Examining Deep Learning's Effects on Critical Reading and

Self-Regulation in Female EFL Students

Khalid Mohammed Alwahibee
Imam Mohammed Bin Saud Islamic University

alwahibee@hotmail.com

Muneera Falah Alotaibi
Post graduate student at English Department at
Imam Mohammed Bin Saud Islamic University

Muneerafalah86@gmail.com

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الملخص

بحثت هذه الدراسة في تأثير التعليم القائم على التعلم العميق على مهارات القراءة النقدية والتنظيم الذاتي بين طلاب السنة الأولى في جامعة الإمام محمد بن سعود الإسلامية. وشمل البحث ثمانين طالبة جامعية سعودية يدرسن اللغة الإنجليزية كلغة أجنبية (EFL) في ذات الجامعة. تم تقسيم الطلاب إلى مجموعة تجريبية، تلقت تعليمات قائمة على التعلم العميق، ومجموعة ضابطة، اتبعت أساليب الفصل الدراسي التقليدية. استخدمت الدراسة تصميم بحث مختلط الأساليب، وجمع البيانات الكمية من خلال استبيانات القراءة النقدية والتنظيم الذاتي، بالإضافة إلى اختبار ما بعد الفصل. تم جمع البيانات النوعية من خلال ملاحظات الفصل. أشارت النتائج إلى أن المجموعة التجريبية تفوقت على المجموعة الضابطة في الاختبار ما بعد الفصل، وأسفرت استبيانات التنظيم الذاتي والقراءة النقدية عن نتائج إيجابية. وتختتم الدراسة بالآثار التربوية التي تقدم فيها أدوارًا عملية للمعلمين لتحسين اللغة الإنجليزية كلغة أجنبية (EFL) في الفصول الدراسية. علاوة على ذلك، قدمت بعض الاقتراحات لإجراء المزيد من البحوث لتوسيع عدد الموضوعات، والتأثير المحتمل للعوامل الديموغرافية والثقافية والبيئية، واقتراحات أخرى.

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Abstract

This study investigated the impact of deep learning-based instructions on critical reading skills and self-regulation among freshman English learners at Imam Mohammad ibn Saud Islamic University (IMSIU). The research involved eighty Saudi female university students studying English as a foreign language (EFL) at IMISU. The students were divided into an experimental group, which received deep learning-based instruction, and a control group, which followed traditional classroom methods. The study employed a mixed-methods research design, collecting quantitative data through critical reading and self-regulation questionnaires, as well as a posttest. Qualitative data was gathered through class observations. The results indicated that the experimental group outperformed the control group in the posttest, and the self-regulation and critical reading questionnaires yielded positive outcomes. The study concludes with pedagogical implications in which it offers practical roles for teachers to improve English as a Foreign Language (EFL) in classrooms. Moreover, it gave some suggestions for further research to expand the number of subjects, the potential influence of demographic, cultural, and environmental factors, and other suggestions.

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Introduction

Background

Reading plays a crucial role in academic, social, and personal development, providing both pleasure and the necessary skills for success in various aspects of life (Anderson et al., 1985). It is an interactive process where readers construct meaning through their engagement with the text (Durkin, 1993). Snow (2001) emphasized the interactive nature of reading, stating that it involves extracting and constructing meaning through engagement with written language. Critical reading enhances higher-order thinking skills by enabling learners to evaluate, infer, and draw conclusions based on evidence.

Critical reading involves analyzing a text to identify patterns, information, values, assumptions, and language usage (Kurland, 2004). It helps students become better readers and thinkers by encouraging them to view reading as a process rather than a product, and by developing skills to analyze, synthesize, and evaluate what they read (Abd Kadir et al., 2014). Therefore, it is essential to expose and teach students how to be critical readers.

Self-regulation, as highlighted by Cohen (2012), is vital for effective learning. Students need to develop the ability to self-regulate and monitor their thinking processes. Zimmerman (2000a) defined self-regulation as self-generated thoughts, feelings, and actions that are planned and adapted to achieve personal goals. Self-regulatory processes include goal setting, self-monitoring, self-evaluating, self-consequences, environmental structuring, and seeking help (Kitsantas, 2002). Self-regulation influences learners' performance, metacognition, intrinsic motivation, and strategic actions (Sun, 2014). It allows learners to plan, set goals, organize, self-monitor, self-evaluate, and be self-aware and knowledgeable in their learning approach.

More recent studies have further emphasized the importance of self-regulation for student success. Wang and Sperling (2020) found that students who demonstrated stronger self-regulation skills performed better academically and were more engaged in their learning. Additionally, Zimmerman and Schunk (2021) highlighted the crucial role of self-regulatory strategies, such as time management and task planning, in helping students adapt to the challenges of remote and hybrid learning environments during the COVID-19 pandemic. These findings underscore the need to explicitly teach and support the development of self-regulation skills in educational settings.

Deep learning, as described by Biggs (1999), involves seeking meaning, understanding concepts, evaluating patterns, and critically examining information. It leads students to connect ideas, relate them to their experiences, and critically evaluate for patterns and meanings. Deeper learning enables individuals to transfer knowledge and apply it to new situations (Pellegrino & Hilton, 2012). It fosters domain expertise and the ability to apply knowledge to solve problems. Teaching practices that promote deeper learning create a positive learning community, promoting content knowledge and interpersonal competencies (Pellegrino & Hilton, 2012).

Research on approaches to learning supports the positive correlation between a deep approach and making connections, resolving misunderstandings, reflecting on understanding, and examining the logic of arguments within a text (Biggs, 1993; Veeman et al., 2003). In contrast, a surface approach is associated with reproducing text content by summarizing or repeating it and passive misunderstanding (Biggs, 1993; Veeman et al., 2003). A deep approach involves higher-level questions that integrate knowledge and make predictions, while a surface approach focuses on basic facts and procedures (Chin & Brown, 2000). A deep approach to reading involves higher-order cognitive skills such as analysis, synthesis, problem-solving, and metacognitive thinking (Hermida, 2016). Deep readers focus on the author's message, ideas, argument structure, and make connections with prior knowledge, applying this understanding to new contexts.

Wong's (2016) study found that Saudi students faced unique academic challenges, particularly regarding critical reading skills. Despite demonstrating strong memorization of grammatical rules, the students struggled with basic text comprehension. They were especially unable to respond effectively to open-ended questions requiring critical thinking, such as those focused on interpreting purpose or meaning. Wong attributed these difficulties to the predominant teaching approaches in the Saudi education system, which heavily emphasize rote memorization (surface learning) rather than developing deeper understanding. The curriculum typically relies on conventional methods like audio-lingual and grammar translation, which may not sufficiently foster critical thinking abilities.

To address these needs, Wong (2016) designed a specialized academic reading curriculum. This approach provided "explicit instruction in the critical thinking strategies" (p. 62) while also offering scaffolding support to improve the Saudi learners' text comprehension and critical analysis skills. The goal was to tailor the instructional methods to better meet the unique learning requirements of this student population.

Saudi students face unique challenges in critical reading due to the memorization-based education system and reliance on traditional teaching methods (Wong, 2016). Wong's curriculum aimed to address these challenges by providing explicit instruction in critical thinking strategies and scaffolding support. Therefore, for this study, deep learning-based lessons were designed and pre- and post-tests were administered to measure skill acquisition over time. A critical reading and self-regulation questionnaire were also administered, and qualitative data was collected through class observations. The study analyzes both qualitative and quantitative data to examine the effect of deep learning-based instruction on critical reading skills and self-regulation.

