



Empowering EFL Learners: Pre-service Teachers' Strategies for Fostering Self-regulated Learning in Iranian High Schools

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Abstract

The field of Second Language Acquisition (SLA) has increasingly emphasized the importance of learner autonomy and self-regulated learning (SRL) in facilitating deeply effective language acquisition. Recognizing that successful language learning depends not only on instructional methods but also on learners' ability to independently manage their learning processes, this study explored the strategies employed by Iranian pre-service teachers to foster SRL among EFL learners in Iranian high schools. Using a qualitative and exploratory research design, semi-structured interviews were conducted with 30 pre-service teachers from Iran. The findings revealed that Iranian pre-service teachers enhanced learner autonomy through goal setting, reflection, and the creation of independent and supportive learning environments. This underscores the historical and continuing importance of integrating SRL-focused training into teacher education programs, which are crucial for effective and sustainable EFL instruction. The development of these strategies has the potential to significantly benefit both teachers and learners, promoting a learner-centered, autonomous approach to language learning.

Keywords: self-regulated learning, self-regulated strategies, pre-service teachers, teacher education, Iranian EFL learners

1 Introduction

Self-regulated learning (SRL) is broadly understood as a proactive learning process in which learners plan, monitor, adjust, and reflect on their own learning activities (Pintrich, 2000; Zimmerman, 2000). SRL plays a central role in lifelong learning and enables individuals to manage their personal development effectively (de Ruig et al., 2023; Dignath & Veenman, 2021). Research has shown that SRL contributes to positive academic outcomes, supports students' well-being (Cleary & Platten, 2013; Kistner et al., 2010), increases learning motivation (Dignath & Büttner, 2008), and fosters both cognitive and social growth (Wolters, 2011). Scholars recommend that children begin developing SRL skills from early school years onward (Dignath & Büttner, 2008; Montroy et al., 2016; Perry & VandeKamp, 2000), as these skills help prevent ineffective learning habits and support the development of positive academic beliefs (Montroy et al., 2016; Perry, 1998).

Recent scholarship has increasingly emphasized that self-regulated learning is not only a theoretical construct but also a practical competence that can be enhanced through digital and AI-

supported learning environments. In particular, evidence from higher education suggests that AI-powered tools can support metacognitive monitoring, strategic planning, and adaptive control during learning, thereby strengthening learners' SRL processes in ways that go beyond traditional instruction. Such findings are important because they show that SRL is evolving in response to new educational technologies (Xie et al., 2025).

Despite the well-established importance of SRL in modern education, research on teachers' and preservice teachers' competencies and motivation to foster SRL in classrooms remains comparatively limited (Dignath & Büttner, 2018; Perry et al., 2008). In recent years, the focus of SRL research has shifted from directly teaching SRL strategies to students toward preparing teachers to effectively teach about SRL and to integrate SRL-supportive practices into their instruction. Teachers are now expected to guide learners in developing SRL strategies, yet the specific ways in which teachers can support SRL and the instructional methods most effective for doing so are still not fully understood (Dignath & Veenman, 2021; Michalsky & Schechter, 2013).

Strengthening teacher education is therefore essential for helping preservice teachers acquire the knowledge and skills needed to promote SRL. Teacher training programs are increasingly encouraged to include opportunities for preservice teachers to practice teaching SRL strategies, as such preparation can contribute to more academically successful learners and more effective learning environments (Gan et al., 2020; Perry et al., 2007).

Nevertheless, limited research has examined how preservice teachers conceptualize SRL or which approaches they consider effective for supporting students' development of SRL.

However, despite the growing sophistication of SRL models which now integrate metacognitive, motivational, emotional, and social-regulatory dimensions (Panadero, 2022; Hadwin & Perry, 2023) research on preservice teachers' SRL-related beliefs remains narrow and fragmented. Existing studies have primarily examined PSTs' general knowledge of learning strategies rather than the deeper interpretive frameworks that shape their instructional decision-making (Koivuniemi et al., 2023; Lawson et al., 2024).

Since SRL can be observed and supported in diverse classroom situations, further study in this area is necessary. This gap is particularly evident in EFL teacher-education contexts, where SRL is critical for autonomous language learning, yet little is known about how PSTs in non-Western, exam-driven environments conceptualize SRL or translate theory into instructional practices (Teng & Zhang, 2024; Gan et al., 2022). To date, no empirical studies have provided a context-grounded account of how Iranian PSTs understand SRL, which components they prioritize or overlook, and how institutional and cultural factors influence these interpretations. This absence of evidence limits the field's ability to design teacher-education programs that meaningfully prepare PSTs to foster SRL in EFL classrooms. Accordingly, the present study investigates the methods and strategies used by Iranian preservice teachers to promote self-regulated learning among high school EFL students.

2 Literature Review

2.1 Self-Regulated Skill Development

Self-regulated learning (SRL) is widely regarded as a fundamental skill for effective lifelong learning. It involves learners' ability to identify their strengths and limitations, regulate emotions, and

apply strategies to plan, monitor, and evaluate their learning processes (Boekaerts, 1995; Endedijk et al., 2012). A self-regulated learner demonstrates confidence and active engagement in pursuing goals and refining performance through reflective and adaptive strategies (Pintrich, 2000).

