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Exploring the Effect of Flipped Reading Instruction on Reading Performance, Reading Self-Efficacy, and Reading Self-Regulation in EFL Learners: A Mixed Methods Study

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ABSTRACT

This mixed-methods study examined the effects of flipped reading instruction on Iranian EFL learners' reading performance, self-efficacy, and self-regulation. Forty-nine female learners (aged 16–18) from two intact classes were assigned to an experimental group (N = 25) receiving an eight-week flipped intervention and a control group (N = 24) receiving traditional teacher-centered instruction. Reading comprehension, self-regulated learning strategies, and reading self-efficacy were assessed using pre- and post-tests. Semi-structured interviews with 12 experimental participants provided qualitative insights. Quantitative results showed significantly greater gains for the experimental group across all outcomes. Qualitative analysis yielded five themes—enhanced engagement, deeper comprehension, increased autonomy, adaptive learners' proficiency, confidence, and independent learning skills. By simultaneously examining cognitive, affective, and metacognitive outcomes, this study addresses a key gap in the Iranian EFL context and offers theoritical and pedagogical implications.

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Intruduction

Reading comprehension is an intricate cognitive process that stands as the cornerstone of cognitive development and language learning, playing a pivotal role in academic success in higher education (Nasri & Biria, 2017). It involves the dynamic interplay between a reader's prior knowledge and textual information to actively construct meaning (Kintsch & van Dijk, 1978), thereby significantly contributing to EFL learners' self-confidence in engaging with academic discourse (Yee, 2010). However, achieving robust reading proficiency in an EFL context is complex, influenced by manifold factors, including the text's inherent difficulty, individual anxieties, motivation levels, and inadequate linguistic knowledge (Grabe, 1991; Melby-Lervåg & Lervåg, 2014). Traditional teaching methods, often characterized by a teacher-centered paradigm focuing on passive lectures (Chen et al., 2014; Tucker, 2012), have struggled to adequately address these challenges, particularly in developing the higher-order thinking skills required for deep comprehension.

In response, a significant pedagogical shift has occurred with the rise of the flipped classroom (Tucker, 2012). This model fundamentally reconfigures the process by moving direct instruction (Bishop & Verleger, 2013) to independent, pre-class engagement, thus freeing up valuable in-class time for active learning, collaborative problem-solving, and individualized teacher support (Bergmann & Sams, 2012; Davies et al., 2013). The flipped approach is inherently student-centered and is robustly supported by educational theories such as Constructivism (Vygotsky, 1978), Cognitive Load Theory (Sweller, 1988, 1994), and Self-Determination Theory (Deci & Ryan, 1985), which highlights the role of autonomy, competence, and relatedness in fostering intrinsic motivation (Chuang et al., 2018; Lai & Hwang, 2016). In L2 education, flipped instruction has demonstrated considerable promise in enhancing speaking, writing, and overall achievement (Shahnama et al., 2021; Turan & Akdag-Cimen, 2020; Vitta & Al-Hoorie, 2023), by enabling deeper textual analysis and strategic application in class (Samiei & Ebadi, 2021).

Despite the critical role of foreign language reading in academic success and persistent comprehension struggles among Iranian EFL students (Hashemifardnia et al., 2018), comprehensive empirical investigation into the specific effects of flipped instruction on EFL reading within the Iranian context remains notably scarce and fragmented (Fisher et al., 2024; Lee & Wallace, 2018). Crucially, a significant void exists regarding the holistic impact of the flipped model on the intertwined factors of reading performance, reading self-efficacy (Bandura, 1997), and reading self-regulation (Zimmerman, 2000) simultaneously.

This research addresses this critical gap by rigorously exploring the influence of flipped reading instruction on the integrated dimensions of EFL learning in Iran. The findings will provide crucial empirical support for a more integrated theoretical model (Doo & Bonk, 2020; Lai & Hwang, 2016) and offer actionable insights for educators, curriculum developers, and policymakers.

The overall purpose of this study is to comprehensively investigate the impact of transitioning from traditional to flipped reading instruction on EFL learners' reading performance, reading self-efficacy, and

reading self-regulation, while also exploring students' qualitative perceptions to reveal the underlying mechanisms of change. Accordingly, this study is guided by the following research questions and corresponding null hypotheses:

1. To what extent does flipped reading instruction have any significant effect on the reading performance of Iranian EFL students?
2. To what extent does flipped reading instruction have any significant effect on the reading self-efficacy of Iranian EFL students?
3. To what extent does flipped reading instruction have any significant effect on the reading self-regulation of Iranian EFL students?
4. What perceptions do Iranian EFL students hold regarding their experience with flipped reading instruction?

A brief note of previous works

Theoretical Foundations of Flipped classroom in L2 Reading Comprehension

The flipped classroom represents a seminal pedagogical innovation of the twenty-first century, fundamentally inverting the conventional instructional approach (Bergmann & Sams, 2012; Bishop & Verleger, 2013). At its core, the model shifts direct instruction—traditionally delivered via lectures—outside the classroom for independent, pre-class content acquisition, thereby dedicating valuable in-class time to active learning, collaborative application, and individualized support (Bishop & Verleger, 2013; Davies et al., 2013; Ferreri & O'Connor, 2013). This structural reorientation, consequently, necessitates a philosophical pivot from a teacher-centric to a genuinely student-centered paradigm (Ozdamli & Asiksoy, 2016; Tucker, 2012).