Statement of the Problem

Due to the lack of studies investigating the effect of deep learning instruction on female Saudi students' critical reading and self-regulation, the current study aims to build upon Alotaibi's (2013) findings by exploring the impact of deep learning-based instruction on critical reading skills and self-regulation among first-year female students at Imam Mohammed ibn Saud Islamic University.

Alotaibi (2013) conducted a mixed-method study to explore the relationship between male Saudi students' academic achievement and self-regulated learning. The findings indicated a

positive correlation between self-regulated learning and students' performance, as well as their ideals of their future selves. However, despite the significance of critical reading for language learning, several previous studies (Wong, 2016) have revealed that it is often neglected in English language teaching. Additionally, research on self-regulation has emphasized the need for language learners to regulate their own performance and behaviors. Various studies (Jenson, 2011; Naseri & Motallebzadeh, 2016) have stressed the importance of fostering learners' self-regulation abilities.

In our own experiences as educators and students at Saudi universities, we have observed that self-regulation strategies are not given due attention in teaching practices. While lesson goals are introduced, the personal goal setting of learners is rarely addressed in the classroom. Furthermore, there is a lack of formative or summative assessment of self-regulated strategies, even when they are taught.

This study aims to address these gaps by investigating the effects of deep learning-based instruction on the development of critical reading skills and self-regulation among female Saudi freshmen at Imam Mohammed ibn Saud Islamic University in Riyadh. It is worth noting that this study differs from Alotaibi's (2013) research, as it focuses specifically on female students to contribute to the research field in the context of deep learning-based instruction.

Purpose of the Study

The study had four main objectives. Firstly, it aimed to assist freshman students in understanding the significance of critical reading in the context of learning English as a foreign language (EFL). Secondly, it sought to identify the specific critical reading skills that are essential for female freshman EFL learners. Thirdly, the study aimed to examine the effectiveness of deep learning in enhancing the critical reading skills and self-regulation abilities of female freshman EFL learners. Lastly, it aimed to propose an observation, and a hypothesized treatment plan based on a deep-learning approach, with the intention of fostering the development of critical reading skills and self-regulation among female freshman EFL learners. These objectives collectively formed the foundation for the study and guided its research methodology and analysis.

Significance of the Study

This study addresses a gap in teaching reading in Arab universities, specifically the lack of deep-learning and higher-order thinking skills among Saudi students. A curriculum was developed to help learners critically comprehend and evaluate texts using deep learning-based instructions, aiming for improved results. The study aims to change reading instruction in undergraduate classes at Al-Imam Mohammad ibn Saud Islamic University, and this approach can be adopted by other Saudi universities seeking innovative methods to motivate students and implement deep learning-based instruction.

Research Questions

This study answered the following questions:
1. What is the effect of the deep learning-based instruction on freshman female EFL learners' critical reading skills?
2. What is the effect of deep learning-based instruction on freshman female EFL learners' self-regulation?

3. How effective is the proposed instruction in evolving freshman female EFL learners' attitudes towards reading?
4. How can a deep learning-based instruction be integrated in freshman female EFL learners' reading classes?

Literature Review

Theoretical Framework

Deep learning, introduced by Marton and Säljö (1976), encompasses higher-order thinking skills and a personal commitment to acquiring knowledge. It enables learners to transfer concepts to different situations, resulting in a rich network of knowledge and understanding. Deep learning leads to qualitative goals and emotional and cognitive development. Motivation plays a crucial role, with learners employing either deep or surface-learning strategies. Surface learning focuses on achieving minimum effort for passing grades, lacking the knowledge transfer of deep learning. The deep learning process involves a recursive cycle that moves from specialized to integrated approaches, incorporating experience, reflection, thought processes, and action.

Borredon et al. (2011) describe a three-level learning process. The first level emphasizes performance and specialized learning styles, while the second level focuses on interpretation and learning-oriented approaches. The third level is integrative and development-oriented, involving all four modes of learning. Traditional lecture-based instruction primarily addresses the first level, but incorporating practical applications and reflection taps into the second level. The third level is stimulated by additional learning opportunities and collective reflection, linking experience with conceptual knowledge.

Deep learning is associated with learner-centered methodologies that enhance metacognitive skills and promote deeper understanding. Fink (2003) presents a taxonomy encompassing foundational knowledge, application, integration, human dimension, caring, and learning how to learn. Interactivity and interchangeability among these categories are crucial for deep learning, fostering significant and long-lasting knowledge. Constructivism, emphasizing active engagement, problem-solving, and collaboration, is closely related to deep learning.

Deep learning approaches differ from surface learning in terms of student engagement, contentment, and understanding. Internal motivation is often associated with deep learning, while external motivation is more common in surface learning. Students typically employ both levels of learning, gradually transitioning to critical thinking and higher-order skills. As educators encourage greater involvement and progress through the taxonomy, assimilation, synthesis, reflection, and self-commitment become essential elements.

Functional Definitions

Deep Learning: "The deep approach arises from a perceived need to engage with the task appropriately and meaningfully, so the student tries to use the most appropriate cognitive activities for handing it." (Biggs, 2003, p. 16)

Critical Reading: Critical reading is defined as "a dialogue between the reader and the text" (Grabe, 1988, p. 56).

Self-Regulated Learning (SRL): According to Zimmerman (1989), self-regulated learning (SRL) is defined as "the degree to which students are metacognitively, motivationally, and behaviorally active participants in their own learning process" (p. 329).

Surface Learning: "The surface approach arises from an intention to get the task out of the way with minimum trouble while appearing to meet the course requirements" (Biggs, 2003, p. 14).

Deep Learning

Rhem (1995), McKay and Kember (1997), as cited in Millis (2010), identified four key characteristics of deep learning. Firstly, deep learning involves a knowledge-based system that focuses on understanding and integrating information, leading to a cumulative learning experience. Secondly, learners need to have an appropriate level of motivation, with intrinsic motivation being maximized, in order to develop a sense of ownership and engagement with the material. Thirdly, deep learning requires active learner participation, emphasizing active learning rather than passive learning. Finally, interaction and collaboration with others, whether it be with teachers or fellow students, are essential components of deep learning-based instruction.

Critical Reading

Reading has been the focus of numerous research studies due to its importance in interpreting messages and acquiring information from texts. Pretorius (2010) found a strong correlation between reading proficiency and academic success, highlighting that increased reading leads to higher grades. Critical reading, as described by Duncan (2014), goes beyond interpreting messages and involves analyzing and evaluating texts.

Scholars have demonstrated the positive impact of critical reading strategies on reading comprehension and performance (Abd Kadir et al., 2014). Nasrollahi et al. (2009) define critical reading as examining evidence, evaluating arguments, considering limitations, assessing interpretations, and deciding the extent to which the reader accepts the authors' arguments. Teaching critical reading strategies is essential for developing this skill (Critical Reading Strategies, 2009). Salisbury University (2009) identifies seven strategies for critical reading, such as previewing, questioning, reflecting, evaluating, and comparing, which foster deep learning and understanding of the text.

Yu (2015) suggests that strong reading skills correlate with strong writing skills. Therefore, this research aims to provide instructional guidelines for educators to help struggling readers become better readers, writers, and academic performers by implementing critical reading strategies within deep learning-based instruction and self-regulated learning (SRL). Critical reading is a valuable skill and very important which is becoming increasingly rare among college graduates. Unlike passive reading, critical reading involves analyzing texts and evaluating their impartiality. It consists of three stages: analyzing what is said, what the text does, and what it means. Foorman and Torgesen (2001) emphasize the importance of critical reading skills for university students, as they enhance literacy and enable students to distinguish between biased and objective information.