Recent conceptualizations emphasize that SRL is not solely an individual cognitive process but also involves motivational, emotional, and contextual dimensions that interact dynamically during learning (Panadero, 2022; Hadwin & Perry, 2023). From this perspective, learners regulate not only their strategies but also their engagement with the social and instructional environment in which learning occurs.

Research emphasizes that motivational and emotional regulation are not innate but learned components that shape one's persistence and strategic control in learning contexts (Wolters, 2003; Bakhtiar et al., 2018). These components indicate that SRL develops dynamically and situationally, depending on how learners choose and apply related strategies (Zimmerman, 2002).

Recent empirical research further suggests that SRL develops through repeated engagement with challenging learning tasks and supportive instructional contexts that encourage goal setting, monitoring, and adaptive strategy use (de Ruig et al., 2023; Glogger-Frey et al., 2022). Such environments allow learners to gradually internalize regulatory processes and become more independent in managing their learning.

Theoretical models conceptualize SRL as a cyclical process encompassing preparatory, performance, and reflective phases (Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 2000). Zimmerman's model has been extended to highlight metacognitive refinement (Zimmerman & Moylan, 2009). In the forethought phase, goal setting and strategic planning represent the task analysis through which learners prepare for learning. Self-motivation beliefs sustain effort during performance.

In the performance phase, monitoring and help-seeking enable progress, while reflection involves evaluating outcomes and adjusting future strategies. Despite these advances, scholars argue that SRL research has increasingly called for greater attention to how regulatory processes unfold in authentic classroom settings rather than controlled experimental environments (Lawson et al., 2024). Understanding how learners actually enact SRL strategies within real instructional contexts therefore remains an important direction for current research.

Recent empirical evidence has highlighted the value of structured SRL-focused training in strengthening learners' regulatory capacities within authentic instructional contexts. Yaşar (2025) demonstrated that when learners particularly those preparing for teaching professions engage in guided SRL cycles involving scenario-based planning, monitoring, and reflection. These findings reinforce the growing argument that SRL development is not automatic but emerges through iterative engagement with well-designed tasks that embed clear regulatory prompts (Yaşar, 2025).

2.2 The Teacher's Role in Fostering Self-Regulated Learning

Classroom instruction plays an essential role in shaping students' capacity for self-regulated learning (SRL). Empirical evidence demonstrates that when teachers embed SRL strategies within classroom tasks, students become more autonomous and reflective learners (Dignath & Veenman, 2021; Pino-Pasternak et al., 2014). Teachers facilitate SRL by providing complex, meaningful tasks that allow

learners to make choices regarding difficulty, environment, or level of scaffolding (Perry, 1998; Perry & VandeKamp, 2000).

Recent studies also highlight the importance of teachers' instructional beliefs and pedagogical knowledge in shaping how SRL is promoted in classrooms (de Ruig et al., 2023). Teachers who possess a deeper understanding of SRL are more likely to design tasks that encourage planning, monitoring, and reflective thinking.

Recent research has focused on training educators to explicitly teach SRL strategies and metacognitive regulation, showing that direct instruction is more effective than creating an implicitly supportive climate (Dignath & Büttner, 2018; Dignath & Veenman, 2021). However, studies also indicate many teachers rarely teach metacognitive strategies and rely instead on indirect methods, limiting students' strategic growth.

Furthermore, emerging evidence suggests that modeling self-regulatory processes such as thinking aloud during problem solving can help students develop metacognitive awareness and learn how to regulate their own learning strategies more effectively (Michalsky, 2023).

Although feedback is a critical component in promoting SRL (Butler & Winne, 1995), it is often underused or too general to stimulate meaningful reflection (Koivuniemi et al., 2021). In summary, existing evidence reveals that educators frequently have limited theoretical and practical understanding of SRL pedagogy (De Smul et al., 2018; Spruce & Bol, 2015), resulting in inconsistent implementation across classrooms.

This gap underscores the need for targeted teacher training that supports educators not only in recognizing SRL's importance but also in applying direct, structured techniques that actively engage students in monitoring and regulating their learning.

2.3 Teacher Training and Strategies to Enhance PSTs' Comprehension of Self-Regulated Learning

The literature consistently highlights concerns about pre-service teachers' (PSTs) limited understanding of self-regulated learning (SRL) and its instructional implications (Dignath & Sprenger, 2020; Lawson et al., 2019, 2023). Because teachers' beliefs strongly shape their classroom practices (Pajares, 1992), examining PSTs' views of SRL is essential for preparing them to meaningfully support students' learning. In response to these concerns, several teacher-education programs have introduced SRL-focused interventions designed to enhance PSTs' own regulation skills and to model how SRL can be integrated into teaching practice (Kramarski & Kohen, 2017; Kramarski & Michalsky, 2010).