The widespread adoption and demonstrated effectiveness of the flipped model are, in turn, robustly supported by several cornerstone educational theories. First, the model inherently facilitates active knowledge construction based on the principles of Constructivism and Social Constructivism (Bruner, 1966; Vygotsky, 1978). The pre-class phase permits students to self-pace the initial engagement with foundational content, initiating meaning-making and the formation of new schemata (Lo, 2018; Nassaji, 2002; Rumelhart, 1980). This groundwork enables the in-class phase to serve as a critical arena for social interaction and collaboration, allowing learners to consolidate, refine, and apply knowledge and benefit from peer scaffolding within the Zone of Proximal Development (Fulton, 2012; Lo & Hew, 2017; McCallum et al., 2015; Vygotsky, 1978). Second, the flipped structure strategically optimizes learning by managing the limitations of working memory, aligning with Cognitive Load Theory (CLT) (Sweller, 1988, 1994). Specifically, by moving the initial exposure to complex material (high intrinsic load) outside the time-pressured lecture setting, students can self-pace their learning (e.g., replaying videos), thus minimizing extraneous load (Bishop & Verleger, 2013; Lai & Hwang, 2016). This crucial step preserves working memory capacity for the in-class activities, which are specifically designed to foster germane load (schema construction and higher-order application) (Lo, 2018; Sweller et al., 1998). Third, the model intrinsically supports the three core psychological needs—autonomy, competence, and relatedness—

central to fostering intrinsic motivation, as theorized by Self-Determination Theory (SDT) (Deci & Ryan, 1985, 2000). Autonomy is promoted via control over the pace and place of pre-class learning (Bergmann & Sams, 2012; Lai & Hwang, 2016; Tucker, 2012), while competence is enhanced through successful mastery and immediate feedback during in-class application (Awidi & Paynter, 2019; Rahmani et al., 2025), and relatedness is cultivated through robust peer and teacher interaction (Chuang et al., 2018; McCallum et al., 2015).

Turning to empirical evidence, the literature in L2/FL contexts consistently supports the flipped model's utility and broad benefits. Flipped learning reliably boosts student engagement and motivation (Awidi & Paynter, 2019; Chen Hsieh et al., 2017; Santhanasamy & Yunus, 2022; Mahmoudabadi, 2024; Mahmoudabadi, 2024; Moradi & Dowlatabadi, 2021; Razavi, S. N. & Salehi, H. 2023) fosters greater learner autonomy, and aids the development of self-regulated learning (SRL) (Lai & Hwang, 2016; Eassavi & Nematti, 2025; Santhanasamy & Yunus, 2022). Furthermore, it enhances student self-efficacy, a core belief crucial for persistence in language learning (Chuang et al., 2018; Fan, 2022; Liu et al., 2022). In fact, meta-analyses affirm this strong positive influence on overall L2/FL achievement, consistently reporting large effect sizes (Cohen's $d = 0.99$, Hedges' $g = 0.99$) when compared to traditional methods (Vitta & Al-Hoorie, 2023). More specifically, research demonstrates the model's efficacy across various language skills: Speaking and Writing benefit significantly as in-class time is dedicated to communicative practice (e.g., debates, role-plays) and collaborative production (e.g., peer editing, personalized feedback), which are vital for fluency, accuracy, and strategic development (Arslan, 2020; Chen Hsieh et al., 2017; Fathi & Rahimi, 2022; Liu et al., 2022; Santhanasamy & Yunus, 2022; Turan & Akdag-Cimen, 2020). Crucially, L2 Reading Comprehension is increasingly studied, with findings showing that flipped reading instruction leads to significant achievement gains (Abaeian & Samadi, 2016; Bataineh & Al-Sakal, 2021; Fathi & Barkhoda, 2021; Mohammaddokht & Fathi, 2022), concurrently promoting higher-order skills such as inferential reading (Samiei & Ebadi, 2021).

However, despite its strong potential, the flipped model's implementation in L2 education is not without considerable challenges. One significant hurdle is student resistance and preparedness: learners, especially those accustomed to conventional instruction, may initially resist the increased responsibility and self-discipline required for pre-class learning (Bergman, 2015; Clark, 2015; Lai & Hwang, 2016; Lo & Hew, 2017; Turan & Akdag-Cimen, 2020). Failure to adequately engage with asynchronous materials fundamentally undermines the core efficacy of in-class activities (Huang et al., 2025). This is often compounded by technological and contextual barriers: unequal access to reliable internet, appropriate devices, and digital literacy creates a "digital divide," potentially exacerbating existing educational inequalities (Arslan, 2020; Bollitore, 2013; Lo & Hew, 2017). Moreover, instructor adaptation and workload represent a third challenge, as designing high-quality asynchronous materials and mastering the role of a facilitator rather than a lecturer requires significant time, effort, and pedagogical retraining (Arslan, 2020; Bergman, 2015; Fulton, 2012; Lo & Hew, 2017; Snyder et al., 2014). Addressing these

persistent issues requires ongoing research focused on refining design principles and scaffolding methods (Jiang et al., 2022; Limniou et al., 2018).

The Flipped Classroom Model and its Impact in EFl

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Effective and Metacognitive Factors in Flipped Learning

The efficacy of the flipped classroom extends beyond merely restructuring instructional time to profoundly influence the affective and metacognitive variables that are critical for successful long-term learning (Chuang et al., 2018; Lai & Hwang, 2016). Specifically, the model systematically nurtures self-efficacy (SE) and self-regulated learning (SRL), two interconnected constructs that determine learner engagement, persistence, and achievement (Schunk & Zimmerman, 1997).

Self-efficacy, a pivotal construct within Bandura's (1977, 1986, 1997) Social Cognitive Theory (SCT), refers to an individual's dynamic belief in their capacity to organize and execute the actions necessary to achieve prospective situations (Bandura, 1997). High SE, in turn, is a robust predictor of

motivation, persistence in the face of obstacles, and superior academic performance in L2/FL contexts (Pajares, 1996; Raoofi et al., 2012; Wang & Sun, 2020). The flipped model's design intrinsically targets Bandura's (1997) four primary sources of SE development: The most powerful source, Mastery Experiences (Enactive Attainments), is fostered through the independent, self-paced nature of the pre-class phase, which permits learners to review content (e.g., videos, readings) and practice exercises until comprehension is successfully achieved (Bishop & Verleger, 2013; Lai & Hwang, 2016). This control maximizes opportunities for successful "micro-masteries" in a low-stakes environment, directly bolstering confidence before application in the live classroom (Bi et al., 2023; Han & Hamzah, 2024; Hsiao et al., 2023). Vicarious Experiences are promoted through collaborative in-class activities, where learners observe peers successfully tackling complex tasks, instilling a powerful conviction that they too can achieve similar results, a process key to EFL contexts (Abdullah et al., 2020; Hao & Fang, 2024; Jiang et al., 2022; Schunk & Zimmerman, 1997). Moreover, the model frees up instructional time for Verbal Persuasion, allowing the instructor to offer personalized attention, targeted encouragement, and specific, timely feedback during in-class application (Bi et al., 2023; Lo & Hew, 2017). This tailored support affirms students' effort and strategy use, acting as credible verbal persuasion (Hao & Fang, 2024; Namaziandost & Çakmak, 2020). Finally, the flipped approach positively impacts Physiological and Affective States by allowing learners to manage their initial exposure at their own optimal pace, which lowers pressure and anxiety associated with complex L2 material (Mohammaddokht & Fathi, 2022). This reduced anxiety and greater sense of autonomy fosters positive emotional experiences, thereby enhancing SE (Fan, 2022; Han & Hamzah, 2024). Empirical evidence consistently supports this powerful connection: meta-analyses confirm that the flipped classroom significantly improves SE across educational settings (Sun et al., 2023), and specific EFL studies, including those conducted in Iran, show marked increases in learner self-efficacy and its contributing factors (Bi et al., 2023; Fathi & Barkhoda, 2021).