In the business world, critical reading skills are also essential. Cameron (2008) highlights the significance of critical reading in contract signing, where careful examination is necessary

to identify adverse provisions. Critical reading is also crucial when reviewing financial statements and other documents for making informed decisions, according to Halpern (2003).

Self-Regulated Learning

Distinguishing self-regulation from mental capacity or academic achievement is crucial. Self-regulation involves the process of self-direction and encompasses a range of activities that enable learners to convert their mental skills into abilities (Zimmerman et al., 2002). Over time, these abilities can develop into habits through guided positive reinforcement (Butler, 2002) under the supervision of educators (Paris & Paris, 2001).

Building on this foundation of self-regulation, Zimmerman (1998a) identified two categories of self-regulated learners: metacognitively active learners and behaviorally self-regulated learners. These learners possess several characteristics, including self-awareness, knowledge, decisiveness in learning, intrinsic motivation, seeking information and advice, self-instruction ability, and self-initiation and management. Self-regulated learners, regardless of their age or abilities, are more likely to excel academically and have an optimistic outlook on their future. This allows teachers to adopt learner-centered approaches and strive for excellence among their students.

In the field of education, various models of self-regulated learning (SRL) are utilized, including problem-based learning, distance learning, scenario-based learning, self-directed learning, and self-planned learning. While these models may differ, they all share common characteristics that form the foundations of SRL, such as self-motivation, personal learning commitments, reflective thinking, and performance assessment. Rehearsing, explaining, and illustrating concepts using written or visual aids is an integral part of acquiring and utilizing information. These strategies, as suggested help students connect their learning to real-life experiences, enhancing long-term memory retention. Various approaches proposed by Cepeda (2006) have also proven effective in improving recall, such as diversifying subjects or activities in different settings instead of repetitive sessions focused solely on one subject.

Modifying the learning environment contributes to memory retrieval and retention. By managing their physical, emotional, and psychological environment and avoiding procrastination, students take responsibility for their learning. Self-regulated learners strive to become logical thinkers rather than exhibiting worrisome or perfectionistic tendencies. Standard schooling often lacks teaching aids and encourages a fixed approach to learning, limiting students' ability to think reflectively and develop their own personalized learning methods.

Zimmerman (1998b) identified three phases of self-regulated learning: the forethought phase, characterized by metacognitive techniques and preparation; the performance phase, focused on executing plans, monitoring progress, self-instruction, and fostering learner autonomy; and the self-reflection phase, where students assess their own performance and formulate strategies for future assignments. These phases form a learning cycle that supports self-regulated learning.

Previous Studies

Upon reviewing several studies in this regard, we can summarize the effects as follows:

Hattie and Donoghue's (2016) model of learning identifies various strategies that foster metacognition and self-regulated deeper thinking. These include elaboration, organization, strategy monitoring, concept mapping, metacognitive strategies, self-regulation, and elaborative examination. Building on this, Hall et al. (2004) found that integrating positive changes in the educational setting can impact the learning styles of first-year accounting students. Deep approaches to learning, such as extensive reading, making text connections, and connecting information to prior knowledge, were associated with increased use. Moreover, some studies have emphasized the importance of understanding students' interests, skills, and educational contexts in promoting deep learning. For instance, Phillip and Graeff (2014) introduced a simulation to an accounting class, recommending active learning strategies to prepare students for real-world experiences and connect abstract concepts to practical applications.

Similarly, Tochon (2013) discovered that deep learning combined with blended learning and self-regulated projects increased students' self-sufficiency, curriculum authority, and oral proficiency in English. Expanding on this, Wang's (2013) study highlighted the positive impact of higher-order education, integrative learning, and reflective learning on developing lifelong learning tendencies and intellectual growth. Furthermore, Offir et al. (2008) investigated the effects of synchronous versus asynchronous deep learning in a distance learning system, revealing positive impacts on student achievement. This body of research underscores the multifaceted nature of deep learning and the need for tailored instructional approaches to foster it effectively.

The significance of deep-learning approaches in various educational contexts, including language learning and distance education, and emphasize the importance of active learning strategies and creating developmentally appropriate learning environments. The integration of deep learning in education has significantly transformed teaching and learning practices. Dede (2014) highlights the necessity of using technology to enrich content and pedagogy while fostering connections between in- and out-of-class learning. Digital teaching platforms (DTPs) facilitate methods like case-based instruction and collaborative learning (Dieterle, 2009). Initially focused on knowledge-based approaches, the scope of deep learning has expanded to include learning diagnostics and analytics (Luckin et al., 2016), with applications in special needs education, such as early dyslexia detection.

Studies indicate that deep learning strategies improve critical reading skills among EFL students (Chen & Dhillon, 2012; Hermida, 2009) and enhance self-regulated learning (Ghasemi & Dowlatabadi, 2018). This body of research demonstrates the diverse benefits of deep learning, promoting critical thinking, reading proficiency, and self-regulation in students. Sun et al. (2022) found that deep learning activities in blended environments enhance academic competencies and cognitive development, fostering intrinsic motivation, critical thinking, and collaboration skills. Learners using these strategies achieve higher pass and merit rates, indicating improved academic performance.

Hật and Le (2023) reported a positive correlation between completed assignments and assessment performance, with reflective writing exercises improving content retention and higher-order thinking. These studies highlight the effectiveness of instructional strategies that encourage active engagement and advanced cognitive processes, suggesting that increased learning activities and reflective practices can sustain deep learning among students.

Critical reading from a critical literacy perspective in English as a Foreign Language (EFL) has received limited focus. Park (2011) found that integrating critical literacy practices, like analyzing news articles and peer discussions, enhanced EFL students' skills in Korea. Macknish (2011) showed that Chinese EFL students in Singapore could uncover hidden messages in texts through peer interactions, indicating critical thinking can develop regardless of language proficiency. Ko (2013) highlighted effective instructional strategies for promoting critical literacy. Le et al. (2024) emphasized the need for critical reading education to balance lower and higher-order thinking skills, recognizing linguistic proficiency as essential for effective critical reading.

Self-Regulated Learning (SRL), developed by Barry Zimmerman, involves learners managing their cognition, actions, emotions, and incentives to achieve goals. The SRL cycle includes prediction, performance, self-reflection, and self-reaction, allowing students to set goals and evaluate their work. Research shows a positive link between SRL interventions and academic performance, with studies by Ahmad (2007) and Muhammad and Abu Bakar (2015) indicating that enhanced SRL skills correlate with higher achievement. Additionally, deep learning is tied to self-regulation, as shown by Kollerup (2015) and others. Junaštíková (2024) noted a connection between SRL and technology post-COVID-19, highlighting teachers' roles in fostering SRL skills. Ultimately, SRL is vital for lifelong learning and can significantly improve academic outcomes, especially for disadvantaged learners.

Methodology

Research Design and Procedures

A mixed-methods research design was used in this study, incorporating two quantitative approaches: a quasi-experimental method and a survey to explore students' attitudes toward critical reading and self-regulation. Permission was obtained from the English department at IMISU in Riyadh, and two sections were randomly selected—one as the control group taught by a regular teacher, and the other as the experimental group taught by a researcher. The experimental group received additional deep learning-based instruction alongside the standard curriculum. Pretests established a baseline, and after several weeks of instruction, a posttest was given in Week 7 to assess the instructional impact.

Participants

The research participants were 80 Saudi students aged 18 to 20, with English proficiency levels ranging from A1 to B2. Two sections of a Level 1 reading course were randomly selected, each with 40 students. One section served as the control group, receiving standard instruction from the regular teacher, while the experimental group, also with 40 students, was taught by a researcher who included additional reading activities and deep learning-based methods.