Recent research also indicates that PSTs often possess fragmented or surface-level understandings of SRL, frequently associating it with general study skills rather than a comprehensive process involving goal setting, monitoring, and reflection (Koivuniemi et al., 2023). This limited conceptualization may hinder their ability to integrate SRL principles into instructional practice.

Kramarski and Kohen's (2017) intervention, grounded in Zimmerman's (2000) cyclical model, showed that PSTs require explicit scaffolding to develop SRL both as learners and emerging teachers. The findings underscore that PSTs cannot be assumed to acquire SRL skills independently; rather, they need structured opportunities to practice goal setting, monitoring, and reflection.

Similarly, Perry and VandeKamp (2000) found that although beginning teachers value fostering student autonomy, they often lack confidence in determining when and how to provide appropriate support. Their year-long program which combined coursework, classroom practice, mentor guidance, and professional development illustrated that systematic, sustained training can help PSTs develop the pedagogical skills needed to promote SRL in primary classrooms.

More recent teacher education research has therefore emphasized the need for integrating SRL instruction systematically across teacher preparation programs rather than treating it as an isolated topic within coursework (Teng & Zhang, 2024). Such integration can help PSTs develop both personal self-regulation skills and pedagogical strategies for supporting SRL in their future classrooms.

Taken together, these studies suggest that well-designed interventions can improve PSTs' SRL-related knowledge and practices. However, research still provides limited insight into how PSTs conceptualize SRL and what specific support they need to translate SRL theory into effective classroom strategies (Lawson et al., 2023; Michalsky & Schechter, 2013; Perry et al., 2008; Porter & Peters-Burton, 2021). Addressing this gap is essential for strengthening teacher-education programs and ensuring that future teachers are prepared to cultivate SRL in their students.

3 Research Questions

The goal of the study was to investigate the approaches and tactics used by future teachers to encourage self-regulated learning in Iranian high school students who are learning English as a Foreign Language (EFL). The following are the research inquiries:

1. How do pre-service teachers interpret the idea of Self-Regulated Learning?
2. Which specific strategies do pre-service EFL teachers employ to support and enhance self-regulated learning within their classroom environment?

4 Method

4.1 Research Design

A qualitative research design was selected to explore how pre-service teachers (PSTs) understood and interpreted self-regulated learning (SRL). The study aimed to examine the meanings PSTs attributed to SRL, the assumptions underlying their interpretations, and the ways they perceived their role in supporting SRL in classroom contexts. These aims focused on the depth and nuance of participants' subjective experiences rather than the measurement of predefined constructs, which made a qualitative approach particularly appropriate.

Drawing on Lincoln and Guba (1985), qualitative inquiry was considered well suited to studies that sought to understand educational phenomena as experienced and articulated by participants. In this study, such an approach enabled the identification of patterns in how PSTs conceptualized SRL, while also revealing variations that were important for refining teacher-education practices.

4.2 Participants

The research involved 30 pre-service teachers (PSTs) 25 females and 5 males enrolled in Farhangiyani universities in Gonbad-e-Kavous (Golestan province) and Mashhad (Khorasan-e-Razavi province) in Iran. These universities were selected because they represent major teacher-education

institutions responsible for preparing public-school teachers in Iran, thereby providing access to PSTs who were actively engaged in pedagogical coursework related to teaching and learning. Participants were selected using purposive sampling, as they were enrolled in teacher education programs preparing them to become future English teachers in secondary schools. Participants volunteered as part of their teacher-education coursework. Their ages ranged from 21 to 50, and they reported teaching-related experience ranging from 1 year to over 10 years. Many participants had gained preliminary teaching experience through practicum placements, private language institutes, or informal tutoring, which allowed them to reflect on SRL not only as learners but also as emerging teachers. Although this demographic range was broad, it provided an opportunity to capture the perspectives of PSTs at different developmental stages within the teacher-education system.

The inclusion of participants with varied ages and teaching experiences was intentional, as qualitative research values diversity of perspectives in order to obtain richer insights into participants' beliefs and interpretations. To address potential variability, demographic characteristics were not treated as explanatory variables but were examined for their interpretive relevance during analysis. Rather than seeking generalizable patterns based on age or experience, the analysis focused on identifying how participants' diverse backgrounds shaped the meanings they attributed to self-regulated learning (SRL). Instances where age or prior experience appeared to influence interpretations were noted analytically, while themes that remained consistent across demographic groups strengthened the credibility of the findings. This approach allowed the study to leverage diversity as an analytic asset rather than a confounding factor.

