Examining the Impact of Explicit Cognitive Reading Strategy Instruction on EFL Learners' Motivation and Self-Efficacy: A Quasi-Experimental Approach

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Abstract

This study investigated the effects of explicit cognitive reading strategy instruction on Jordanian EFL undergraduates' intrinsic motivation, extrinsic motivation, and self-efficacy in academic reading, as well as the relationships among these variables following the same explicit reading instructional approach. Adopting a quasi-experimental pre-test–post-test design, 90 undergraduate EFL students were assigned to an experimental group receiving explicit instruction in cognitive reading strategies and a control group receiving conventional reading instruction. Data were collected using a validated questionnaire measuring intrinsic motivation, extrinsic motivation, and self-efficacy. Data were analysed using analysis of covariance (ANCOVA) and Pearson product–moment correlation. The results revealed statistically significant effects of the intervention on all three outcome variables. After controlling for pre-test scores, the experimental group demonstrated significantly higher levels of intrinsic motivation, extrinsic motivation, and self-efficacy than the control group, with large effect sizes. In addition, correlation analysis indicated strong positive relationships among intrinsic motivation, extrinsic motivation, and self-efficacy at the post-test stage. Specifically, both intrinsic and extrinsic motivation were strongly associated with students' self-efficacy in academic reading. These findings suggest that explicit cognitive reading strategy instruction not only enhances EFL learners' motivational orientations but also strengthens their confidence in managing academic reading tasks. The study highlights the value of integrating explicit cognitive strategy instruction into EFL reading courses to support both motivational and self-belief dimensions of reading development.

Keywords: cognitive strategies, explicit instruction, intrinsic motivation, extrinsic motivation, self-efficacy

1. Introduction

1.1 Motivation and Cognitive Reading Strategy Instruction

Motivation has long been recognized as a central factor in learning, particularly in educational contexts that require learners to sustain effort and actively engage with second language (L2) materials. As learning a foreign language has become increasingly necessary, learners differ in their motivation to undertake this challenge (Liu et al., 2025; Ma & Zhao, 2025). In L2 learning, motivation therefore plays a crucial role, as learners must continuously invest cognitive, emotional, and behavioural resources over extended periods of time (Dörnyei, 2014; Ryan & Deci, 2000). Research has pointed out that motivated learners are more likely to persist in challenging tasks, regulate their learning effectively, and achieve better academic success and learning achievement (Schunk et al., 2014; Ushioda, 2020). However, differences among learners in terms of the type and intensity of motivation should be taken into consideration as these differences are shaped and influenced by various contextual factors such as the instructional practices applied by teachers, learning environment themselves, and sociocultural contexts (Dörnyei & Ushioda, 2021; Teimouri et al., 2022). Having this in mind, teachers and educators in L2 contexts, including EFL ones, should have awareness of the important role of classroom instruction as it can have effects on learners' motivation. Within this broader discussion of L2 motivation, classroom instruction—particularly in academic reading—has been discussed as an important context for understanding how learners' motivational orientations develop.

Despite the presence of extensive body of research on motivation in L2 contexts, sufficient attention has not been given to how specific instructional approaches can shape and affect EFL leaners' motivational orientations in academic reading contexts. Cognitive reading strategies—such as elaboration, inference, prediction, and paraphrasing—are well established as effective tools for supporting reading comprehension and development of proper academic literacy (Chamot, 2004; Grabe & Stoller, 2019). The application of cognitive

strategies, including previewing texts, monitoring comprehension, and inferential reasoning, enhances the richness and dynamism of reading (Khoiri & Harsiati, 2025). Furthermore, it has been argued that reading comprehension relies on cognitive strategies that enable readers to interpret meaning and construct knowledge from written texts (Suyitno, 2017). These strategies are intentional, conscious mental processes that support problem-solving and task completion. Many learners experience difficulties with reading comprehension, often associated with inadequate instruction and low motivation. Equipping students with appropriate reading strategies may help address these challenges by supporting comprehension, self-regulation, and motivation (Kavani & Amjadiparvar, 2018). In reading, learners should actively use these strategies for deeper understanding and more accurate interpretation of texts (Abdulqadir et al., 2025). In EFL context, one of the concerns in the current studies that have focused on the development of reading performance is that they treated motivation as a stable learner characteristic rather than as a learning-related outcome of explicit instruction (Indrayadi, 2021; Ma & Zhao, 2025). Similarly, although previous studies have reported the presence of strong link between motivation and self-efficacy in language learning, fewer studies have examined how these constructs interact within the context of explicit cognitive reading strategy instruction. In EFL contexts, this gap is evident in higher education EFL settings, including the Jordanian universities, where undergraduate learners frequently encounter challenges in academic reading (Al-Jarrah & Ismail, 2018; Albashtawi et al., 2016; Qrqez & Ab Rashid, 2017). Suyitno (2017) recommended that researchers can focus on the effect of cognitive strategies on reading comprehension, but they are recommended to "use different types of reading texts, such as narrative texts" (p. 119).