Instruments

The study employed the following instruments:
1. Pretest and posttest: The study used these tests to measure students' critical reading skills before and after the experiment.
2. Questionnaires: The study utilized the questionnaire to assess students' attitudes towards critical reading and self-regulation.

3. Observation sheets: This tool would allow the researchers to systematically document the differences in student engagement, critical thinking, and self-regulatory behaviors between the experimental and control groups.

For the critical reading test, the researchers adapted Wallace (2003) test to evaluate a wide range of critical reading skills among EFL students. The test was administered to both the experimental and control groups. Prior to its administration, the researchers checked the validity and reliability of the tests.

To establish the validity of the pre- and posttests, two academic professors evaluated the test. Validity is a key concept in research that refers to the extent to which a study or measure accurately represents or captures what it is intended to measure. Therefore, the research measured different types of validity that research aimed to establish. Face validity was established by presenting the test to a group of students at the same academic level, considering their feedback, and making necessary revisions. Content validity was established by involving academic professors, teachers, and educational supervisors to evaluate the test's relevance, clarity, and appropriateness for the study's participants. Their insights and suggestions were taken into account, resulting in a final test comprising 30 questions, including both open-ended and multiple-choice items.

The researchers assessed the internal consistency validity by calculating Pearson's correlation coefficients between each test question's score and the total test score. The obtained correlation coefficient values (0.482 to 0.736) were statistically significant, indicating the consistency and applicability of the test questions to the study's sample.

Reliability of the Reading Pre- and Posttests

The study employed a test repeat (stability) method to determine the reliability of the pre- and posttests. The test was administered twice with a 2-week gap, and the Pearson correlation was calculated. After the initial test, the experimental group received deep learning-based instruction. A posttest focusing on critical reading skills was conducted to assess participants' progress. The test booklets were scored using rubrics, and manual scoring was performed. The percentages for both groups were calculated, and statistical analysis was conducted using SPSS. The correlation coefficient between the two test applications was found to be 0.637, which was statistically significant at the 0.01 level. This indicates that the test repeat method demonstrated reliability, suggesting that the test is consistent and can be depended upon to provide accurate results when administered to the main sample.

Table 1

Pearson Correlation Coefficient between the Two Application Scores of the Reading Test

Variables	Correlation Coefficient	Sig
Pre	0.637**	0.01
Post	0.694	0.01

Questionnaires
First: Self-Regulation Questionnaire

For this research, Brown et al.'s (1999) questionnaire was used. It was modified to investigate self-regulation in Saudi female university students studying English as a Foreign Language (EFL). The questionnaire employed a Likert scale with mainly closed-ended statements having five response options. Closed-ended statements are advantageous due to their straightforward coding and tabulation. Additionally, the questionnaire included positive or negative statements rated on a five-point Likert scale. The statements were developed following recommendations for brevity, natural language, and the avoidance of ambiguity or loaded words. Descriptive statistics were used to analyze the collected data, with a sample size of 80 students providing diverse perspectives.

Second: Critical Reading Attitude Questionnaire

Most items included in the questionnaire were derived from the attitude toward reading questionnaire developed by Yildirim and Söylemez (2018). The aim of the questionnaire survey conducted in this study was to explore the attitude of Saudi female university students towards critical reading classes in the English as a Foreign Language (EFL) context.

Validity
Validity for Self-Regulation Questionnaire

For this purpose, face validity and internal validity were measured. For the face validity, few professors evaluated the questionnaire. Accordingly, some statements were modified in the final version of the questionnaire. As for the internal validity, the Correlation Coefficients between each statement and the total score on the self-regulation questionnaire were calculated and ranged between 0.509 and 0.860. The results show that all correlation coefficient values were statistically significant. This indicates the consistency of test questions and their applicability to the study's main sample.

Validity for Critical Reading Attitude Questionnaire

For this purpose, face validity and internal validity were measured. For the face validity, the same professors evaluated the questionnaire. Accordingly, some statements were modified in the main questionnaire. As for the internal validity, the Person Correlation Coefficients between each statement and the total score on the Critical Reading attitude questionnaire were measured and ranged between 0.565 and 0.940. The results show that all correlation coefficient values were statistically significant. This indicates the consistency of test questions and their applicability to the study's main sample. The results indicate significant correlations between all statements in the critical reading questionnaire and its total score, with significance levels ranging from 0.05 to 0.01. These correlation coefficient values confirm the consistency between the participants' responses to the statements and their effectiveness in measuring the intended purpose of the questionnaire.

Reliability
Reliability for the Self-Regulation Questionnaire

To assess the reliability of the self-regulation questionnaire, two methods were employed: Cronbach's alpha coefficient and the split-half method using Guttman's equation. This was necessary due to the uneven split of the questionnaire statements, as the number of statements was odd. The reliability coefficients are presented in Table 2.

Table 2

Cronbach's Alpha and Split-Half Coefficients of the Self-Regulation Questionnaire

Self-Regulation Questionnaire	Cronbach's Alpha Coefficient	Split-Half Reliability	
		Two Parts Correlation Coefficient	Split-Half Reliability Coefficient
	0.977	0.986	0.993

The results displayed in Table 6 demonstrate that the self-regulation questionnaire exhibited high reliability. The Cronbach's alpha coefficient was 0.977, and the split-half reliability coefficient was 0.993, both of which are statistically acceptable values. These findings indicate strong internal consistency and suggest that the questionnaire can be relied upon to yield accurate results when administered to the main sample of the study.

Reliability of the Critical Reading Questionnaire

The reliability of the critical reading questionnaire was assessed using two methods: Cronbach's alpha coefficient and the split-half method with Guttman's equation. This was necessary due to the uneven split of the questionnaire phrases, as the number of phrases was odd. The reliability coefficients are displayed in Table 3.

Table 3

Cronbach's Alpha and Split-Half Coefficients of Critical Reading Questionnaire

Critical Reading Questionnaire	Cronbach's Alpha Coefficient	Split-Half Reliability	
		Two Parts Correlation Coefficient	Split-Half Reliability Coefficient
	0.976	0.903	0.948

The findings in Table 9 reveal that the critical reading questionnaire demonstrated high reliability. The Cronbach's alpha coefficient was 0.976, and the split-half reliability coefficient was 0.948, both of which are statistically acceptable values. These results indicate strong internal consistency of the critical reading questionnaire. Consequently, it can be trusted to yield accurate results when applied to the main sample of the study.

Data Analysis

Mixed-methods research combines quantitative and qualitative data collection and analysis to gain a deeper understanding of a research problem. In this study, data were collected through a critical reading test, a self-regulation questionnaire (quantitative data), and a critical reading

questionnaire (qualitative data). Various methods, such as stability reliability, Cronbach's alpha coefficient, and split-half reliability coefficient, were used to ensure the reliability of the questionnaire. The Pearson correlation coefficient measured the validity of the study tools. Descriptive and analytical statistics, including frequency calculations, means analysis, standard deviation, independent samples t-test, and paired samples t-test, were performed. Effect size calculations, using eta squared (η2) for independent groups and Cohen's d indicator (Cohen's d) for paired groups, determined the impact of deep learning-based instruction on critical reading skills and self-regulation in EFL learners.

Tools for Data Analysis

To meet the research goals and analyze the data, the researchers used the software package SPSS (version 21). Descriptive statistics, such as frequency calculations for counts and percentages, were performed. A significance level of $p < 0.05$ was considered statistically significant.

Results and Discussion

Results of Research Questions

To answer the first question, the researchers administered a pretest of critical reading skills to both the experimental and control groups in this study to ensure that the two groups statistically comparable. We measured the mean and standard deviation values of the test results based on the group variable (experimental or control) during the pretest.