4.3 Instruments

The research instrument for this study was a semi-structured interview designed to explore pre-service teachers' (PSTs) understandings and instructional perspectives regarding self-regulated learning (SRL). The interview questions were developed based on established theoretical models of self-regulated learning, particularly Zimmerman's (2000) cyclical model and Pintrich's (2004) framework, both of which conceptualize SRL as a multi-phase process involving planning, monitoring, control, and reflection. The interview protocol consisted of open-ended questions that examined several dimensions of SRL, including PSTs' conceptual understanding of SRL, their beliefs about its importance in classroom learning, their experiences with SRL during teacher education, and the strategies they believed teachers can use to support students' self-regulation. The initial version of the interview protocol was reviewed by two experts in teacher education from Golestan province and SRL research to verify clarity, relevance, and alignment with current SRL frameworks, and minor revisions were made based on their feedback. In designing the protocol, prior qualitative SRL studies that examined teachers' and PSTs' beliefs were also consulted to ensure conceptual relevance and methodological alignment (e.g., Kramarski & Michalsky, 2015; Teng, 2019; Dignath & van der Werf, 2022). These studies provided guidance on how to elicit participants' interpretations of SRL and their pedagogical reasoning. To ensure content validity, each interview question was mapped onto one or more SRL components identified in the literature, such as metacognitive awareness, motivational regulation, behavioral strategy use, and instructional scaffolding. Participants were also invited to reflect on challenges they might encounter when attempting to foster SRL in their future classrooms.

This format allowed participants to elaborate on their experiences and perspectives while ensuring that all interviews addressed comparable core topics. The semi-structured structure therefore

supported both depth and consistency in the data collection process, enabling the identification of shared themes as well as variations in PSTs' interpretations. The full set of interview questions is provided in Appendices A and B.

4.3 Data Collection

The data collection process involved semi-structured interviews with 30 pre-service teachers (PSTs) enrolled in teacher-education programs at the participating universities. Participants were purposefully recruited from these programs and were invited to participate after being informed about the objectives and procedures of the study. Those who agreed to participate signed informed consent forms confirming their voluntary participation and their understanding of how the data would be used for research purposes.

Each interview was conducted individually and lasted approximately 15–20 minutes. The interviews took place in quiet, private locations within the university campuses, typically in an empty classroom, in order to ensure participants' comfort and minimize interruptions. With participants' permission, all interviews were audio-recorded using a digital recorder. The researcher also took brief field notes during the interviews to capture contextual observations that supported the later transcription and analysis of the data.

Prior to the main data collection, the interview protocol was pilot tested with five pre-service teachers who were not included in the final sample. These participants were selected from the same teacher-education programs to ensure that they shared similar academic backgrounds with the target population. During the pilot phase, participants were asked to comment on the clarity, relevance, and comprehensibility of the interview questions. Their feedback indicated that some questions contained overlapping wording and that the sequence of a few questions could be improved to create a more natural flow during the conversation. Based on this feedback, minor revisions were made, including simplifying the wording of several questions and adjusting their order to improve clarity and coherence in the interview process.

4.5 Data Analysis

Following the completion of the interviews, all audio recordings were transcribed verbatim. The transcribed data were analyzed using an inductive thematic analysis approach, following the procedures proposed by Braun and Clarke (2006). This method was selected to allow themes to emerge directly from the data rather than being constrained by pre-existing theoretical categories.

The analysis began with repeated readings of the transcripts to achieve immersion in the data. Initial codes were then generated to capture significant phrases, ideas, or patterns reflecting participants' perceptions and practices related to self-regulated learning (SRL). These codes were subsequently grouped into broader categories, and related codes were compared and refined through an iterative process to ensure consistency and conceptual coherence. From these categories, candidate themes were developed and further defined to represent meaningful patterns across participants' accounts.

Throughout the analysis, attention was paid to both commonalities and variations in how pre-service teachers described their understanding of SRL and its application to classroom teaching. This systematic, inductive process enabled a nuanced and credible interpretation of the data, offering

deep insights into how PSTs conceptualized and enacted SRL within their developing professional perspectives.

To enhance credibility, both member checking and the systematic use of participant quotations were employed. After preliminary themes were generated, a subset of participants reviewed summary interpretations to verify whether the findings accurately reflected their perspectives. Their confirmations led to minor refinements in wording but no substantive changes in interpretation, strengthening the trustworthiness of the results. In addition, the study incorporated direct quotations as low-inference descriptors, allowing participants' own words to serve as empirical evidence for each theme. These quotations anchored interpretations in the data and ensured that the analytic claims remained transparent, grounded, and verifiable.

Dependability was addressed by maintaining a clear audit trail documenting the analytical procedures, including coding decisions, theme development, and revisions made during the iterative analysis process. The coding scheme and category definitions were reviewed by an external qualitative researcher familiar with SRL studies from Khorasan-e-Razavi province to ensure that the analytic process was logical, consistent, and grounded in the data. This external review contributed to strengthening the stability of the findings over time. Conformability was further supported by keeping reflexive analytic memos throughout the study, which helped the researcher monitor potential biases and ensure that interpretations remained closely tied to the participants' accounts.

5 Results

5.1 Analysis of Research Question One

RQ1: How do pre-service teachers interpret the idea of self-regulated learning (SRL)?

The analysis revealed that pre-service teachers (PSTs) conceptualized self-regulated learning as a multidimensional and learner-centered process that involves active responsibility, strategic engagement, and continuous reflection. Their understanding aligned with the core phases commonly identified in SRL models planning, monitoring, and reflection while also integrating cognitive, metacognitive, and motivational dimensions. Three major themes captured the teachers' interpretations: (A) SRL as an active and autonomous learning process, (B) SRL as a set of interconnected regulatory components, and (C) the role of personal academic and teaching experiences in shaping these interpretations.