Taking into account the gaps in previous studies and the academic reading difficulties encountered by Jordanian EFL university students, the present study examines the effect of explicit cognitive strategy instruction on the Jordanian undergraduate EFL leaners' intrinsic and extrinsic motivation and explores the association between intrinsic motivation and self-efficacy following the intervention. It is worth mentioning that the association between extrinsic motivation and self-efficacy was not examined because the study was theoretically oriented toward internally regulated constructs. Self-efficacy is more conceptually aligned with intrinsic motivation, as both are grounded in learners' internal beliefs. In contrast, extrinsic motivation reflects externally driven regulation, which works through different psychological mechanisms and is often less in predicting self-beliefs. Drawing on self-regulation perspectives (Schunk & DiBenedetto, 2020; Zimmerman, 2000), this study positions motivation and self-efficacy as learning-related outcomes of strategy-based instruction rather than constructs that are explicitly taught or directly targeted during the intervention. Using a quasi-experimental design, this study aims to present some empirical evidence on how explicit strategy instruction in academic reading can support learners' motivation and self-regulated learning in higher education.

1.2 Intrinsic and Extrinsic Motivation

Motivation is widely recognized as a key factor influencing success in L2 learning. It also affects learners' engagement with learning tasks, their persistence when difficulties arise, and their overall learning outcomes. Contemporary research conceptualises motivation as a dynamic construct that develops through learners' interactions with instructional tasks, learning environments, and social contexts, rather than as a stable personal trait (Dörnyei, 2014; Dörnyei & Ushioda, 2021). As a result of this conceptualisation, changes are commonly associated with changes in learning performance, particularly in academically demanding contexts such as academic reading. A commonly adopted distinction in motivational research is between intrinsic and extrinsic types of motivation. Intrinsic motivation refers to engagement driven by interest, enjoyment, or personal value, whereas extrinsic motivation involves participation motivated by external outcomes such as grades, assessments, or future academic and professional goals (Ryan & Deci, 2000). Empirical studies suggest that intrinsic motivation is associated with deeper cognitive engagement and sustained learning efforts, while extrinsic motivation plays an important role in initiating engagement in formal educational settings (Schunk et al., 2014). Motivated readers tend to engage more deeply with texts, persist in challenging reading tasks, and apply effective strategies to improve comprehension (Cremin, 2023; Guthrie & Davis, 2003), while extrinsic motivation refers to the external rewards and benefits students receive for their efforts (Pintrich & Schunk, 2002). In EFL contexts, learners typically rely on both forms of motivation, particularly where reading tasks are linked to assessment requirements. Accordingly, recent research has highlighted the essential role of classroom practices, task design, and perceived learner control in shaping motivation over an extended period of time (Dörnyei & Ushioda, 2021). This shift suggests that instructional approach applied by teachers, including strategy-based instruction, may play an important role in supporting both intrinsic and extrinsic motivation in academic reading contexts.

1.3 Motivation, and Self-Efficacy

Learners with higher self-efficacy are more likely to invest effort, persist when faced with difficulty, and use learning strategies effectively. In contrast, low self-efficacy is often associated with avoidance behaviours and reduced engagement (Schunk, 1995). Research consistently shows that instructional practices that support successful strategy use can contribute to the development of stronger self-efficacy beliefs. The relationship among learning strategies, motivation, and self-efficacy is well established within self-regulated learning theory. Learners who actively monitor and regulate their learning tend to demonstrate higher motivation and greater confidence in their abilities (Chamot & O'malley, 1994). As learners experience success through strategy use, self-efficacy increases, which in turn supports continued engagement. This reciprocal relationship provides a theoretical basis for examining the motivational and self-efficacy outcomes of explicit cognitive reading strategy instruction in EFL contexts.

Learning strategies are fundamental to understanding the ways in which L2 learners engage with and manage academic learning tasks. This is because they support comprehension, organization of information, and regulation of learning processes (Paris & Winograd, 1990; Shafiee Rad, 2025). When learners are equipped with appropriate strategies, learning tasks become more manageable, which can increase

engagement and persistence. From this perspective, strategy use is closely linked to motivational processes and learning outcomes. A key construct connecting motivation and strategy use is self-efficacy, which is defines as learners' beliefs about their ability to perform specific tasks successfully (Bandura, 1986). Given this, learners with higher self-efficacy are more likely to invest efforts, persist when faced with learning difficulties, and use learning strategies effectively because self-efficacy shapes how learners think, feel, and act during learning (Schunk & DiBenedetto, 2020). In contrast, low self-efficacy use often associated with avoidance behaviours and reduced engagement (Schunk, 1995). Research consistently shows that instructional practices that support successful strategy use can contribute to the development of stronger self-efficacy beliefs. The relationship among learning strategies, motivation, and self-efficacy is well-established within self-regulated learning theory. Learners who actively monitor and regulate their learning tend to demonstrate higher motivation and greater confidence in their abilities (Zimmerman & Schunk, 2011). As learners experience success through strategy use, self-efficacy increases. This, in turn, supports continued engagement with learning tasks. This reciprocal relationship provides a theoretical basis for examining the motivational and self-efficacy outcomes of explicit cognitive reading strategy instruction in EFL contexts.