We conducted an independent sample t-test to know if there were any significance differences in mean scores between the experimental and control groups in the critical reading skills test. See Table 4 for the results.

Table 4

M, SD, and T-Test for the Experimental vs Control Groups in the Pre-application of the Critical Reading Skills Test

Level	Application	Group	Number	Mean	Standard Deviation	T Value	Value of Significance A	Level of Significance 0.05
Overall Score of Critical Reading Skills Test	Pre	*Control*	40	26.22	3.57	0.713	0.478	Not statistically significant

According to the results presented in Table 4, there were no significant differences found between the experimental and control groups in their performance on the pretest of critical reading skills. The value of t for the total score on the test was 0.713, and its significance level was higher than the predetermined threshold ($0.05 \geq \alpha$). This indicates that the two groups, the experimental and control, were equivalent in terms of their mastery of critical reading skills prior to the start of the experiment. Therefore, any changes observed in the level of critical reading skills among students in the English language department is attributed to the independent variable of the experiment, which is the deep learning-based instruction.

To answer the second, the researchers tested and confirmed the following hypothesis "There are no statistically significant differences at the level of 0.05 ≥ α between the mean scores of the experimental group of students (who studied according to deep learning-based instruction) in the pre- and post-applications of the self-regulation questionnaire."

To test and confirm the hypothesis, the means and standard deviations of the experimental group's scores were computed for both the pre- and post-application of the self-regulation questionnaire. The t-value was then employed to compare the means of the control and experimental groups. See Table 5.

Table 5

M, SD, and T-Test Results, Differences Among the Means of the Experimental Group in the pre- and Post-applications of the Self-Regulation Questionnaire

Level	Group	Application	N	M	SD	T Value	Value of Significance A	Level of Significance 0.05	(Effect Size)
Total Score of Self-Regulation Questionnaire	Experi-mental	Pre	40	3.17	0.248	10.649	0.000	Statistically significant	1.68 **(Great)**

Table 5 reveals a significant statistical difference between the scores of the experimental group of students in the pre- and post-application of the self-regulation questionnaire. The t-value for the differences between the pre- and post-application scores on the total score of the self-regulation questionnaire was 10.649, with a statistical significance of 0.000, which is lower than the predetermined significance level of 0.05 ≥ α. Consequently, the null hypothesis is rejected, and the alternative hypothesis is accepted. It says, "There are statistically significant differences at the level of 0.05 ≥ α between the mean scores of the experimental group of students (who studied according to deep learning-based instruction) in the pre and postapplication of the self-regulation questionnaire." Table 5 also shows that the mean score of the experimental group of students' performances was 3.66, while the mean score of the control group of students' performances in the pre-application on the same questionnaire items was 3.07 out of a total score of 5. Furthermore, as the mean score in the post-application phase was higher than that of the pre-application phase, it indicates that the trend of differences favors the post-application.

Table 5 also presents the Cohen's d indicator value for the total score, which was calculated as 1.68. This indicates that the independent variable of deep learning-based instruction plays a direct role in the observed differences between the pre- and post-application of the self-regulation questionnaire. Consequently, it suggests that deep learning-based instruction has a significant effect on the development of self-regulation among the students in the English Language Department.

To answer the third question, the researchers collected data from the experimental group, including the frequency, percentages, standard deviations, and means of their responses for each item in the critical reading questionnaire. These measurements were used to analyze the results and determine the order of importance for each item in descending order.

Table 6 (in the Appendix) presents the findings that indicate the experimental group had positive attitudes towards critical reading. The overall mean score for their responses to the total questionnaire was 4.36 out of 5.00, and the p-value (sig) was lower than the predetermined level of significance ($0.05 \geq \alpha$). This suggests that the mean score of the experimental group's responses surpassed the agreement threshold (3), indicating that the individuals in the experimental group generally had positive responses to the paragraphs in the critical reading questionnaire.

Table 6

General Results for the mean, S.D, T. value, P. Value for All Items for the Experimental Group

General Results	Mean	S. D	T-Value	P. Value
	4.36	0.421	20.443	0.000

Furthermore, there was consensus among the individuals in the experimental group regarding their attitudes towards critical reading. The questionnaire consisted of 33 statements, with mean scores ranging from 3.92 to 4.65. The p-values (sig) for these statements were also lower than the proposed level of significance ($0.05 \geq \alpha$). This indicates that the mean scores for the responses to these statements exceeded the agreement threshold (3), demonstrating the positive attitudes of the experimental group towards the statements on the critical reading questionnaire.

When the statements were ranked in descending order based on the degree of agreement, they came as follows:

1. Statement 4 had a mean of 4.70 out of 5, a standard deviation of 0.564, and a p-value (sig) lower than the proposed significance level ($0.05 \geq \alpha$).
2. Statement 33 had a mean of 4.65 out of 5, a standard deviation of 0.533, and a p-value (sig) lower than the proposed significance level ($0.05 \geq \alpha$).
3. Statement 29 had a mean of 4.62 out of 5, a standard deviation of 0.540, and a p-value (sig) lower than the proposed significance level ($0.05 \geq \alpha$).
4. Statement 12 had a mean of 4.62 out of 5, a standard deviation of 0.586, and a p-value (sig) lower than the proposed significance level ($0.05 \geq \alpha$).
5. Statement 28 had a mean of 4.60 out of 5, a standard deviation of 0.545, and a p-value (sig) lower than the proposed significance level ($0.05 \geq \alpha$.

See Table 7 for the rearrangement of all statements based on students' responses.

To answer the fourth question, the researchers followed few steps to answer this question:
Step One
The data from the pre- and post-application of the critical reading test and self-regulation questionnaire were analyzed. The results indicated that the independent variable of deep learning-based instructions was responsible for an increase in the mean score of the experimental group. The pretest t-value for the total score of the test, comparing the control and

experimental groups, was 0.713. Its significance was greater than the predetermined level ($0.05 \geq \alpha$), indicating equivalence between the two groups. The difference in mean scores between the experimental group (33.27) and the control group (28.15) in the post-application of the test suggests that deep learning-based instructions contributed to the development of critical reading skills.

Furthermore, the statistical analysis of the self-regulation questionnaire in both pre and post-application indicates an increase in the use of self-regulated learning (SRL) strategies in the responses of the experimental group, which received deep learning-based instructions. The mean score of the experimental group's performance on the questionnaire was 3.66, while the mean score of the control group's performance in the pre-application was 3.07 out of a total score of 5. As the mean score in the post-application phase was higher than the pre-application mean, it suggests that deep learning-based instructions contributed to the development of SRL in the experimental group.

Step Two

The researchers conducted face-to-face and online class observations of both groups and found that students in the experimental group were more engaged and aware of cognitive and metacognitive processes. Three observation visits were made, with results indicating that deep learning-based instruction helped students enhance their critical reading skills and develop self-regulated learning (SRL) techniques, fostering autonomy. The experimental group showed a strong sense of responsibility for their learning, with observation results falling in the positive continuum (very high to high), while the control group's results were in the negative continuum. This finding was supported by questionnaire results. (See Tables 8 and 9)

In contrast, the control group, which used traditional instructional methods, did not exhibit improvements in critical reading skills or self-regulation. To validate these findings, the researchers interviewed the control group's instructor. The interview revealed that, after four weeks of instruction, there was no significant difference in the students' use of critical reading skills and self-regulated learning compared to their initial state.