In a complementary fashion, the flipped model systematically cultivates Self-Regulated Learning (SRL), a proactive, adaptive process through which learners personally manage their thoughts, behaviors, and emotions to strategically achieve academic goals (Zimmerman, 1989, 2000, 2002). SRL, which encompasses a complex interplay of metacognitive, motivational, and behavioral components (Pintrich, 2000; Schunk & Zimmerman, 2012), is indispensable for language learners managing complex practice (Dörnyei, 2001; Oxford, 2016). Critically, SRL and self-efficacy share a reciprocal relationship (Bai & Wang, 2023; Schunk & Zimmerman, 1997), where high SE motivates strategy use, and successful strategy implementation reinforces SE (Kim et al., 2015; Schunk, 2012). The flipped classroom is inherently structured to facilitate SRL's cyclical phases (Zimmerman, 2000, 2002): in the *forethought* (planning) phase, the asynchronous environment explicitly prompts learners to independently plan time, set content mastery goals, and select processing strategies (Cengiz & Ataş, 2025; Lai & Hwang, 2016). During the *performance control* phase, the flexibility of replaying videos provides ideal conditions for continuous self-monitoring and self-correction (Zimmerman, 2000), while the shift to higher-order tasks

in class compels immediate application and adjustment of strategies (Öztürk & Çakıroğlu, 2021). Finally, the *self-reflection* phase is supported by in-class collaborative tasks and peer feedback, which serve as a dynamic arena for the evaluation of strategy effectiveness (Park & Kim, 2022; Samaila et al., 2024). Furthermore, the collaborative nature of flipped learning fosters co-regulation, where peers monitor and support each other's learning, providing external scaffolding that aids the internalization of individual SRL (Cengiz & Ataş, 2025; Hadwin & Oshige, 2011). This systematic encouragement is broadly supported by empirical findings showing that flipped instruction enhances writing self-regulation (Fathi et al., 2021), fosters greater learner autonomy (Hosseini et al., 2020), and improves SRL strategy use in reading (Wang, 2023). Models that incorporate explicit SRL guidance show even greater promise in promoting these skills (Öztürk & Çakıroğlu, 2021; Rezaeyan et al., 2025).

Despite this compelling evidence, which confirms the flipped classroom as a potent pedagogical framework for simultaneously fostering self-efficacy and self-regulation, a critical research gap persists. While some studies examine the link between flipped learning and SE or SRL in isolation (Bi et al., 2023; Fathi & Barkhoda, 2021; Lai & Hwang, 2016), few comprehensively investigate how flipped reading instruction specifically impacts the critical nexus of reading performance, reading self-efficacy, and reading self-regulation within a single, integrated mixed-methods design (Fisher et al., 2024). This integrated examination is essential for understanding the holistic influence of the model on the cognitive, affective, and metacognitive dimensions of L2 reading, particularly within the under-researched Iranian EFL context.

Method

A total of 49 Iranian EFL learners were recruited from two private language schools in Javanroud ,small city in west of Iran, to participate in this quasi-experimental study. All participants were female, aged between 16 and 18, and enrolled in Pre-IELTS courses, indicating an intermediate-level (B1) language proficiency. The two pre-existing intact classes were randomly assigned via a coin flip to the experimental group ($N = 25$) and the control group ($N = 24$). This use of random allocation of intact classes minimized initial systematic bias, despite the infeasibility of random assignment of individual participants.

Homogeneity of language proficiency was confirmed at the outset using the Oxford Placement Test (OPT; Allan, 2004). An independent samples *t*-test revealed no statistically significant difference between the experimental group ($M = 48.32$, $SD = 4.15$) and the control group ($M = 47.95$, $SD = 4.30$), $t\ (47) = 0.32$, $p = .75$, with mean scores aligning with the B1 proficiency band. Participants shared comparable demographic and educational backgrounds, having 3 to 5 years of prior English instruction, primarily supplemented by private tutoring. Crucially, none of the participants had significant prior experience with flipped classroom methodologies.

The experimental group received the online flipped reading instruction model, accessing pre-class materials (video lectures and reading materials) via a dedicated online platform, with in-class time reserved for collaborative tasks and teacher-facilitated discussions. Conversely, the control group received traditional teacher-centered instruction, completing identical reading tasks in the classroom

without any online pre-class engagement. The instructional time was equivalent for both groups, ensuring comparability except for the mode of instruction.

Ethical considerations were rigorously maintained throughout the study. Written informed consent was secured from both the participants and their legal guardians. Participants were assured of their right to withdraw at any stage, and anonymity and confidentiality were strictly preserved, with all data securely stored and utilized solely for academic purposes. This careful control ensures that the assessed impact on the dependent variables—L2 reading comprehension, reading self-efficacy, and reading self-regulation—can be accurately attributed to the intervention.

Instruments

Reading Comprehension

The participants' reading comprehension abilities were measured using the IELTS Academic Reading Test (University of Cambridge ESOL Examinations, 2011). This standardized assessment comprises three sections, each featuring an academic passage of progressively increasing difficulty, followed by multiple-choice questions designed to assess comprehension and analytical skills. The test includes 40 questions and is administered within a 60-minute time frame. Renowned for its reliability and validity, the IELTS Academic Reading Test has been extensively used in L2 research to evaluate reading proficiency in academic contexts.