1.4 Related Studies

A growing body of research has examined the effects of cognitive strategy instruction on reading comprehension and affective learner variables such as motivation and self-efficacy. Some of these studies have reported that strategy-based instruction enhances reading comprehension while also supporting motivation and self-educated learning (Kavani & Amjadiparvar, 2018). Other research has demonstrated significant gains in reading self-efficacy following explicit strategy instruction across different EFL contexts, including university-level learners and younger students (Fathi & Soleimani, 2020; Valizadeh, 2021). However, findings related to motivation are less consistent. While self-efficacy often shows improvement following strategy instruction, motivation frequently demonstrates weaker or non-significant changes, particularly in short-term interventions (Fathi & Soleimani, 2020; Li et al., 2022). This can suggest that affective constructs, such as motivation and self-efficacy, may require sustained instructional exposure to develop meaningfully. Evidence from longer-term and socially supported instructional models, such as strategy instructions combined with peer tutoring, indicates that more durable self-efficacy gains are possible, particularly among adult learners (Van Keer & Verhaeghe, 2005). Further research focusing specifically on reading strategies—such as note-taking and highlighting—has been shown to improve reading comprehension (Ramezani, 2018), while mobile-assisted strategy instruction supports reading development in online and blended-learning environments (Alzubi, 2024). At discourse level, cognitively demanding instructional models have been shown to enhance learners' overall cognitive engagement with texts, although effects on specific strategy components are less consistent (Abdulqadir et al., 2025). Larger-scale survey studies further indicate disciplinary variation in strategy use and awareness across higher education contexts (Garc á-S ánchez & Garc á-Mart ń, 2021).

Overall, existing research suggests that explicit reading strategy instruction can improve EFL learners' reading comprehension and may also support learner outcomes such as motivation, self-regulated learning, and self-efficacy (e.g., Fathi & Soleimani, 2020; Kavani & Amjadiparvar, 2018; Li et al., 2022; Valizadeh, 2021; Van Keer & Verhaeghe, 2005). At the same time, the literature leaves some issues unresolved. For example, motivation is often treated as a single, global construct, affective variables such as self-efficacy are frequently examined in isolation, and some strategy-focused studies prioritise performance outcomes without systematically modelling motivational change (e.g., Abdulqadir et al., 2025; Alzubi, 2024; Garc á-S ánchez & Garc á-Mart ń, 2021; Ramezani, 2018; Suyitno, 2017). As a result, we still know relatively little about whether explicit cognitive strategy instruction can influence intrinsic and extrinsic motivation as distinct outcomes, or how intrinsic motivation relates to self-efficacy after strategy instruction—particularly in higher-education EFL contexts in the Arab EFL contexts. The present study addresses this gap by examining the effects of explicit cognitive strategy instruction in academic reading on Jordanian undergraduates' intrinsic and extrinsic motivation, and by exploring the post-intervention association between intrinsic motivation and reading self-efficacy from a self-regulation perspective. Grounded in self-regulation perspectives, the study conceptualises motivation and self-efficacy as learning-related outcomes that may develop through learners' engagement with strategy-based instruction rather than as direct targets of training. Accordingly, the study addresses the following four research questions:

1. How does explicit cognitive reading strategy instruction affect Jordanian EFL undergraduates' intrinsic motivation?
2. How does explicit cognitive reading strategy instruction affect Jordanian EFL undergraduates' extrinsic motivation?
3. How does explicit cognitive reading strategy instruction affect Jordanian EFL undergraduates' self-efficacy?
4. What is the correlation between intrinsic motivation and reading self-efficacy following the instructional intervention?

As this study focuses on a higher education EFL context in Jordan, it contributes empirical evidence from an underrepresented setting and helps clarify how explicit cognitive reading strategy instruction shapes learners' motivation and self-efficacy in academic reading. It also highlights how teaching students how to read strategically can influence their engagement with reading materials and confidence.

2. Method

2.1 Research Design

This study employed a quasi-experimental pre-test–post-tests control group design to examine the effects of explicit cognitive reading strategy instruction on learners' intrinsic and extrinsic motivation, as well as the association between intrinsic motivation and reading self-efficacy following the intervention program that lasted for 10 weeks. A quasi-experimental design was considered appropriate

because random assignment is often not feasible in classroom-based research, and such designs are commonly used in applied linguistics and educational studies to investigate instructional interventions in authentic learning contexts (Creswell & Creswell, 2017; Mackey & Gass, 2015). The use of pre- and post-intervention measures helped the researchers to examine changes in students' motivation and self-efficacy over time. It also supported the interpretation of observed differences as intervention-related rather than attributable to natural development or testing effects (Shadish et al., 2002). The inclusion of the control group that followed regular reading instruction provided an appropriate reference point for evaluating the effects of the instructional treatment while maintaining ecological validity within the higher education classroom setting (Mackey & Gass, 2015).