Step Three

The researchers worked together with English Language instructors from IMSIU's Department of English Language to investigate the impact of incorporating deep learning-based instructions on freshmen students in their reading course. The majority of instructors agreed that deep learning-based instruction should be implemented at the university, considering that many students relied on surface learning strategies solely to pass the course. They also recognized the importance of teaching students self-regulated learning (SRL). The teachers further recommended that teachers receive professional training to effectively utilize deep learning-based strategies and a cognitive and metacognitive training package in the classroom, thereby maximizing the benefits of deep learning and SRL.

Based on the data collected from tests, questionnaires, and the responses from the focus group, it is reasonable to conclude that integrating deep learning-based instructions and strategies at the university level will enhance students' development of critical reading skills and self-regulation. By prioritizing professional staff development and receiving support from the

deanship, the incorporation of deep learning-based instructions will contribute to students' growth in critical reading skills and self-regulation.

Discussion

The findings of this study emphasize the crucial role of teaching critical reading strategies, demonstrating that formal deep learning-based instruction effectively enhances learners' critical reading skills. This improvement is attributed to the structured tasks and goal-setting strategies that promote self-regulated learning (SRL). The results align with previous research, such as Parson's (2002) work on metacognitive strategies, which found that such strategies enhance reading comprehension and critical thinking. Similarly, the experimental group in this study, who received deep learning instruction, outperformed their peers taught through traditional methods.

Further supporting this, Chen and Dhillon (2012) noted that deep learning strategies significantly improve reading skills, particularly using Briggs's (2003) 3P model. Hermida (2009) found that first-year students shifted from surface learning to more critical evaluation after instruction in deep learning strategies. This shift indicates that interactive, student-centered activities can transform learners into more proficient readers.

Statistical data from pre- and post-assessments revealed a direct correlation between critical reading strategies and deep learning instruction, with the experimental group performing better than the control group. Prior studies by Heikkilä and Lonka (2006) and others have also shown a strong link between SRL and a deep learning approach. Heikkilä and Lonka found that expectations of success are positively correlated with SRL, while Vermunt (1998) concluded that deep-processing strategies depend on self-regulation. Lonka and Lindblom-Ylänne (1996) reinforced that a deep learning approach influences students' self-regulation and goal orientation.

Overall, self-regulated learning, deep understanding, and critical evaluation are interconnected, contributing to academic success (Heikkilä et al., 2011). Research shows that a deep learning approach correlates with better outcomes, while a surface approach is linked to poorer performance (Entwistle et al., 2001). This study reinforces the importance of integrating deep learning strategies to enhance critical reading and self-regulation.

In educational psychology, there's a consensus that effective learners employ cognitive strategies, such as rehearing, elaborating, and organizing, to enhance comprehension (Pintrich & De Groot, 1990). These strategies lead to improved academic performance. High-achieving students tend to use a broader array of cognitive strategies than low-achieving peers (Cleary et al., 2000), highlighting the role of critical thinking in transforming metacognitive abilities into tangible outcomes. Fabriz et al. (2014) identified SRL as vital for university students, advocating for increased awareness of its benefits. Al-Jarrah (2010) found significant differences in academic achievement between students with varying levels of SRL, with higher levels correlating with better goal setting and planning.

In summary, the current study aligns with existing research, indicating that combining self-regulation, goal-setting, and deep learning strategies leads to higher critical reading scores in

the experimental group. The data suggest that deep learning-based instruction effectively develops critical reading skills and self-regulation, underscoring its substantial impact on student learning outcomes.

Summary, Recommendations, and Suggestions

Summary

This study utilized a mixed-methods approach, collecting both quantitative data through critical reading tests and questionnaires, and qualitative data via classroom observations. A pretest-posttest design was implemented for both experimental and control groups. The control group received standard instruction, while the experimental group was taught additional deep learning-based activities by the researcher.

The study aimed to address four questions regarding the effects of deep learning on critical reading skills, self-regulation, attitudes towards reading, and integration into classes. Findings indicated that deep learning-based instruction significantly improved participants' critical reading skills and self-regulation, with the experimental group outperforming the control group. The control group's lack of exposure to these strategies resulted in no significant improvement. Overall, the study suggests that deep learning can effectively enhance critical reading skills and self-regulation in freshman female EFL learners, highlighting the importance of integrating such strategies into reading classes for better academic performance.

Recommendations

This study has significant theoretical and pedagogical implications for educators, highlighting the need to incorporate deep learning-based instruction into the curriculum. It shows that such instruction enables students to activate prior knowledge, make connections, infer meaning, and critically evaluate texts, fostering self-regulated learning.

From a pedagogical standpoint, the study recommends that EFL teachers adopt strategies that enhance deep reading comprehension, making learning more engaging and authentic. It also emphasizes the importance of formative assessments to address abstract knowledge difficulties. Additionally, syllabus designers should create materials that promote active participation through both deep and surface learning approaches. By embracing deep learning, teachers can better meet learners' needs, enhancing critical reading skills applicable across disciplines and transforming their role into facilitators of learning.

Suggestions for Further Research

First: Expand the sample size beyond the small, homogeneous group of female students from IMSU to include participants from different universities and diverse socioeconomic backgrounds for varied findings.

Second: Consider the influence of demographic, cultural, and environmental factors on deep learning-based instruction's impact on critical reading and self-regulation in future research.

Third: Implement deep learning-based instruction as a standalone curriculum, separate from the existing curriculum, due to the limited course duration.

Fourth: Conduct classroom observations in face-to-face settings on campus for more reliable qualitative data, as virtual observations were conducted due to COVID-19.

Fifth: Use an integrated and contextualized approach to investigate predictors of academic achievement related to deep learning and self-regulated learning (SRL).

Sixth: Further investigate self-regulation and self-motivation in EFL learners, in addition to the study's exploration of deep learning and self-regulation.

Seventh: Explore how teachers assess and evaluate deep learning-based instruction in EFL classrooms to gain insights from educators' perspectives.

Bio

Khalid Mohammed Alwahibee is a professor of Curriculum and Instruction with interest in TESOL and Applied Linguistics, department of English Language and Literature, College of English Language and Translation, Imam Mohammed bin Saud Islamic University.
alwahibee@hotmail.com

Muneera Falah Alotaibi is a post graduate student in Applied Linguistics at the department of English Language and literature, College of English Language and Translation, Imam Mohammed bin Saud Islamic University.
Muneerafalah86@gmail.com

References

Abd Kadir, N., Subki, R., Jamal, F., & Ismail, J. (2014). *The importance of teaching critical reading skills in a Malaysian reading classroom*. West East Institute.

Ahmad, I. I. (2007). Self-regulation of learning and self-motivation and their relationship with the academic achievement of the students of the College of Education (Predictive study). *Journal of the College of Education, EinShams University*, *31*(3), 69–135.

Al-jarrah, A. (2010). The relationship between self-regulated learning and academic achievement among sample of Yarmouk University students. *The Jordanian Journal of Educational Sciences*, *6*(4), 333–348.

Al-Otaibi, S. M. (2013). Investigating Saudi EFL learners' vision of future-self and its relationship to their self-regulated learning behaviour. *Arab World English Journal for Translation & Literary Studies*, *4*(4), 112–127.

Anderson, R. C., Hiebert, E. H., Scott, J. H., & Willkinson, I. A. G. (1985). *Becoming a nation of readers: The report of the commission on reading*. University of Illinois.

Biggs, J. (1993). What do inventories of students' learning processes really measure? A theoretical review and clarification. *British Journal of Educational Psychology*, *63*(1), 3–19.

Biggs, J. (2003). Aligning teaching and assessing to course objectives. Teaching and learning in *Higher education: New trends and innovations*, *2*(April), 13–17.