Self-Regulated Learning Strategy Use Questionnaire

The Self-Regulated Learning (SRL) questionnaire, originally developed by Tse et al. (2022), was administered in English. This decision was based on the pilot study's findings, which through post-administration comprehension checks and participant debriefing, indicated that the participants possessed sufficient English proficiency to understand and respond to the questionnaire items without difficulty. This 13-item questionnaire evaluates the employment of SRL strategies across three phases: planning, monitoring, and evaluating. Planning strategies involve setting goals and previewing texts, monitoring focuses on tracking comprehension and progress, and evaluating pertains to assessing learning outcomes and the efficacy of strategies employed. Responses were collected on a 4-point Likert scale ranging from 1 (ever or almost never) to 4 (very day or almost every day). In this study, the SRL strategy use questionnaire exhibited high internal consistency, with a Cronbach's alpha of 0.86 for the pre-test and 0.87 for the post-test, ensuring its suitability for research purposes.

Reading Self-Efficacy Questionnaire (RSEQ)

The Reading Self-Efficacy Questionnaire (RSEQ), adapted from Ghezlou, Kordi, and Nasri (2014), was also administered in English, as supported by the pilot study's findings via participant debriefing. This questionnaire incorporates elements from established instruments, including Li and Wang's (2010) Reading Self-Efficacy Questionnaire, Ghonsooly and Elahi's (2010) EFL Learners' Self-Efficacy in Reading Comprehension, and Horwitz's (1988) Beliefs about Language Learning (BALL) Reading Strategies Questionnaire. The RSEQ comprises 16 items rated on a 5-point Likert scale, ranging from 1

("strongly disagree") to 5 ("strongly agree"). The reliability of the instrument was confirmed with a Cronbach's alpha coefficient of 0.83 for the pre-test and 0.85 for the post-test in the present study.

Semi-Structured Interviews

To gain insights into the attitudes of the experimental group towards the flipped reading instruction, semi-structured interviews were conducted. The interviews aimed to explore participants' experiences, perceived benefits, and challenges associated with the online flipped instruction model. Sample interview questions included:

- "How did you feel about the pre-class activities in the flipped reading instruction?"
- "What differences, if any, did you notice in your reading comprehension compared to traditional methods?"
- "How did the flipped instruction influence your motivation and confidence in reading?"
- "What aspects of the flipped model did you find most effective or challenging?"

The interviews were conducted in a language the participants felt most comfortable with. Participants were free to respond in English, Kurdish (their native language), or Persian (the official language of the country). This flexibility aimed to facilitate the most open and expressive communication possible. The interviews were audio-recorded and transcribed. Where necessary, translations were undertaken by a bilingual researcher fluent in both English and the language of the interview. A second researcher, also bilingual, then independently reviewed the transcripts and translations to ensure accuracy and consistency. Any discrepancies were resolved through discussion and consensus.

Online Flipped Instruction Application

The flipped reading instruction was facilitated through the use of Google Classroom, a widely recognized online learning platform. Google Classroom provided a centralized hub where participants could access pre-class materials, including video lectures, reading guides, and supplementary exercises. The platform allowed for seamless distribution of assignments and enabled students to interact with content asynchronously. Features such as embedded video links, downloadable PDFs, and discussion threads supported collaborative and individualized learning. The use of Google Classroom ensured accessibility and user-friendliness, enabling participants to engage with flipped instruction without requiring advanced technical skills. Regular technical support was offered to address any challenges encountered during the study.

Procedure

This study utilized a quasi-experimental design with pre- and post-tests to examine the impact of instructional mode on reading performance, reading self-efficacy, and reading self-regulation. Participants were assigned to one of two groups: an experimental group (N = 25) or a control group (N = 24). Both groups participated in two 90-minute reading instruction sessions per week over an eight-week intervention period. The groups were exposed to identical instructional time, materials, and tasks, with the only distinction being the mode of delivery, as outlined in Table 3.1 and further detailed in Appendix A.

Experimental Group

The experimental group participated in an eight-week flipped learning program (*2 × 90-minute sessions per week*) that integrated online pre-class preparation with interactive in-class work. Google Classroom functioned as the central platform for distributing materials, communicating with learners, and collecting assignments, allowing the instructional cycle to operate consistently across the intervention. Pre-class engagement, which typically required about 45 minutes, was intended to establish the conceptual foundation necessary for productive classroom collaboration. Students first viewed short instructional videos (6–10 minutes), either created by the instructor or sourced from reputable educational platforms such as Khan Academy or TED-Ed, that introduced key reading strategies—including skimming and note-taking—at a level appropriate for B1 learners. They then read IELTS Academic Reading–level texts on topics such as environmental issues and cultural diversity; all texts were screened through the Flesch–Kincaid readability test (Grade Level 7–9, Reading Ease > 60) to ensure suitability. To consolidate understanding, students completed online comprehension tasks, including multiple-choice, true/false/not-given, and short-answer items, which required them to locate evidence, summarize information, and make predictions. These activities ensured that learners arrived in class with essential knowledge already in place.

The 90-minute in-class sessions built directly on this preparation and were devoted to collaborative and interactive learning. Students worked in small groups of four to five to analyze the assigned texts, identify main arguments, and discuss alternative interpretations, with roles such as discussion leader or note-taker rotated regularly to distribute responsibility and skill development. Pair-work activities, including text summarization and the creation of comprehension questions, further supported strategy use; structured guidelines and checklists were used to maintain the quality of peer interaction. Throughout these sessions, the instructor facilitated discussion through questioning, modeling of thinking processes, and targeted feedback, both verbal and written (via Google Classroom), emphasizing the application of strategies and pointing out areas for refinement. Learners were expected to incorporate this feedback into ongoing work.

A typical cycle therefore involved engaging with pre-class content—such as viewing a video on argumentative structures or completing short comprehension tasks—followed by in-class application through group debates, collaborative construction of summaries based on textual evidence, and focused peer discussion. Online engagement and task completion were monitored through Google Classroom analytics, ensuring accountability and consistent participation.

Control Group

The control group adhered to a conventional teacher-centered instructional approach, closely matching the experimental group in terms of instructional time, reading materials, and task types, but excluding any online pre-class engagement.

Each 90-minute session commenced with the instructor providing an overview of the reading passage, including explicit explanation of key vocabulary (using definitions and contextual examples) and a

demonstration of reading strategies (e.g., skimming and scanning). Following this introduction, the instructor led a guided reading activity, where the class read the passage aloud. The instructor periodically paused the reading to discuss sentence structure, vocabulary, and comprehension, encouraging active participation through think-alouds, collaborative interpretation, and responses to guiding questions.