2.2 Context and Participants

The study involved 90 undergraduate EFL students enrolled in a mandatory English Language Skills course at the Department of English in a private university college in Jordan. The participants were drawn from a larger population of approximately 133 students registered in the course and ranged in age from 19 to 24 years. A one-stage cluster sampling procedure was used, whereby intact class sections served as the sampling units; from the three available course sections, two clusters were randomly selected using simple random sampling, an approach commonly adopted in educational research when individual random assignment is not feasible and intact classes must be maintained (Levy & Lemeshow, 2013). All participants shared a comparable linguistic and educational background, as they were native Arabic speakers who had completed 12 years of formal EFL instruction prior to entering higher education. The sample consisted of 90 undergraduate students and was predominantly female, with 79 females (87.8%) and 11 males (12.2%), reflecting the typical gender distribution of the programme. Participants were evenly distributed across the two instructional conditions, with 45 students (50.0%) assigned to the experimental group and 45 students (50.0%) to the control group, supporting the comparability of the groups.

2.3 Data Collection

Data were collected using a questionnaire adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich (1991). The MSLQ is a well-established instrument grounded in social-cognitive and self-regulated learning theory and has been widely used to examine learners' motivational orientations and self-beliefs in academic contexts (Pintrich & De Groot, 1990). The questionnaire assessed students' motivational orientations and confidence beliefs in relation to academic reading and vocabulary learning in the Advanced Reading course. It comprised three dimensions: intrinsic goal orientation, extrinsic goal orientation, and self-efficacy for learning and performance. Intrinsic goal orientation items focused on students' interest in challenging and curiosity-arousing texts and their satisfaction with deep comprehension and learning. Extrinsic goal orientation items measured motivation driven by external outcomes, such as grades, performance, and social recognition. Self-efficacy items assessed students' confidence in their ability to understand course content, apply learning strategies, and perform successfully in reading- and vocabulary-related tasks (see Appendix A).

Content validity was established through expert review by a panel of five specialists from two academic departments across two universities, who confirmed the relevance, clarity, and alignment of the items with the study's research questions. The questionnaire demonstrated satisfactory internal consistency, with reliability coefficients ranging from .79 to .90 for the subscales and .68 for the overall scale. Responses were recorded on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument was administered to both the experimental and control groups at two time points, before and after the intervention. Ethical considerations were observed throughout the study, and approval to conduct the research was obtained from the relevant academic authorities in the context of the study. Participation was voluntary, and all students provided informed consent after being informed of the study's purpose, procedures, and their right to withdraw without penalty. Anonymity and confidentiality were ensured by coding all data and using the responses exclusively for research purposes. The intervention posed no risk to participants, as both groups followed regular course requirements, with the experimental group receiving additional instructional support.

2.4 Intervention Program

The intervention program was grounded in the view that language learning is a complex and gradual cognitive process that develops over time through sustained engagement, guided practice, and meaningful feedback. In line with this perspective, the program was designed to support students' engagement with academic reading texts at the tertiary level by explicitly integrating cognitive reading strategies (Chamot, 2005; Li et al., 2022; Yapp et al., 2023) alongside key motivational constructs drawn from self-regulation and social cognitive theories. Rather than treating motivation as a direct instructional target, the program aimed to create learning conditions in which intrinsic motivation, extrinsic motivation, and self-efficacy could develop as outcomes of successful strategy use and increased control over reading tasks. The intervention was implemented over a ten-week period. During this time, academic reading materials covering a range of topics relevant to students' disciplinary and general academic interests were carefully selected. Detailed lesson plans were prepared in advance, specifying the reading texts, the cognitive strategies to be introduced, and the instructional procedures for each session. These materials were provided to the instructor who taught the experimental group to ensure consistency in the implementation of the intervention. In contrast, the instructor of the control group continued teaching the same course content using the conventional approach, which did not include explicit instruction in cognitive reading strategies.

Instruction in the experimental group focused on the explicit teaching and modelling of multiple cognitive reading strategies designed to support academic reading comprehension and vocabulary learning in the Advanced Reading course. These strategies included the use of imagery and sound-based techniques to enhance students' word retention, elaboration strategies to connect new information with prior knowledge, and higher-order strategies such as prediction, paraphrasing, identifying key ideas, classifying information, and making

inferences. Strategies were introduced systematically, with the instructor first explaining the purpose of each strategy, demonstrating its use through guided examples, and then providing opportunities for supported practice. As students became more familiar with the strategies, instructional support was gradually reduced following a scaffolding approach, encouraging learners to apply the strategies independently and fostering a sense of competence, control, and sustained engagement with academic reading.