Borredon, L., Deffayet, S., Baker, A. C., & Kolb, D. (2011). Enhancing deep learning: Lessons from the introduction of learning teams in management education in France. *Journal of Management Education*, *35*(3), 324–350.

Briggs, A. R. J. (2003). The 3P model of learning: A framework for understanding and improving student learning. *Assessment & Evaluation in Higher Education*, *28*(1), 33-44. https://doi.org/10.1080/0260293032000052276

Brown, H. D., Hudson, T., Coombe, C., & Lado, W. (1999). *Language assessment: Principles and classroom practices*. Longman.

Butler, D. (2002). Individualizing instruction in self-regulated learning. *Theory into Practice*, *41*, 81–92.

Cameron, S. (2008). *The MBA handbook: Skills for mastering management*. Pearson Education.

Cepeda, N. J., Pashler, H., Vul, E., Wixted, J. T., & Rohrer, D. (2006). Distributed practice in verbal recall tasks: A review and quantitative synthesis. *Psychol Bull*., *132*(3), 354–380.

Chen, L., & Dhillon, J. K. (2012). Deep approaches to learning in improving reading skills: A case study from Yunnan Agricultural University. *Theory and Practice in Language Studies*, *2*(8). https://doi.org/10.4304/tpls.2.8.1603-1613

Chin, C., & Brown, D. E. (2000). Learning in science: A comparison of deep and surface approaches. *Journal of Research in Science Teaching*, *37*(2), 109–138. https://doi.org/10.1002/(SICI)1098-2736

Cleary, T. J., Zimmerman, B. J., & Schunk, D. H. (2000). Self-regulation and academic achievement: The role of goal setting. *Journal of Educational Psychology*, *92*(3), 559-570. https://doi.org/10.1037/0022-0663.92.3.559

Cohen, M. (2012). The importance of self-regulation for college student learning. *Free Patents Online*. http://www.freepatentsonline.com/article/College-Student-Journal/312618227.html

Critical reading strategies. (2009). Salisbury University. http://www.salisbury.edu

Dede, C. (2014). The role of digital technologies in deeper learning. *Jobs for the future*. Harvard University.

Dieterle, E. (2009). Neomillennial learning styles and River City. *Children, Youth, and Environments*, *19*(1).

Duncan, S. (2014). Critical reading in higher education: A new perspective. *Journal of College Literacy and Learning*, *40*, 25-34.

Durkin, D. (1993). *Teaching them to read*. Boston: Allyn and Bacon.

Fabriz, S., Pritchard, A., & Boulton, H. (2014). The role of self-regulated learning in academic success: A study of university students. *International Journal of Educational Research*, *67*, 54-65. https://doi.org/10.1016/j.ijer.2014.05.002325–345

Fink, L. D. (2003a). *A self-directed guide to designing courses for significant learning*. University of Oklahoma, *27*(11).

Foorman, B. R., & Torgesen, J. (2001). Critical elements of classroom and small group instruction to promote reading success in all children. In *Learning disabilities research & practice*. Blackwell Synergy.

Ghasemi, A. A., & Dowlatabadi, H. R. (2018). Investigating the role of task value, surface/deep learning strategies, and higher order thinking in predicting self-regulation and language achievement. *The Journal of AsiaTEFL*, *15*(3), 664–681. https://doi.org/10.18823/asiatefl.2018.15.3.664

Grabe, W. (1988). Reassessing the term "interactive." *Interactive Approaches to Second Language Reading*, *6*, 56-70.

Hall, M., Ramsay, A., &., Ravens, J. (2004). Changing the learning environment to promote deep learning approaches to first-year accounting students. *Accounting Education*, *13*(4), 489–505.

Halpern, D. F. (2003). *Thought & knowledge: An introduction to critical thinking*. Lawrence Erlbaum Associates.

Hật, N. T., & Le, T. H. (2023). The impact of reflective writing on student performance: Enhancing content retention and higher-order thinking. *International Journal of Educational Research*, *123*, 102-115. https://doi.org/10.1016/j.ijer.2023.102115

Hattie, J., & Donoghue, G. (2016). Learning strategies: A synthesis and conceptual model. *Npj Science of Learning*, *1*, 1–13.

Heikkilä, A., & Lonka, K. (2006). Studying in higher education: Students' approaches to learning, self-regulation, and cognitive strategies. *Studies in Higher Education*, *31*(1), 99–117. https://doi.org/10.1080/03075070500392433

Hermida, D. (2009). The importance of teaching academic reading skills in first-year university courses. *The International Journal of Research and Review*, *3*(1), 20–30.

Hermida, J. (2016). Strategies to promote a deep approach to reading. *College Quarterly*, *19*(1), 1-13.

Jenson, J. (2011). Promoting self-regulation and critical reflection through writing students' use of electronic Portfolio. *International Journal of ePortfolio*, *1*(1), 49–60.

Junaštíková, J. (2024). Self-regulation of learning in the context of modern technology: A review of empirical studies. *Interactive Technology and Smart Education*, *25*(2). https://doi.org/10.1108/ITSE-08-2023-0145

Kitsantas, A. (2002). Test preparation and performance: A self-regulatory analysis. *The Journal of Experimental Education*, *70*, 101–113.

Ko, M. Y. (2013). A case study of an EFL teacher's critical literacy teaching in reading class in Taiwan. *Language Teaching Research*, *17*(1), 91–108.

Kurland, D. (2004). *How the language really works: The fundamentals of critical reading and effective writing*. http://www.criticalreading.com/index.html

Le, H. V., Nguyen, T. A. D., Le, D. H. N., Nguyen, P. U., & Nguyen, T. T. A. (2024). Unveiling critical reading strategies and challenges: A mixed-methods study among English major students in a Vietnamese higher education institution. *International Journal of Educational Research Open*, 2326732. https://doi.org/10.1080/2331186X.2024.2326732

Lonka, K., & Lindblom-Ylänne, S. (1996). Epistemologies, conceptions of learning, and study practices in medicine and psychology. *Higher Education*, *31,* 5–24.

Macknish, C. J. (2011). Understanding critical reading in an ESL class in Singapore. *TESOL Journal*, *2*(4), 444–472.

Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I-outcome and process. *British Journal of Educational Psychology*, *46*(1), 4–11. https://doi.org/10.1111/j.2044-8279.1976.tb02980.x

McKay, J., & Kember, D. (1997). Spoon feeding leads to regurgitation: A better diet can result in more digestible learning outcomes. *Higher Education Research and Development*, *6*(1), 55–67. https://doi.org/10.1080/0729436970160105

Millis, B. J. (2010). Promoting deep learning (IDEA Paper No. 47). *The IDEA Center*. http://sph.bu.edu/otlt/teachingLibrary/Learning%20Theory/Deep-learning.pdf

Muhammad, A. S., & Abu Bakar, N. (2015, September 6–7). Relationship of self-regulated learning and academic achievement among Universiti Sultan Zainalabidin (UNISZA) undergraduate students. *International Conference on Empowering Islamic Civilization in the 21st Century*, Universiti Sultan ZainalAbidin, Malaysia.

Naseri, S., & Motallebzadeh, K. (2016). Podcasts: A factor to improve Iranian EFL learners' self-regulation and use of technology. *Educational Technology*, *19*(2), 328–339.

Nasrollahi, M., Krishnasamy, P., & Noor, N. (2009). Process of implementing critical reading strategies in an Iranian EFL classroom: An action research. *International Education Studies*, *8*(1), 9–16.

Offir, B., Lev., Y., & Bezlel, R. (2008). Surface and deep learning processes in distance education: Synchronous versus asynchronous systems. *Computers & Educational*, *51*, 1172–1183.