A. SRL as an Active and Autonomous Learning Process

Participants consistently described SRL as a process through which learners take charge of their own learning by setting goals, making decisions, and evaluating their progress. For many PSTs, the defining feature of SRL was the learner's active involvement and responsibility. As Teacher 1 explained, *SRL involves "students taking control by deciding what they want to achieve and checking how far they have come."* Similarly, Teacher 4 emphasized the cyclical nature of the process, describing SRL as *"planning the work, doing it step by step, and evaluating if it really worked."*

These responses show that PSTs view SRL not as a passive or teacher-controlled process but as one in which learners continuously engage with their goals, strategies, and outcomes. Several

participants highlighted that this autonomy fosters deeper engagement and supports long-term academic growth, particularly in EFL contexts where sustained practice and self-direction are essential.

B. SRL as a Combination of Cognitive, Metacognitive, and Motivational Processes

The second major theme reflected PSTs' recognition of the interconnected components that constitute SRL. Many respondents identified goal-setting, self-monitoring, and reflection as core mechanisms enabling learners to regulate their thinking and behavior. For instance, Teacher 8 described SRL as *"a system of setting goals, watching yourself while learning, and looking back to see what needs improvement,"* capturing all three phases of regulation.

Participants also demonstrated awareness of the metacognitive dimension of SRL. Teacher 7 emphasized the importance of noticing one's thinking processes, stating that *"when students know how they think, they can change their strategies when difficulties appear."* This understanding suggests that PSTs appreciate the role of metacognition in enabling adaptive learning behaviors.

In addition to cognitive and metacognitive factors, teachers highlighted motivational elements particularly self-efficacy and persistence as essential to self-regulation. Teacher 9 noted that *"students who believe they can succeed are the ones who try to regulate their learning,"* while Teacher 11 emphasized motivation as the engine that *"encourages students to take initiative and keep going."* These accounts show that PSTs view SRL as a holistic process that integrates strategic thinking with emotional and motivational regulation.

C. Interpretations Informed by Personal Learning and Teaching Experiences

A distinctive aspect of PSTs' conceptualizations was the influence of their own academic histories and teaching experiences. Many participants explained that their understanding of SRL emerged from challenges they had encountered as learners. Teacher 12 described struggling with time management during university, explaining that *"creating a study schedule was the turning point,"* which helped them appreciate planning and self-monitoring. Similarly, Teacher 18 credited a mentor for introducing reflective practice, noting that *"reflecting after each lesson helped me understand my strengths and weaknesses."*

Experiences from teaching practice also shaped PSTs' interpretations. Teacher 15 described using goal-setting activities with learners during practicum and observing increased engagement, which reinforced their belief in SRL as a beneficial classroom practice. Likewise, Teacher 20 recounted a project-based activity in which students independently managed their research tasks, remarking that the activity *"showed how SRL promotes responsibility and autonomy."* These examples demonstrate that PSTs' understanding is not purely theoretical; rather, it is grounded in practical encounters that reveal how SRL functions in real learning environments.

5.2 Analysis of Research Question Two

RQ2: Which specific strategies do pre-service EFL teachers employ to support and enhance SRL in the classroom?

The analysis revealed four major categories of instructional strategies through which PSTs attempted to support students' planning, monitoring, and reflection three core phases of SRL. These categories included (A) structured goal-setting activities, (B) reflective and metacognitive practices, (C) collaborative learning arrangements, and (D) self-assessment tools and monitoring supports.

A. Structured Goal-Setting Activities (Planning)

Many participants emphasized the importance of helping students establish clear learning objectives at the beginning of a unit or semester. As Teacher 15 explained, goal-setting sessions enabled learners “*to know exactly what they want to achieve and why,*” and provided a reference point for monitoring later progress. Teachers perceived goal setting as a mechanism that increases ownership, direction, and intentionality in learning.

B. Reflective Journals and Metacognitive Prompts (Reflection)

A second strategy involved reflective writing or guided reflection tasks. Teacher 19 described using reflective journals to help learners “*think about how they learned, not just what they learned,*” noting that such reflection encouraged students to identify ineffective strategies and consider alternatives. Participants reported that reflective writing develops metacognitive awareness, helping students evaluate the quality and efficiency of their learning.

C. Collaborative Learning Tasks with Shared Regulation (Monitoring + Co-Regulation)

Several PSTs highlighted group work and project-based learning as effective ways to promote co-regulation of learning. According to Teacher 22, collaborative projects required students “*to set group goals, divide responsibilities, and monitor each other’s contributions,*” thereby fostering accountability and shared monitoring processes. Teachers believed that structured collaboration helps students internalize regulatory skills that later support independent SRL.

D. Self-Assessment Checklists and Progress-Tracking Tools (Monitoring)

Finally, participants reported integrating self-assessment forms, checklists, and progress trackers. Teacher 4 explained that these tools provided “*a concrete way for students to look back on their strategies and decide what needs to change.*” Such tools were seen as scaffolds that guide learners toward evaluating their own work systematically, ultimately supporting the development of autonomous monitoring behaviors.