2.5 Data Analysis

Quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS, Version 29) in two stages. First, descriptive statistics (means and standard deviations) were calculated to summarise students' intrinsic motivation, extrinsic motivation, and reading self-efficacy. Second, inferential analyses were conducted to examine the effects of the instructional intervention and the relationships among the study variables. Analysis of covariance (ANCOVA) was used to compare post-test scores of the experimental and control groups on intrinsic and extrinsic motivation while controlling for corresponding pre-test scores. ANCOVA was selected as it adjusts for baseline differences and provides a more accurate estimate of intervention effects (Pallant, 2020). Pearson product–moment correlation analysis was also performed to examine the relationships between motivation variables and reading self-efficacy at the post-intervention stage, as the variables were continuous and the analysis aimed to assess the strength and direction of association (Pallant, 2020). Prior to analysis, all statistical assumptions were examined and met, including homogeneity of regression slopes, linearity, homogeneity of variances, normality of residuals, and the assumptions underlying Pearson correlation.

3. Results

3.1 Research Question One: Effect of the Intervention on Intrinsic Motivation

Research question one examined whether explicit cognitive reading strategy instruction had a significant effect on Jordanian EFL undergraduates' intrinsic motivation. Table 1 presents the descriptive statistics for post-test intrinsic motivation scores for the experimental and control groups. As shown in the table, students who received explicit cognitive reading strategy instruction demonstrated substantially higher levels of intrinsic motivation (M = 3.66, SD = 0.37, N = 45) compared to students in the control group (M = 2.01, SD = 0.32, N = 45). The difference in mean scores indicates a marked advantage in intrinsic motivation for the students in the experimental group. The overall post-test mean across both groups was 2.83 (SD = 0.90, N = 90), reflecting considerable variation attributable to instructional condition. Because descriptive statistics were not sufficient to measure the effect of the intervention, an analysis of covariance (ANCOVA) was conducted using SPSS.

The results of ANCOVA are reported in Table 2. After controlling for pre-test intrinsic motivation, a statistically significant effect of instructional group on post-test intrinsic motivation was observed, $F(1, 87) = 480.90$, $p < .001$. The effect size associated with this difference was very large (partial $\eta^2 = .847$). This indicates that group membership accounted for a substantial proportion of variance in post-test intrinsic motivation scores. As also shown in Table 2, pre-test intrinsic motivation did not significantly predict post-test intrinsic motivation after controlling for group differences, $F(1, 87) = 1.62$, $p = .207$, partial $\eta^2 = .018$. This suggests that the observed post-test differences were primarily attributable to the instructional intervention rather than to initial motivational differences between students. The overall ANCOVA model was statistically significant, $F(2, 87) = 256.81$, $p < .001$, explaining approximately 85.5% of the variance in post-test intrinsic motivation ($R^2 = .855$; adjusted $R^2 = .852$), as shown in Table 2. Taken together, the descriptive and inferential statistics reported in Tables 1 and 2 provide strong evidence that explicit cognitive reading strategy instruction had a pronounced and statistically significant effect on Jordanian EFL undergraduates' intrinsic motivation for academic reading.

Table 1. Descriptive statistics for post-test intrinsic motivation by group

Group	Mean	Std. Deviation	N
Experimental	3.6556	.37420	45
Control	2.0111	.31513	45
Total	2.833	.895	90

Table 2. ANCOVA results for post-test intrinsic motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	61.036[a]	2	30.518	256.813	<.001	.855
Intercept	50.192	1	50.192	422.369	<.001	.829
Intrinsic motivation Pre-test	.192	1	.192	1.615	.207	.018
Group	57.147	1	57.147	480.898	<.001	.847
Error	10.339	87	.119			
Total	793.875	90				
Corrected Total	71.375	89				

a. R Squared = .855 (Adjusted R Squared = .852)

3.2 Research Question Two: Effect of the Intervention on Extrinsic Motivation

Research question two examined whether explicit cognitive reading strategy instruction had a significant effect on Jordanian EFL undergraduates' extrinsic motivation. Table 3 presents the descriptive statistics for post-test extrinsic motivation scores for the experimental and control groups. As shown in Table 3, students in the experimental group reported higher levels of extrinsic motivation

(M = 3.00, SD = 0.43, N = 45) than those in the control group (M = 2.09, SD = 0.49, N = 45). The overall mean extrinsic motivation score across both groups was 2.54 (SD = 0.65, N = 90). These descriptive results suggest a positive effect of the intervention on students' extrinsic motivation. However, descriptive analysis cannot reveal the effect of explicit cognitive reading strategy instruction on Jordanian EFL undergraduates' extrinsic motivation.

