. Therefore, a need exists for future research to incorporate actual observations of TCs' implementation of SRLPPs. Lastly, research is required to further explore the links and direction of associations between TCs' beliefs, self-efficacy, and TCs' learning opportunities.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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