Despite employing these strategies, PSTs also reported challenges in implementing SRL-related practices. These included differences in student motivation (Teacher 27), time limitations due to curriculum demands (Teacher 23), and students’ unfamiliarity with learner-centered approaches (Teacher 16). These contextual constraints sometimes limited the depth and consistency with which SRL strategies could be used.

Across both research questions, the findings showed that pre-service EFL teachers held a generally positive yet somewhat partial understanding of self-regulated learning (SRL), viewed it as an active, cyclical, and learner-centered process involving goal-setting, strategic engagement, monitoring, and reflection. While their conceptualizations encompassed cognitive, metacognitive, and motivational dimensions, PSTs placed noticeably greater emphasis on planning and monitoring than on deeper reflective and emotional-regulation processes. This uneven understanding was reflected in the instructional strategies they reported using: most PSTs relied on goal-setting activities, collaborative tasks, and basic self-assessment tools, with comparatively limited attention to guided reflection, strategy instruction, or the social dimensions of regulation such as co-regulation and shared regulation.

6 Discussion

The primary objective of this study was to investigate the approaches and techniques employed by pre-service teachers to foster self-regulated learning (SRL) among Iranian high school students learning English as a Foreign Language (EFL). The discussion of the findings was organized around two guiding research questions: how pre-service teachers interpret the concept of self-regulated learning and which instructional strategies they employ to promote and support SRL in their classrooms. By examining both teachers' conceptual interpretations and their reported instructional practices, the study sought to provide a more integrated understanding of how theoretical knowledge about SRL is translated into pedagogical action within the context of teacher education.

6.1 Research Question 1

RQ1: How do pre-service teachers interpret the idea of self-regulated learning (SRL)?

Regarding the first research question, the findings indicated that pre-service teachers demonstrated a general awareness of the cyclical nature of self-regulated learning as described in Zimmerman's (2000) model, which includes the forethought, performance, and reflection phases. However, their explanations revealed an uneven emphasis across these phases. The performance phase was discussed most extensively, followed by elements related to planning in the forethought phase, whereas the reflection phase received considerably less attention. Participants frequently associated SRL with observable learning behaviors such as the use of learning strategies, goal-directed engagement, and self-monitoring during task performance. These aspects were likely emphasized because they are more visible within classroom interactions and more directly connected to instructional practices typically highlighted during teacher preparation.

A closer analysis of the data suggests that the limited attention to the reflection phase may be related not only to conceptual gaps but also to the pedagogical orientations embedded in teacher education contexts. Many participants appeared to frame SRL primarily in terms of effective task management and strategic learning behaviors, while processes related to post-task reflection and self-evaluation were discussed less explicitly. Within Zimmerman's (2000) framework, self-reaction and reflective evaluation are central mechanisms through which learners interpret their performance and adjust subsequent learning strategies. However, the relative absence of these elements in the participants' descriptions suggests that reflective dimensions of learning may receive less emphasis during their training. In educational systems where academic performance and task completion are strongly prioritized, reflective processes may be implicitly assumed rather than explicitly cultivated. Consequently, pre-service teachers may develop an understanding of SRL that privileges observable strategy use while underrepresenting reflective self-evaluation as a pedagogical focus.

The findings also revealed that participants primarily conceptualized SRL through cognitive and motivational dimensions, emphasizing strategic planning, self-monitoring, and learner motivation. While these components are fundamental to SRL, emotional regulation was largely absent from their explanations. This omission is noteworthy given that contemporary research consistently highlights the role of emotional processes in sustaining learners' engagement, persistence, and adaptive strategy use (Bakhtiar et al., 2018; Boekaerts, 2011; Wolters, 2003).

The absence of references to emotional regulation may reflect broader pedagogical norms in which emotional aspects of learning are not explicitly addressed within instructional practice. In many

formal educational contexts, teachers are trained primarily to manage cognitive progress and classroom performance, whereas emotional processes are often considered secondary or outside the scope of academic instruction. As a result, pre-service teachers may not readily associate emotional regulation with the development of self-regulated learning, even though international research increasingly emphasizes the importance of emotional support and teacher-guided co-regulation in fostering students' self-regulatory capacities (Kostøl & Mänty, 2024; Taxer & Gross, 2018).

These patterns indicate that the participants generally understood SRL as a multidimensional process involving planning, monitoring, and motivational engagement, yet their conceptualizations tended to foreground strategic and behavioral elements over reflective and affective dimensions. Importantly, this pattern should not necessarily be interpreted as a simple lack of knowledge. Rather, it appears to reflect the pedagogical priorities and learning experiences that shape pre-service teachers' professional development. Their interpretations of SRL were strongly influenced by instructional models encountered during their training, which often emphasize classroom management, task completion, and measurable learning outcomes. Consequently, the ways in which pre-service teachers conceptualized SRL directly influenced how they described supporting it in practice.

6.2 Research Question 2

RQ2: Which specific strategies do pre-service EFL teachers employ to support and enhance SRL in the classroom?