Table 3. Descriptive statistics for post-test extrinsic motivation

Group	Mean	Std. Deviation	N
Experimental	3.0000	.42640	45
Control	2.0889	.49441	45
Total	2.544	.648	90

The results of ANCOVA for extrinsic motivation are presented in Table 4. After controlling for pre-test extrinsic motivation, the ANCOVA revealed a statistically significant main effect of instructional group on post-test extrinsic motivation, F (1, 87) = 81.05, $p < .001$, with a large effect size ($\eta p^2 = .482$). This finding indicates that students who received explicit cognitive reading strategy instruction demonstrated significantly higher levels of extrinsic motivation than those who received conventional instruction. As also shown in Table 4, pre-test extrinsic motivation did not have a statistically significant effect on post-test extrinsic motivation, F (1, 87) = 1.50, $p = .225$, $\eta p^2 = .017$. This suggests that differences in post-test extrinsic motivation were largely attributable to the instructional intervention rather than to initial motivational differences. The overall ANCOVA model was statistically significant, $F(2, 87) = 44.81$, $p < .001$, accounting for approximately 50.7% of the variance in post-test extrinsic motivation ($R^2 = .507$; adjusted $R^2 = .496$), as reported in Table 4. Hence, the results reported in Tables 3 and 4 indicate that explicit cognitive reading strategy instruction had a statistically significant and substantial positive effect on Jordanian EFL undergraduates' extrinsic motivation.

Table 4. ANCOVA results for post-test extrinsic motivation

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	18.995[a]	2	9.497	44.812	<.001	.507
Intercept	30.141	1	30.141	142.218	<.001	.620
Extrinsic motivation Pre-test	.317	1	.317	1.496	.225	.017
Group	17.177	1	17.177	81.045	<.001	.482
Error	18.439	87	.212			
Total	620.111	90				
Corrected Total	37.433	89				

a. R Squared = .507 (Adjusted R Squared = .496)

3.3 Research Question Three: Effect of the Intervention on Self-efficacy

The study also examined whether the instructional intervention influenced students' self-efficacy in academic reading. Descriptive statistics and inferential analyses are reported in Table 5 presents the descriptive statistics for post-test self-efficacy scores for the experimental and control groups. As shown in the table, students in the experimental group reported higher levels of self-efficacy (M = 2.80, SD = 0.39, N = 45) than those in the control group (M = 2.05, SD = 0.37, N = 45). The overall mean self-efficacy score across both groups was 2.43 (SD = 0.53, N = 90). These descriptive results indicate a clear advantage for students who received explicit cognitive reading strategy instruction.

Table 5. Descriptive statistics for post-test self-efficacy

Group	Mean	Std. Deviation	N
Experimental	2.8000	.38697	45
Control	2.0519	.37407	45
Total	2.4259	.53359	90

The results of ANCOVA for self-efficacy are reported in Table 6. After controlling for pre-test self-efficacy, the ANCOVA revealed a statistically significant main effect of instructional group on post-test self-efficacy, $F(1, 87) = 76.75$, $p < .001$, with a large effect size (partial $\eta^2 = .469$). This finding indicates that students in the experimental group demonstrated significantly higher self-efficacy than those in the control group after the intervention. As also shown in Table 6, pre-test self-efficacy did not significantly predict post-test self-efficacy when group membership was controlled, $F(1, 87) = 0.42$, $p = .519$, partial $\eta^2 = .005$. This suggests that the observed post-test differences in self-efficacy were largely attributable to the instructional intervention rather than to initial differences between students. The overall ANCOVA model was statistically significant, $F(2, 87) = 43.40$, $p < .001$, explaining approximately 49.9% of the variance in post-test self-efficacy ($R^2 = .499$; adjusted $R^2 = .488$), as shown in Table 6. Overall, the results reported in Tables 5 and 6 demonstrate that explicit cognitive reading strategy instruction had a statistically significant and substantial positive effect on Jordanian EFL undergraduates' self-efficacy in academic reading.

Table 6. ANCOVA results for post-test self-efficacy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	12.655[a]	2	6.327	43.399	<.001	.499
Intercept	20.411	1	20.411	139.995	<.001	.617
Self-efficacy Pre-test total	.061	1	.061	.419	.519	.005
Group	11.190	1	11.190	76.749	<.001	.469
Error	12.685	87	.146			
Total	555.000	90				
Corrected Total	25.340	89				

a. R Squared = .499 (Adjusted R Squared = .488)

3.4 Answer to Research Question Four: Correlations between Motivation, and Self-Efficacy

Research question four examined the relationships among Jordanian EFL undergraduates' intrinsic motivation, extrinsic motivation, and self-efficacy following the instructional intervention. Table 7 presents the Pearson product–moment correlation coefficients among the three post-test variables. As shown in the table, intrinsic motivation was strongly and positively correlated with extrinsic motivation, $r(88) = .71$, $p < .001$. This finding indicates that students who reported higher levels of intrinsic motivation also tended to report higher levels of extrinsic motivation at the post-test stage. This can reflect that the two motivational orientations co-occurred rather than functioning independently. In addition, intrinsic motivation demonstrated a strong positive relationship with self-efficacy, $r(88) = .70$, $p < .001$. This result can reveal that students who were more intrinsically motivated to engage in academic reading also tended to report higher confidence in their ability to understand texts, apply strategies, and perform successfully in reading-related tasks.