After the collective activity, students transitioned to independent practice, completing comprehension tasks identical to those assigned to the experimental group (e.g., multiple-choice questions, short-answer questions), but performed during class time. To match the cognitive demands of the experimental group's asynchronous work, the control group was assigned comparable homework tasks (e.g., worksheets for review and comprehension exercises) based on the same reading passages, all provided in printed format. A sample learning cycle involved a guided reading activity on environmental sustainability, followed by individual in-class comprehension tasks and a whole-class discussion for consolidation. Homework reinforced the in-class content through a set of practice questions.

To guarantee instructional equivalence, both groups engaged in a total of three hours of instruction per week (in-class and out-of-class activities) using identical reading passages and comprehension tasks. Feedback mechanisms were also standardized for consistency: while the experimental group received written online feedback, the control group received verbal feedback during in-class sessions. In both cases, feedback was specific, actionable, and provided within 24 hours of task completion, ensuring comparable levels of instructional rigor and support for students' application of reading strategies.

The Pilot Study

A pilot study was conducted prior to the main investigation to refine the research design and evaluate the appropriateness of the instruments. Ten EFL learners who closely matched the characteristics of the main sample (female, aged 16–18, enrolled in Pre-IELTS courses) participated in a condensed two-week version of the flipped reading instruction model. The pilot served several purposes. It first enabled the research team to examine the clarity and effectiveness of the instructional videos and online materials; participant feedback resulted in minor revisions to instructional wording and the use of more engaging visuals. It also facilitated adjustments to the length and difficulty of reading passages and comprehension tasks, as some texts were shortened and certain items rephrased to improve clarity. Administering the SRL and RSEQ questionnaires in English confirmed that learners possessed sufficient proficiency to understand and respond to the items, a conclusion supported by post-administration comprehension checks and debriefing interviews. Finally, the pilot offered practical insight into the feasibility of implementing the flipped model within the learners' schedules and technological constraints, leading to minor modifications such as adjusting the timing of pre-class tasks and ensuring adequate technical support.

Data Analysis

Data analysis followed a mixed-methods design to provide a comprehensive account of the intervention's effects on reading comprehension, reading self-efficacy, and reading self-regulation. Quantitative analyses were conducted in SPSS (Version 27). Pre- and post-test scores were first examined for

normality using the Shapiro–Wilk test, after which descriptive statistics (means and standard deviations) were calculated. The impact of instruction was then evaluated using paired samples *t*-tests to compare within-group gains and ANCOVA to assess post-test differences between the experimental and control groups while controlling for baseline scores (Field, 2018). Effect sizes (*Cohen's d*) were computed to determine the magnitude of change, adopting the conventional thresholds of 0.2, 0.5, and 0.8 for small, medium, and large effects, respectively (Cohen, 1988). All analyses were carried out with close attention to statistical assumptions, including normality and homogeneity of variances for ANCOVA.

Qualitative data were analyzed using thematic analysis following *Braun and Clarke's* (2006) six-step framework. The process involved repeated readings of the interview transcripts, generation of initial codes, and the development of broader themes that captured learners' perceptions of the flipped instruction, including its benefits and challenges. Credibility was strengthened through investigator triangulation, whereby a second researcher independently coded a subset of transcripts and discrepancies were resolved through discussion (Lincoln & Guba, 1985). Member checking was also conducted, with several participants reviewing the thematic summaries to ensure accuracy and alignment with their experiences.

To integrate the quantitative and qualitative strands, a joint display matrix was developed, allowing for side-by-side comparison of statistical outcomes (e.g., improved performance in the experimental group) and qualitative reflections (e.g., enhanced engagement). This integrative analysis provided a more comprehensive interpretation of the findings, offering a nuanced understanding of how the intervention influenced learners' cognitive, affective, and behavioral development.

Results

Quantitative Results

Prior to the main analyses, all statistical assumptions were examined. Normality was evaluated using the Shapiro–Wilk test for reading comprehension, self-regulated learning strategies, and reading self-efficacy across pre- and post-test scores. No significant deviations were detected ($p > .05$), supporting the use of parametric tests such as paired samples *t*-tests and ANCOVA. Levene's tests indicated homogeneity of variances at both testing points ($p > .05$). The homogeneity of regression slopes assumption for ANCOVA was also met, as the interaction between the covariate (pre-test scores) and group (experimental vs. control) was non-significant for all dependent variables. These results indicate that the relationship between each covariate and outcome variable was comparable across groups.

Independence of observations was assumed given the random assignment of intact classes and individual completion of assessments. No clustering patterns were observed that would necessitate multilevel modeling. Visual inspection of scatterplots and Q–Q plots confirmed linearity and the absence of influential outliers, with minor deviations exerting no undue effect on the analyses.

Reading Comprehension

Reading comprehension was assessed using the 40-item IELTS Academic Reading Test. As shown in Table 1, the experimental group demonstrated a substantial increase from the pre-test (24.20, SD = 3.75) to the post-test (34.80, SD = 3.30). The control group also improved, though to a lesser extent, increasing from 23.80 (SD = 4.10) to 27.50 (SD = 3.95). These descriptive results suggest a stronger effect of flipped instruction relative to traditional teaching.

Table 1. ***Descriptive Statistics for Reading Comprehension Scores***

Group	Test	Mean (M)	Standard Deviation (SD)
Experimental	Pre-Test	24.20	3.75
Experimental	Post-Test	34.80	3.30
Control	Pre-Test	23.80	4.10
Control	Post-Test	27.50	3.95

Paired samples *t*-tests (Table 2) confirmed significant gains in both groups. The experimental group showed a mean improvement of 10.60 (SD = 2.15), $t(24) = 15.72$, $p < .001$, $d = 1.22$. The control group's improvement of 3.70 (SD = 1.85) was also significant, $t(23) = 6.85$, $p < .001$, $d = 0.81$, though markedly smaller.