The second research question explored the instructional strategies that pre-service EFL teachers reported using to foster self-regulated learning in their classrooms. The strategies described by participants largely corresponded with the aspects of SRL that they emphasized in their conceptual explanations. Teachers frequently mentioned encouraging students to set learning goals, monitor their progress, and remain motivated throughout learning tasks. They also emphasized the importance of providing feedback and creating supportive classroom environments that encourage students to take greater responsibility for their learning processes. These practices were perceived as effective ways of fostering learner autonomy and engagement, particularly within language learning contexts where students must actively manage their own progress and practice opportunities.

Several participants also described using collaborative learning activities as a means of promoting self-regulated learning. Group tasks and peer interactions were viewed as opportunities for students to share strategies, monitor collective progress, and support one another's learning efforts. Such activities can provide meaningful contexts for the development of regulatory skills by allowing learners to observe and negotiate learning strategies within a social environment. However, while collaborative activities were occasionally mentioned, participants rarely discussed the broader concept of socially shared regulation of learning, which emphasizes the collective management of cognitive, motivational, and emotional processes within group learning contexts (Hadwin et al., 2018). This absence suggests that the social dimensions of SRL may not yet be fully integrated into the pedagogical frameworks emphasized in their training.

Another notable finding concerned the limited emphasis placed on explicit strategy instruction. Although pre-service teachers recognized the importance of self-regulated learning skills, their explanations rarely included detailed descriptions of how teachers might systematically teach these strategies to students. This pattern contrasts with existing evidence demonstrating that explicit modeling,

guided practice, and scaffolded instruction are essential for helping learners internalize self-regulatory strategies (Dignath & Büttner, 2008; Schunk & Zimmerman, 1997). Instead, many participants appeared to assume that students would gradually develop regulatory skills through participation in classroom activities and exposure to supportive learning environments. This reliance on implicit learning processes suggests that pre-service teachers may not yet have developed a comprehensive understanding of how SRL strategies can be intentionally modeled, scaffolded, and gradually transferred to learners. Without structured guidance, students may struggle to internalize effective regulatory strategies, particularly in contexts where independent learning practices have not been traditionally emphasized (Perry et al., 2019).

The limited references to emotional support and reflective feedback in participants' responses further illustrate this pattern. While some teachers mentioned providing feedback to support students' evaluation of their work, these comments were relatively infrequent and rarely linked to systematic reflection practices. Similarly, emotional aspects of learning were largely absent from discussions of instructional support, despite research demonstrating that teacher-provided emotional support can significantly influence students' engagement and behavioral regulation (Sankalaite et al., 2021). These findings suggest that pre-service teachers may benefit from more explicit opportunities to explore how emotional and reflective processes can be integrated into everyday classroom practices.

Recent work on teachers' roles in the era of generative AI also helps contextualize the present findings. In a recent study, transforming teachers' roles, agency, and practices in technology-rich environments was shown to depend not only on access to new tools but also on teachers' knowledge, perceptions, and willingness to adopt more learner-centered practices. This is relevant to the current study because supporting self-regulated learning likewise requires teachers to move beyond traditional instruction and actively design opportunities for planning, monitoring, reflection, and strategy use. The study therefore reinforces the idea that teacher preparation should cultivate not only technological readiness (Lim, 2025).

Taken together, the findings highlight an important relationship between teachers' conceptual understanding of self-regulated learning and the instructional strategies they employ to support it. Pre-service teachers tended to implement practices that corresponded with the aspects of SRL they understood most clearly particularly goal setting, monitoring, and motivational encouragement. However, dimensions of SRL that were less prominent in their conceptualizations, such as reflective evaluation, emotional regulation, and explicit strategy instruction, were also less visible in their reported classroom practices. This alignment underscores the importance of addressing conceptual understanding within teacher education programs, as teachers' beliefs about learning processes play a crucial role in shaping their instructional decisions (Pajares, 1992).

From a pedagogical perspective, these findings suggest that teacher education programs could play a more active role in preparing future educators to foster comprehensive self-regulated learning. This preparation may involve integrating explicit instruction on SRL pedagogy into teacher training curricula, including opportunities for pre-service teachers to design lessons that incorporate goal-setting frameworks, reflective learning activities, and structured strategy instruction (Moos & Ringdal, 2020; Zimmerman, 2002). Additionally, teacher education programs may benefit from incorporating training on emotional and motivational support, helping future teachers recognize how emotional regulation and

classroom climate influence students' ability to manage their learning processes (Bakhtiar et al., 2018; Taxer & Gross, 2018).

Furthermore, creating opportunities for collaborative reflection and peer-based learning within teacher education programs could help pre-service teachers better understand the social dimensions of self-regulated learning. Research indicates that experiencing regulatory processes within collaborative and dialogic learning contexts allows teachers to appreciate how shared responsibility and peer interaction contribute to both individual and collective regulation (Hadwin et al., 2018; Järvelä & Hadwin, 2013). Such experiences may ultimately help future teachers design classroom environments that more effectively support the full range of processes involved in self-regulated learning.