As further shown in Table 7, extrinsic motivation was very strongly correlated with self-efficacy, $r(88) = .84$, $p < .001$. According to guidelines proposed by Cohen (1988), this coefficient represents a very strong association, indicating a close alignment between students' externally driven motivational goals (e.g., grades and performance outcomes) and their self-efficacy beliefs at the post-test stage. Hence, the correlation results reported in Table 7 indicate that intrinsic motivation, extrinsic motivation, and self-efficacy were strongly and positively interrelated following the intervention program. These findings suggest that students who were more motivated, whether by interest or external rewards, also felt more confident in their academic reading abilities.

Table 7. Correlations among intrinsic motivation, extrinsic motivation, and self-efficacy

		Intrinsic motivation post-test total	Extrinsic motivation post-test total	Self-efficacy post-test Total
Intrinsic motivation post-test total	Pearson Correlation	1	.711**	.700**
	Sig. (2-tailed)		<.001	<.001
	N	90	90	90
Extrinsic motivation post-test total	Pearson Correlation	.711**	1	.841**
	Sig. (2-tailed)	<.001		<.001
	N	90	90	90
Self-Efficacy Post-test Total	Pearson Correlation	.700**	.841**	1
	Sig. (2-tailed)	<.001	<.001	
	N	90	90	90

***. Correlation is significant at the 0.01 level (2-tailed).*

4. Discussion

This study examined the effects of explicit cognitive reading instruction on Jordanian EFL undergraduates' intrinsic motivation, extrinsic motivation, and self-efficacy, as well as the correlations among these constructs after the implementation of the intervention program. Overall, the findings of this study demonstrated that the intervention program has resulted in substantial gains across all the three affective-motivational variables, accompanied by strong correlations among motivation and self-efficacy. The findings that explicit cognitive reading strategy instruction significantly enhanced learners' intrinsic motivation aligns closely with earlier research on motivational benefits of strategy-based instructions. In particular, the results of our study are consistent with Kavani and Amjadiparvar (2018), who reported higher motivation among Iranian EFL learners receiving strategy-based instruction. Furthermore, our findings suggest that strategy instruction functions not only as a cognitive support but also as an affective catalyst that promotes learners' interest and engagement in academic reading. Importantly, this study extends the work of Kavani and Amjadiparvar (2018) by showing that intrinsic motivation can strongly encourage EFL learners to view reading as a meaningful intellectual activity rather than merely an assessment-driven task. In contrast, the findings of our study differ from those of Li et al. (2022), who reported no significant effects of explicit instruction on reading motivation among Chinese university EFL students. One possible explanation for this discrepancy is that, although the participants in Li et al. (2022) expressed positive views about the instruction in interviews, the quantitative measures may not have been sensitive enough to capture gradual motivational change, or the contextual demands may have limited the impact on motivation. In our study, the systematic modelling, guided practice, and repeated application of cognitive strategies may have provided stronger mastery experiences, which in turn supported growth in intrinsic motivation.

The clear improvement in extrinsic motivation suggests that explicit instruction of cognitive reading can strengthen EFL students'

practical engagement with academic reading. This finding is consistent with Kavani and Amjadiparvar (2018) and Alzubi (2024), both of who showed that when learners are taught cognitive strategies explicitly, they become more motivated and better able to see the value of reading for academic success. These results also suggest that when EFL students view strategies as useful tools for achieving course goals, external factors such as grades and performance outcomes become more motivating rather than restrictive. Importantly, our findings challenge the assumption that strategy instruction mainly enhances intrinsic motivation while leaving extrinsic motivation unhanged. Instead, both intrinsic and extrinsic types of motivation appear to develop together following explicit instruction of cognitive strategies.

The strong gains in EFL students' self-efficacy reported in our study are in line with earlier research showing that explicit instruction can boost EFL students' confidence in reading. In other words, similar results were reported by Fathi and Soleimani (2020) and Valizadeh (2021), who found that EFL learners felt more capable of handling reading tasks after receiving strategy-based instruction, likely because such instruction provides repeated experiences of success. The findings of our study also echo Van Keer and Verhaeghe (2005), who showed that explicit strategy instruction can lead to lasting improvements in EFL students' self-efficacy. In contrast, Li et al. (2022) reported no significant quantitative gains in self-efficacy, suggesting that instructional context, duration of the intervention, or prior experience may influence whether perceived benefits translate into measurable confidence gains. Overall, these comparisons highlight the importance of sustained and well-scaffolded strategy instruction in strengthening EFL learners' self-efficacy.