Table 2. ***Paired Samples t-Test for Reading Comprehension Scores***

Group	Test	Mean Difference	SD	T	Df	p	Cohen's d
Experimental	Pre-test - Post-test	10.60	2.15	15.72	24	<.001	1.22
Control	Pre-test - Post-test	3.70	1.85	6.85	23	<.001	0.81

To compare post-test performance while accounting for initial differences, an ANCOVA was conducted using pre-test scores as a covariate (Table 3). There was a significant group effect, $F(1, 46) = 54.89$, $p < .001$, partial $\eta^2 = .28$, indicating that flipped instruction explained a considerable proportion of variance in post-test performance. Adjusted means showed the experimental group outperforming the control group (34.75 vs. 27.55), reinforcing the positive impact of the flipped model on reading comprehension.

Table 3. ***ANCOVA for Reading Comprehension Post-Test Scores***

Source	df	F	P	Partial η^2	Adjusted Means (Experimental)	Adjusted Means (Control)
Pre-test	1	120.32	<.001	.72		
Group	1	54.89	<.001	.28	34.75	27.55
Error	46					

Self-Regulated Learning Strategies

Self-regulated learning (SRL) was assessed using a 52-point questionnaire. As shown in Table 4, the experimental group's mean score increased from 29.20 (SD = 5.80) to 43.60 (SD = 4.50), whereas the control group showed a smaller gain from 28.80 (SD = 5.90) to 33.90 (SD = 5.20). These descriptive results indicate a stronger effect of flipped instruction on SRL strategy use.

Table 4. ***Descriptive Statistics for Self-Regulated Learning Strategies***

Group	Test	Mean (M)	Standard Deviation (SD)
Experimental	Pre-Test	29.20	5.80
Experimental	Post-Test	43.60	4.50
Control	Pre-Test	28.80	5.90
Control	Post-Test	33.90	5.20

Paired samples *t*-tests (Table 5) confirmed significant improvements in both groups. The experimental group showed a mean increase of 14.40 (SD = 3.10), $t(24) = 15.34$, $p < .001$, $d = 1.25$. The control group improved by 5.10 (SD = 2.50), $t(23) = 5.87$, $p < .001$, $d = 0.69$. Although both groups benefited, the magnitude of change was notably larger for the experimental group.

Table 5. ***Paired Samples t-Test for Self-Regulated Learning Strategies Scores***

Group	Test	Mean Difference	SD	T	Df	p	Cohen's d
Experimental	Pre-test - Post-test	14.40	3.10	15.34	24	<.001	1.25
Control	Pre-test - Post-test	5.10	2.50	5.87	23	<.001	0.69

To compare post-test SRL scores while controlling for baseline differences, an ANCOVA was conducted with pre-test scores as the covariate (Table 6). The group effect was significant, $F(1, 46) = 38.72$, $p < .001$, partial $\eta^2 = .22$, indicating that flipped instruction accounted for a substantial portion of variance in SRL outcomes. Adjusted post-test means further supported this pattern, with the experimental group scoring higher than the control group (43.45 vs. 34.05).

Table 6. *ANCOVA for Self-Regulated Learning Strategies Post-Test Scores*

Source	df	F	P	Partial η^2	Adjusted Means (Experimental)	Adjusted Means (Control)
Pre-test	1	90.54	<.001	.66		
Group	1	38.72	<.001	.46	43.45	34.05
Error	46					

Reading Self-Efficacy

Reading self-efficacy was assessed using the RSEQ (maximum score = 80). As shown in Table 7, both groups improved from pre- to post-test, with the experimental group showing a notably larger gain. Their mean increased from 45.20 (SD = 7.10) to 65.40 (SD = 6.20), whereas the control group increased from 44.80 (SD = 7.50) to 51.30 (SD = 6.90).

Table 7. ***Descriptive Statistics for Reading Self-Efficacy Scores***

Group	Test	Mean (M)	Standard Deviation (SD)
Experimental	Pre-Test	45.20	7.10
Experimental	Post-Test	65.40	6.20

Control	Pre-Test	44.80	7.50
Control	Post-Test	51.30	6.90

Paired samples *t*-tests (Table 8) confirmed significant improvements in both groups. The experimental group showed a mean increase of 20.20 (SD = 4.50), $t(24) = 13.67$, $p < .001$, $d = 1.10$. The control group improved by 6.50 (SD = 3.10), $t(23) = 6.01$, $p < .001$, $d = 0.61$. Although both instructional approaches were effective, the experimental group demonstrated substantially larger gains.

Table 8. ***Paired Samples t-Test for Reading Self-Efficacy Scores***

Group	Test	Mean Difference	SD	T	df	p	Cohen's d
Experimental	Pre-test - Post-test	20.20	4.50	13.67	24	<.001	1.10
Control	Pre-test - Post-test	6.50	3.10	6.01	23	<.001	0.61

To compare post-test self-efficacy scores while controlling for baseline levels, an ANCOVA was conducted (Table 9). The group effect was significant, $F(1, 46) = 45.31$, $p < .001$, partial $\eta^2 = .25$, indicating that approximately 25% of the variance in post-test scores was attributable to instructional condition. Adjusted post-test means further reflected this pattern (experimental = 65.25; control = 51.45).

Table 9. *ANCOVA for Reading Self-Efficacy Post-Test Scores*

Source	df	F	P	Partial η^2	Adjusted Means (Experimental)	Adjusted Means (Control)
Pre-test	1	102.65	<.001	.69		
Group	1	45.31	<.001	.25	65.25	51.45
Error	46					

Overall, the results show that flipped instruction produced greater improvements in reading self-efficacy than traditional instruction. Together with findings for reading comprehension and SRL, these outcomes indicate that the flipped model fostered stronger academic gains across all measured domains.

Qualitative Results

To gain deeper insights into the experiences and perceptions of EFL learners in the experimental group, semi-structured interviews were conducted with 12 participants. These individuals were purposively selected to represent a range of performance levels (*four high-achievers, four average-achievers, and four low-achievers*) based on pre-test reading comprehension scores. Thematic analysis was employed on the transcripts, following Braun and Clarke's (2006) six-step framework, to identify and interpret recurring patterns related to students' experiences with the flipped model, including "preference for videos," "collaborative learning benefits," and "increased confidence." This iterative process resulted in the identification of five overarching themes that encapsulate the model's impact:

Flipped Learning as a Catalyst for Enhanced Engagement and Motivation

A prominent finding was the model's significant boost to students' engagement and intrinsic motivation. Participants frequently highlighted how pre-class instructional videos, with their short, clear content, animations, and practical, real-life examples, made learning more enjoyable and relevant (P10, P12). This heightened engagement directly translated into active preparation, as students were spurred by the anticipation of in-class discussions (P8). Interactive online quizzes, which provided immediate feedback, emerged as a powerful motivator for deep text understanding and correction (P4). Collectively, these reflections indicate that the flipped model successfully created a captivating and proactive learning environment.