Paris, S., & Paris, A. (2001). Classroom applications of research on self-regulated learning. *Educational Psychology*, *36*, 89–101.

Park, Y. (2011). Using new articles to build a critical literacy classroom in an EFL setting. *TESOL Journal*, *2*(1), 24–51.

Parson, J. (2002). Critical reading: Can it be improved through the use of metacognitive strategies? *American Reading Forum*. http://www.americanreadingforum.org/Yearbooks/ 85_yearbook/pdf/39_Parson.pdf

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning in the college classroom. *Journal of Educational Psychology*, *82*(1), 33-40. https://doi.org/10.1037/0022-0663.82.1.33

Pretorius, E. (2010). The importance of reading: A guide to learning English. http://esl.fis.edu/parents/advice/read.htm

Rhem, J. (1995). Close-up: Going deep. *The National Teaching & Learning Forum*, *5*(1), 4.

Salisbury University. (2009). Critical reading strategies. http://www.salisbury.edu

Snow, C. E. (2001). Reading for understanding. *RAND Education & the Science and Technology Policy Institute.*

Sun, L. (2014). Teacher's role in promoting students' self-regulated learning. https://wiki.oulu.fi/download/.../research+plan(Liping).pdf?version

Sun, L., Wang, J., Gong, D., & Jiang, N. (2022). The effectiveness of implementing deep learning activities in a blended learning perspective based on big data analysis. Harbin Huade University Academy of Data Science and Artificial Intelligence, China.

Tochon, F. (2013). Effectiveness of deep, blended language learning as measured by oral proficiency and course evaluation. *Journal of the National Council of Less Taught Languages*, *14*, 51–86.

Veeman, M. V. J., Prins, F. J., & Verheij, J. (2003). Learning styles: Self-reports versus thinking-aloud measures. *British Journal of Educational Psychology*, *73*, 357–372. https://doi.org/10.1348/000709903322275885

Vermunt, J. D. (1998). The regulation of constructive learning processes. *British Journal of Educational Psychology*, *68*, 149–171.

Wallace, C. (2003). *Critical reading in language education*. Palgrave Macmillan.

Wang, J. (2013). *The effects of deep approaches to learning on students' need for cognition over four years of college* [Doctoral dissertation, Iowa University].

Wang, M. T., & Sperling, R. (2020). The role of self-regulation in academic success: A meta-analysis. *Educational Psychology Review*, *32*(3), 607-635. https://doi.org/10.1007/s10648-020-09562-4

Wong, B. (2016). *Using critical-thinking strategies to develop academic reading skills among Saudi IEP students* [Doctoral dissertation, School of Education].

Yildirim, S., & Söylemez, Y. (2018). The effect of performing reading activities with critical reading questions on critical thinking and reading skills. *Asian Journal of Education and Training*, *4*(4), 326–335.

Yu, J. (2015). Analysis of critical reading strategies and its effect on college English reading. *Theory and Practice in Language Studies*, *5*(1), 134–138.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, *81*(3), 329-339. https://doi.org/10.1037/0022-0663.81.3.329

Zimmerman, B., Bonner, S., & Kovach, R. (2002). Developing self-regulated learners: Beyond achievement to self-efficacy. *American Psychological Association*.

Zimmerman, B. J. (1998a). Academic studying and the development of personal skill: A self-regulatory perspective. *Educ Psychol.*, *33*, 73–86.

Zimmerman, B. J. (1998b). Developing self-fulfilling cycles of academic self-regulation: An analysis of exemplary instructional models. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulated learning: From teaching to self-reflective practice* (pp. 1–19). Guildford.

Zimmerman, B. J. (2000a). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press.

Table 7

Arrangement of Statements in the CRQ Based on Student's Responses

Statements
4. I can distinguish the information that does not agree with mine.
33. I always revise to detect the mistakes I may make when I assess a text.
29. I can share what I have learned from the text.
12. I can associate the images with the text.
28. I can decide the type of information relevant to application in my life.
11. I can relate the images and the topic of the text.
6. I can identify the specific concepts in the text and which of them were sufficiently explained.
16. I can detect if the text is based on truth or fiction.
1. I am aware of the significance of the text I read.
8. I can distinguish the main theme and secondary themes of the text.
3. I can identify what I should research about in the text and what parts of it I have information about.
23. I can state my predictions regarding the text.
18. I can determine author's main argument in the text.
17. I can validate the results, solution, and recommendations given in the text.
10. I can decide on the type of relationship that I have found in the text and whether it has been established correctly.
26. I'm able to detect if the information in the text is reliable, current, and valid.
25. I'm aware of the clear, consistent, logical or unethical information that I have found in the text and the reasons for providing it.
7. I can name the problem or the phenomenon in the text and how successfully the author explained it.
9. I can relate the main theme and secondary themes.
15. I can decide whether the ideas given in the text are convincing.
5. I can specify the information that I need to verify by referring to information sources.
31. I try to avoid the interference of my prejudices and prior knowledge on my assessments regarding the text.
21. I'm able to detect any inconsistency in the text.
24. I can detect the results I come up with based on the information provided by the text.
13. I'm able to detect the text containing overt/covert commercial/propaganda.
19. I'm able to detect the purpose of the author.
32. I know how to evaluate the text objectively.
20. I'm able to detect how the formal logic of the text has been formed.
2. I can read the text critically, and I feel ready to handle it.
14. I can detect the kind of pattern of classifying the information given in the text according to the degree of importance.
30. I ask for help when I feel I am unsure of the assessment I've made about the text.

27. I can deduce the author's beliefs and prejudices from the text.
22. If the text contains a logical fallacy, I'm able to detect how it affects the general structure and hence the conclusion.

Appendix B

Table 8

Researchers'' Observation Tool for Assessing Student Engagement and Self-Regulated Learning Experimental group

Categories	V. High	High	Neutral	Low	V. Low
First: Students Engagement:					
- Level of engagement in assigned tasks.	✓				
- Participation in discussions and activities.		✓			
- Time on task and focus during instruction.		✓			
Second: Awareness of Cognitive and Metacognitive Processes:					
- Verbalization of thought processes.		✓			
- Monitoring of comprehension and progress.		✓			
- Use of learning strategies and techniques.		✓			
Third: Application of Critical Reading skills:					
- Identification of main ideas and supporting details.		✓			
- Analysis and evaluation of text.		✓			
- Drawing inferences and making connections.	✓				
Fourth: Self-Regulated Learning (SRL) Behaviors:					
- Self-initiation of learning activities.	✓				
- Use of goal setting and planning.		✓			
- Self-monitoring and self-evaluation.		✓			
- Adaptability and flexibility in learning approaches.		✓			

Table 9

Researchers' Observation Tool for Assessing Student Engagement and Self-Regulated Learning Experimental group

Categories	V. High	High	Neutral	Low	V. Low
First: Students Engagement:					
- Level of engagement in assigned tasks.				✓	
- Participation in discussions and activities.				✓	
- Time on task and focus during instruction.					✓
Second: Awareness of Cognitive and Metacognitive Processes:					
- Verbalization of thought processes.					✓
- Monitoring of comprehension and progress.					
- Use of learning strategies and techniques.				✓	
Third: Application of Critical Reading skills:					
- Identification of main ideas and supporting details.			✓		
- Analysis and evaluation of text.				✓	
- Drawing inferences and making connections.					✓
Fourth: Self-Regulated Learning (SRL) Behaviors:					
- Self-initiation of learning activities.			✓		
- Use of goal-setting and planning.				✓	
- Self-monitoring and self-evaluation.					✓
- Adaptability and flexibility in learning approaches.				✓	