The strong correlations found among intrinsic motivation, extrinsic motivation, and self-efficacy highlight how closely motivation and self-efficacy are connected in EFL academic reading. Learners who felt more confident in their reading abilities were also more motivated, both in terms of personal interest and external goals such as grades. Rather than suggesting overlap between these three constructs, our findings point to a mutually reinforcing system in which motivation and self-efficacy develop together, supported by explicit cognitive strategy instruction. This interpretation helps contextualise earlier findings reported by Suyitno (2017), which showed that cognitive strategies can contribute positively or negatively to reading outcomes depending on how appropriately they are selected and applied. When strategies are taught explicitly and coherently, they are more likely to enhance learners' motivation and confidence rather than be used ineffectively.

5. Conclusion

The findings showed that explicit strategy instruction led to meaningful improvements across all three affective–motivational variables, suggesting that such instruction supports not only cognitive engagement with texts but also learners' motivation and confidence in academic reading. EFL students who received systematic modelling and guided practice reported greater interest in reading, stronger goal-oriented motivation, and higher self-efficacy. In addition, the strong correlations observed among intrinsic motivation, extrinsic motivation, and self-efficacy indicate that these constructs develop together as a mutually reinforcing system when supported by explicit cognitive strategy instruction. Overall, the study highlights the value of well-scaffolded strategy instruction in shaping EFL learners' motivational orientations and self-efficacy in higher education contexts, while contributing empirical evidence from an underrepresented EFL setting.

The findings of this study suggest that EFL teachers should make cognitive reading strategies a visible regular part of academic reading instruction. By clearly modelling strategies such as predicting, inferencing, summarising, and checking understanding, and by giving students guided practice, teachers can help L2 students feel more confident and engaged when working with academic texts. At the program level, including strategy-focused reading components and offering support for teachers can make it easier to implement this approach effectively.

Despite its contributions, this study has some limitations that should be acknowledged. First, the findings are based on data from a single higher education EFL context in Jordan, which may limit their generalisability to other educational settings. Future studies conducted in different EFL contexts would help to confirm and extend these findings. Second, the study relied on self-report questionnaires to measure motivation and self-efficacy, which may reflect students' perceptions rather than direct observation of behaviour. In addition, although the intervention focused on explicit cognitive reading strategy instruction, the study did not examine how individual strategies were used or which instructional features contributed most strongly to the observed outcomes. Future research could address these limitations by exploring motivational and self-efficacy outcomes across diverse EFL contexts and by combining self-report measures with qualitative approaches to gain deeper insights into EFL learners' experiences with explicit strategy instruction.

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Author contributions

Dr. Abdulhameed Alawabdeh and Dr. Abeer Albashtawi were responsible for literature, design, and data analysis. Dr Ibrahem Bani Abdo was responsible for data collection. Dr Reema Oqla and Raed ALmahrat were responsible for discussion, editing and revising the final manuscript. All authors read and approved of the final manuscript. Dr Abdelhameed Al Awabdeh, is the correspondent author.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Appendix A

Motivation Questionnaire

Dear Student,

You are kindly invited to participate in this study by completing the following questionnaire, which will take approximately 10 minutes. The purpose of this questionnaire is to collect information about your motivation and self-efficacy related to academic reading in the *Advanced Reading* course. Please respond to all items honestly. There are no right or wrong answers, and your responses will be kept confidential.

If you have any question about this study, feel free to contact the researcher at abeerbashtawi11@gmail.com

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Please indicate how often each statement applies to you by ticking **one** option only.

1 = Never 2 = Occasionally 3 = Sometimes 4 = Usually 5 = Always

	Statements	1	2	3	4	5
	Intrinsic Goal Orientation					
1	I prefer to read academic texts that really challenges me so that I can learn new vocabulary.					
2	I prefer to read academic texts that arouses my curiosity, even if it has difficult vocabulary.					
3	The most satisfying thing for me in the academic reading is trying to understand the content as possible as thoroughly.					
4	When I have the opportunity in the 'Advanced Reading' course, I choose course assignments that I can learn from even if they do not guarantee a good grade.					
	Extrinsic Goal Orientation					
5	The most important thing for me right now is improving my overall grade point average, so my concern in 'Advanced Reading' course is getting a good grade.					
6	Getting a good grade in 'Advanced Reading' course is the most satisfying thing for me right now.					
7	I want to do well in 'Advanced Reading' course because it is important to show my abilities to my teacher, family and friends.					
	Self-Efficacy for Learning and Performance					
8	I expect to do better than others when I learn new words.					
9	I am certain that I can understand the ideas taught in my 'Advanced Reading' classes.					
10	I think I am a good student who can make use of learning strategies to achieve goals.					
11	I am sure I can do an excellent job in the 'Advanced Reading' class assignments when it comes to vocabularies.					
12	Understanding the meanings of words will help me to get good grades in my examinations.					
13	My reading and vocabulary skills are excellent compared to other students the 'Advanced Reading' course.					