Facilitating Deeper Reading Comprehension Through Active Learning

Participants consistently described the flipped model as instrumental in achieving a more profound understanding of the reading materials. They deeply valued the ability to revisit pre-class content at their own pace—for instance, replaying videos until a concept "made sense"—which was crucial for solidifying comprehension (P3). In-class collaborative activities further enriched understanding, offering a dynamic platform for clarifying doubts and exploring diverse interpretations. Participants described discussions as transformative, emphasizing how hearing peers interpret the text "made me think differently" (P21). Moreover, the use of structured group roles (e.g., note-taker) actively compelled deeper processing, as one participant noted they "had to summarize everyone's points," fostering a more analytical approach (P11).

Cultivating Learner Autonomy and Self-Direction

The flipped model fostered a greater sense of autonomy and cultivated essential self-management skills, including time management and self-discipline. Students appreciated the inherent flexibility to decide when to complete pre-class activities, allowing them to better plan their schedules (P15). However, this increased autonomy initially required a challenging period of adjustment, demanding self-discipline (P5). Despite initial hurdles, many participants successfully improved their organizational skills, using personal checklists and breaking tasks into smaller parts, demonstrating a transition to greater ownership of their learning journey (P1).

Navigating Challenges and Demonstrating Adaptability

Participants openly shared challenges, primarily related to initial time management and technological issues. The transition felt overwhelming at first, requiring students to intentionally set aside specific study times (P9). Technical barriers, such as unreliable internet connectivity, led to frustration (P18); however, the majority reported successfully adapting by proactively finding workarounds, such as breaking tasks into smaller parts (P23) or using peer support and messaging classmates to "catch up" on materials (P7). These narratives highlight the participants' commendable resilience and resourcefulness in adjusting to the flipped format.

Cultivating Metacognitive Awareness and Strategic Reading Behavior

A fifth, crucial theme was the profound development of a more conscious understanding of their own reading processes and strategic decision-making. Participants reported becoming acutely aware of how, when, and why they employed specific reading strategies, demonstrating increased metacognitive awareness. One learner keenly observed their strategic evolution, realizing "which strategies I used most often, like skimming first" (P19), while another explained a process of active experimentation and refinement of different note-taking or summarizing approaches to determine "what worked best for me" (P6). This significantly increased metacognitive awareness transformed participants into more strategic and adaptable readers.

Overall, the qualitative findings provide invaluable, granular insights into the flipped model's impact. Themes of enhanced engagement, deeper comprehension, increased autonomy, and heightened metacognitive awareness directly and closely align with the quantitative improvements observed in reading comprehension, self-regulated learning, and self-efficacy. Participants' reflections collectively highlight the model's robust ability to foster critical academic skills while promoting a more engaging and supportive learning environment, underscoring the strong potential of flipped instruction to prepare students for independent and collaborative learning contexts.

Discussion

This mixed-methods study examined how flipped reading instruction shaped Iranian EFL learners' reading performance, reading self-efficacy, and reading self-regulation. Quantitative analyses indicated strong improvements across all three outcomes for the experimental group, and the qualitative findings provided clear mechanisms explaining these gains. Together, the results demonstrate how the flipped model supports cognitive, affective, and metacognitive development in L2 reading.

The substantial improvement in reading performance observed for the flipped group—reflected in a large pre- to post-test gain and a significant adjusted advantage in the ANCOVA—closely aligns with earlier evidence showing that flipped learning enhances achievement in language classrooms (Bataineh & Al-Sakal, 2021; Fathi & Barkhoda, 2021; Mohammaddokht & Fathi, 2022; Samiei & Ebadi, 2021; Shahnama et al., 2021; Vitta & Al-Hoorie, 2023). Qualitative reports help clarify why these improvements occurred. Students repeatedly described the model as deepening comprehension, a pattern that supports theoretical arguments regarding the benefits of reallocating instructional time (Bishop & Verleger, 2013) and aligns with the interactive view of reading (Grabe, 1991). Pre-class videos allowed learners to progress at their own pace—often rewatching material until understood—which reduced intrinsic cognitive load and prepared them for more demanding in-class analysis (Sweller, 1988, 1994). The collaborative discussions that followed enabled learners to compare interpretations and articulate reasoning, mirroring the social constructivist principles that emphasize co-constructed meaning (Vygotsky, 1978). These processes are also consistent with findings in the Iranian EFL context, where flipped models have been shown to especially benefit intermediate learners who require both structured

scaffolding and opportunities for autonomous engagement (Abaeian & Samadi, 2016; Ahmed et al., 2022; Wang, 2023).

Similarly, the marked improvement in reading self-efficacy for the flipped group is reinforced by previous studies documenting the positive influence of flipped learning on learners' confidence across various L2 domains (Bi et al., 2023; Fathi & Barkhoda, 2021; Han & Hamzah, 2024; Hsiao et al., 2023; Namaziandost & Çakmak, 2020; Sun et al., 2023). The qualitative evidence closely reflects the four sources of self-efficacy outlined by Bandura (1997). Mastery experiences were strengthened as students used self-paced videos and interactive quizzes to confirm understanding (Bishop & Verleger, 2013; Lai & Hwang, 2016; Samaila et al., 2024). Vicarious experiences emerged through observing peers effectively analyze complex passages, which many students described as reshaping their own sense of capability (Abdullah et al., 2020; Hao & Fang, 2024; Jiang et al., 2022). Verbal persuasion was facilitated by increased opportunities for individualized teacher feedback during class (Bi et al., 2023; Hao & Fang, 2024; Lo & Hew, 2017). Finally, participants noted reduced stress and greater emotional control—consistent with research on anxiety reduction in supportive, autonomy-enhancing contexts (Fan, 2022; Han & Hamzah, 2024; Horwitz et al., 1986; Mohammaddokht & Fathi, 2022)—which further bolstered their willingness to persist (Chuang et al., 2018; Pajares, 1996; Raoofi et al., 2012; Schunk, 1991).