Thus, the findings of this study contribute to a deeper understanding of how pre-service EFL teachers conceptualize and attempt to implement self-regulated learning within their instructional practices. While participants demonstrated awareness of several key components of SRL, their responses revealed an emphasis on observable learning strategies and motivational encouragement, with comparatively less attention to reflective and emotional dimensions. These patterns appear to be shaped not only by individual beliefs but also by the broader pedagogical structures within which teacher preparation occurs. Addressing these influences through targeted training, reflective practice, and explicit instruction in SRL pedagogy may help future teachers develop a more comprehensive and balanced approach to fostering self-regulated learning among their students.

7 Conclusion and Implications

This study explored pre-service EFL teachers' interpretations of self-regulated learning (SRL) and the strategies they report using to promote SRL in their classrooms. The findings indicate that although participants demonstrated a general awareness of core SRL concepts particularly goal setting, monitoring, and motivational support their understanding tended to emphasize observable learning behaviors while giving less attention to reflective processes, emotional regulation, and the social dimensions of learning. Similarly, the instructional strategies described by participants largely focused on encouraging motivation and learner responsibility, while explicit strategy instruction, structured reflection, and collaborative regulation were mentioned less frequently.

These findings suggest that pre-service teachers' instructional approaches closely reflect the aspects of SRL they understand most clearly. When key components of SRL such as emotional regulation, reflective evaluation, and socially shared regulation are less prominent in teachers' conceptual frameworks, they are also less likely to appear in their classroom practices. Consequently, strengthening pre-service teachers' theoretical and pedagogical understanding of SRL may be essential for enabling them to implement more comprehensive regulatory support in language learning contexts.

The findings carry several implications for teacher education and language teaching practice. First, teacher education programs may benefit from integrating more explicit instruction on SRL pedagogy within their curricula. This could involve coursework and practicum activities that focus on modeling SRL strategies, guiding students in goal-setting processes, and incorporating structured reflection activities such as learning journals, self-assessment checklists, and post-task evaluation tasks. Such practices can help future teachers understand how regulatory strategies can be systematically introduced and gradually transferred to learners.

Second, teacher preparation programs should place greater emphasis on the emotional and motivational dimensions of learning. Training modules could help pre-service teachers develop skills in providing constructive feedback, fostering supportive classroom climates, and helping learners manage frustration or anxiety during challenging learning tasks. Developing these competencies may enable teachers to support students' persistence and engagement more effectively.

Third, the results highlight the importance of incorporating collaborative learning and shared regulation into teacher education. Providing pre-service teachers with opportunities to experience collaborative planning, peer feedback, and group-based problem solving during their training may help them better understand how social interaction contributes to the development of regulatory skills. In language classrooms, such approaches can translate into group tasks, peer review activities, and collaborative strategy discussions that encourage learners to jointly monitor and regulate their learning processes.

Therefore, a more comprehensive approach to SRL pedagogy one that integrates cognitive, motivational, emotional, and social dimensions may better prepare future language teachers to support students in developing sustainable and autonomous learning strategies.

Despite its contributions, this study had several limitations. First, the findings were based on self-reported data from pre-service teachers, which might not have fully represented their actual classroom practices. Future studies could have incorporated classroom observations or teaching simulations to obtain a more direct understanding of how SRL support was implemented in practice. Second, the relatively limited sample size and specific geographical context might have restricted the generalizability of the results. Replicating the study in different educational settings and cultural contexts could have provided a broader perspective on how pre-service teachers understood and applied SRL principles. Finally, the cross-sectional design of the study did not capture how teachers' understanding and practices evolved over time. Longitudinal research following pre-service teachers throughout their training and early teaching careers could have provided deeper insights into how SRL-related beliefs and instructional strategies developed.

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Authors' Contributions

All authors have conducted the study, collected data, analyzed and interpreted the data, and written up the manuscript.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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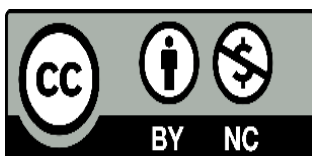
Appendices

Appendix A: Pre-Service Teachers' Interpretation of Self-Regulated Learning

1. How would you define self-regulated learning in your own words?
2. What do you think are the key components or characteristics of self-regulated learning?
3. Can you describe any personal experiences, either as a learner or a teacher, that have shaped your understanding of self-regulated learning?
4. In your opinion, why is self-regulated learning important for pre-service teachers to understand and develop?
5. How do you think self-regulated learning relates to other important concepts in education, such as student engagement, motivation, or metacognition?

Appendix B: Strategies Pre-Service EFL Teachers Use to Support Self-Regulated Learning

1. What strategies do you currently use or plan to use in your future classroom to promote self-regulated learning among your students?
2. Can you provide some examples of how you have implemented or plan to implement these strategies in your classroom?
3. How do you assess or plan to assess the effectiveness of the strategies you use to enhance self-regulated learning in your students?
4. What challenges have you faced or do you anticipate facing when trying to support self-regulated learning in your classroom?
5. How do you address or plan to address these challenges to ensure the successful implementation of self-regulated learning strategies in your classroom?



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