The improvement in reading self-regulation also reflected the mechanisms anticipated in Zimmerman's (2000, 2002) cyclical model. Learners described how the flipped model required proactive planning and time management—central components of the forethought phase—which closely mirrors the goals identified in previous SRL research (Lai & Hwang, 2016; Rezaeyan et al., 2025). During the performance phase, the ability to pause, rewatch, and annotate pre-class materials enabled sustained monitoring of comprehension (Zimmerman, 2000), and many participants reported experimenting with different strategies to identify those most effective for them. These patterns were echoed in descriptions of metacognitive growth, which correspond to findings that flipped instruction can heighten strategic awareness (Cengiz & Ataş, 2025; Öztürk & Çakıroğlu, 2021). In the self-reflection phase, peer and instructor feedback during collaborative in-class tasks provided opportunities to evaluate strategy effectiveness, reinforcing the reflective component essential to SRL development (Hadwin & Oshige, 2011; Park & Kim, 2022; Samadi et al., 2024). Students also highlighted the co-regulatory dynamics that emerged as they supported classmates in navigating challenges (Cengiz & Ataş, 2025), a process that strengthens self-regulation in shared learning environments. Although some studies have reported mixed SRL outcomes in flipped contexts (Sun et al., 2017), the consistent improvements observed here likely stem from the explicit scaffolding and structured learning cycle embedded in the instructional design (Rezaeyan et al., 2025; Öztürk & Çakıroğlu, 2021; Wang, 2023).

Taken together, these findings indicate a coherent and mutually reinforcing relationship between flipped instruction, self-efficacy, and self-regulation. The qualitative evidence demonstrates how enhanced engagement, increased autonomy, and deeper metacognitive awareness created conditions that simultaneously supported higher performance and stronger self-beliefs. Students' reports of feeling

prepared, capable, and in control of their learning reflect the interplay posited by theoretical models in which self-efficacy supports self-regulatory behavior, which in turn promotes persistence and achievement (Doo & Bonk, 2020; Lai & Hwang, 2016; Zimmerman, 2000). Overall, the results show that flipped reading instruction provides an environment that cultivates improved comprehension, greater confidence, and more strategic learning practices. This integrated pattern addresses a notable gap in the literature by examining these outcomes collectively within the under-researched Iranian EFL context, offering evidence that flipped instruction meaningfully supports both cognitive development and learner agency.

Conclusion

This mixed-methods study examined the effects of flipped reading instruction on reading performance, reading self-efficacy, and reading self-regulation among Iranian EFL learners. The integration of quantitative and qualitative evidence demonstrated that a carefully implemented flipped model can substantially enhance all three outcomes. Quantitatively, the experimental group showed statistically significant and meaningful gains across measures, consistently outperforming the control group, with large effect sizes underscoring the pedagogical value of the intervention.

The qualitative findings provided crucial explanatory depth by revealing how the flipped design supported these improvements. Students reported that self-paced engagement with pre-class materials strengthened their foundational understanding and allowed in-class time to be used more productively for collaborative analysis and application. This structure created repeated mastery experiences and opportunities for vicarious learning, contributing directly to increased self-efficacy. At the same time, the requirement to prepare independently fostered greater use of self-regulatory strategies such as planning, time management, and self-monitoring. The development of heightened metacognitive awareness—evident in students' more strategic and reflective approaches to reading—further illustrated the model's capacity to promote learner autonomy. Although some participants noted challenges related to workload and technology access, their overall adaptability highlighted the feasibility of this approach.

Implications

The findings of this study yield several implications for theory, pedagogy, curriculum design, and teacher development in EFL education. Theoretically, the results contribute to a more integrated understanding of how flipped learning shapes the interconnected cognitive, affective, and metacognitive dimensions of reading. Examining reading performance, self-efficacy, and self-regulation simultaneously reveals a reciprocal learning system in which gains in self-efficacy—supported by mastery experiences during self-paced pre-class preparation (Bandura, 1997)—appear to encourage stronger self-regulatory behaviors such as planning and monitoring (Zimmerman, 2000), which then reinforce reading performance. This pattern lends empirical support to broader models linking agency, regulation, and achievement in technology-enhanced environments (Doo & Bonk, 2020; Lai & Hwang, 2016) and underscores how flipped instruction can strengthen autonomy, competence, and relatedness in line with Self-Determination

Theory (Deci & Ryan, 1985). Importantly, the study extends these theoretical claims to the Iranian EFL context. While large-scale syntheses report global benefits of flipped learning (Shahnama et al., 2021; Vitta & Al-Hoorie, 2023), the present findings offer contextualized evidence that clarifies which pedagogical effects appear universal and which likely require adaptation to local learning cultures. The reported increase in students' "heightened metacognitive awareness and strategic reading behavior" (Qualitative Theme 5) further enriches theory by illustrating how time redistribution in flipped environments can enhance conscious, deliberate metacognitive control, complementing outcome-oriented perspectives with clearer process explanations.

In practical terms, the study provides several implications for instructional design and implementation. For EFL teachers, the results provide clear evidence that well-structured flipped reading instruction can strengthen comprehension, confidence, and independent learning. Effective design requires purposeful pre-class tasks—brief instructional videos, scaffolded readings, and interactive online quizzes with timely feedback—and careful use of class time for collaborative discussion, peer explanation, and strategy application. Within this model, teachers function primarily as facilitators who provide individualized guidance and feedback, an approach that appears particularly effective for intermediate learners (Abaeian & Samadi, 2016). For curriculum developers, the consistent advantages observed here support embedding flipped components into existing reading programs, with attention to seamless integration of digital platforms and in-class collaborative structures to reinforce both strategic competence and learner autonomy. For teacher educators, the findings highlight the need to prepare instructors not only to produce or curate digital materials but also to manage interactive, student-centered classrooms. Training should therefore include skills in orchestrating group work, delivering targeted feedback, identifying students' regulatory needs, and explicitly teaching strategies such as time management and goal setting, while also addressing common challenges such as uneven preparation. Finally, for students, the study underscores the importance of assuming an active role in pre-class learning, seeking clarification when needed, and engaging in group activities. Helping learners recognize how self-paced preparation and interaction with peers contribute to both competence and confidence may encourage them to use the flipped model more effectively.

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