



THE USE OF RECIPROCAL TEACHING IN TEACHING MONITORING SKILLS TO EFL UNIVERSITY STUDENTS

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Abstract:

This paper examines the impact of Reciprocal Teaching (RT) on fostering monitoring skills—questioning, predicting, clarifying, and summarizing—among Moroccan EFL university students. Using a quasi-experimental design, this paper evaluates the performance of two groups in pre-, post-, and delayed tests. The participants were sixty Moroccan EFL university learners (N=60). Reciprocal teaching was employed to instruct the experimental group (n=30) in four monitoring skills—questioning, predicting, clarifying, and summarising (Palincsar & Brown, 1984). Nonetheless, the control group (n=30) was taught differently. The Repeated-Measures ANOVA Test and the One-way MANOVA Test were utilized to run the statistical analysis. At the end of the intervention, a feedback questionnaire was given to the experimental group. The findings add to the ongoing discussion about the effectiveness of RT in fostering monitoring skills in different cultural settings. Replicated in an under-researched context, RT enabled Moroccan second-year university students in the experimental group to sustain gains and score higher in clarifying, questioning, summarizing, and predicting. The findings of the feedback questionnaire also aligned with the study's overall results. Implications, future research, and limitations are also discussed.

Keywords: clarifying, comprehension-monitoring, monitoring skills, predicting, questioning, reading comprehension, reciprocal teaching, summarising

1. Introduction

This paper examines the impact of Reciprocal Teaching (RT) on fostering monitoring skills—questioning, predicting, clarifying, and summarizing—among Moroccan EFL university students. To compare the performance of two groups, this study employs a quasi-experimental design and distributes pre-, post-, and delayed tests. This topic is under-researched in EFL settings, particularly in Morocco. Hence, the current study

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supports empirical research on reading comprehension at large and the impact of RT on fostering monitoring skills in different cultural settings in particular.

The Moroccan EFL setting is characterized by a combination of multilingualism, exam-oriented instruction, and impoverished exposure to real English outside the classroom (Bouziane, 2018). The diglossic situation in Morocco presents a continuum, where Arabic and French dominate public life and formal education. For instance, English is utilized as a foreign language in the public sector from middle school onward, and it is becoming more significant in higher education (Belhiah & Abdelatif, 2016). Having said this, instruction is still heavily form-based and teacher-centred, emphasizing reading for content instead of strategy use. Additionally, numerous cultural variables impede the development and application of metacognitive strategies (e.g., comprehension monitoring) in Morocco. These include teacher authority, focus on memorization and rote learning, and a lack of opportunities for learner autonomy (Ennaji, 2005). In this regard, reciprocal teaching represents a promising shift toward student-centred learning, which is consistent with contemporary educational reforms and helps students become more active in their reading processes. Hence, investigating RT in this under-researched context adds further insights into the global conversation on culturally responsive reading instruction and strategic language learning in EFL settings. Numerous studies examined the authentic study by Brown & Palincsar (1982) (e.g., Chen *et al.*, 2023; Doolittle *et al.*, 2006; El Hamydy & Brigui, 2022; 2023; Morrison, 2004; Rosenshine & Meister, 1994; Spörer *et al.*, 2009; Yang, 2006). According to these scholars, reciprocal teaching is a vital metacognitive reading strategy that is employed to foster and remedy reading proficiency. Earlier research was carried out in a distinct context, and the results corroborate the vital role of RT in fostering monitoring skills (Morrison, 2004; Rosenshine & Meister, 1994). For this reason, this paper adds to the ongoing discussion about the effectiveness of RT in fostering monitoring skills in different cultural settings, as empirical research involving Moroccan subjects appears to be scarce in this aspect of reading research in Morocco. Although reading is considered an essential skill for academic success, there seems to be a wide divergence among textbook designers and ELT practitioners on the best way to approach reading in an EFL context (Ali *et al.*, 2022). Among metacognitive strategies, reciprocal teaching remains an essential meta-cognitive reading strategy employed to address the common issue of poor reading comprehension among students in higher education (Doolittle *et al.*, 2006). Reciprocal teaching is employed in teaching to foster students' reading proficiency with a focus on the following monitoring skills: questioning, predicting, clarifying and summarizing (Hart & Speece, 1998). This claim has been tested in different cultural settings, in which RT proves effective. Consequently, this study supports the ongoing discussion about the impact of reciprocal teaching on fostering monitoring skills in various cultural settings, as empirical research involving Moroccan subjects seems to be rare in this aspect of research. This paper also purports to draw informative pedagogical implications that instructors can implement successfully in the classroom. The following research questions are advanced to achieve the objectives above:

Q1: To what extent does reciprocal teaching improve EFL college students' monitoring skills— summarising, clarifying, questioning, and predicting?

Q2: Does the intervention influence the performance of the experimental group in the four monitoring skills?

Q3: How do participants in the experimental group perceive the impact of the intervention on monitoring skills?

Q4: Is there an effect of the intervention on students' ability to sustain gains over time?

2. Literature Review

2.1 Models of Reading

Broadly defined as an interactive process wherein the reader is constantly interacting with the written text, reading is an essential skill that contributes to learners' proficiency in language acquisition or learning (Rumelhart, 1977; Tracey and Morrow, 2024). In this respect, the models of top-down and bottom-up are fused, acting in an order that relies on the topic and background knowledge of the reader. *"Readers also trigger their schemata for a topic, which serves as a reference store from which one can retrieve prior knowledge, and make use of it to anticipate, infer and make different decisions about it"* (Anderson & Pearson, 1984; Hattan *et al.*, 2024). Reading comprehension involves an inventory of both cognitive and metacognitive strategies, such as comprehension monitoring, which refers to the evaluation and regulation of one's understanding (Casanave, 1988; Wannagat *et al.*, 2024).

2.2 Comprehension Monitoring

Explicit teaching of text comprehension, which aims to assist struggling and novice readers, has attracted the attention of several researchers (e.g., Doolittle *et al.*, 2006; Chinpakdee & Gu, 2024; Morrison, 2004; Rosenshine & Meister, 1994). The idea behind explicit instruction is to provide readers with cognitive and meta-cognitive strategies, the aim of which is to assist them in overcoming barriers that impede understanding. Hence, comprehension monitoring is considered the most important metacognitive strategy in helping readers enhance their reading skills (Wannagat *et al.*, 2024). Similarly, comprehension monitoring refers to the process of evaluating, observing, revising, and taking the needed action to foster one's ability to comprehend a given text (Casanave, 1988). Consequently, helping poor readers to improve their comprehension and increasing their awareness of their reading strategies is at the heart of comprehension monitoring.

The main objective of teaching comprehension monitoring is to equip students with the ability to regulate, monitor and check their comprehension (Palincsar & Brown, 1984). Teachers can present comprehension monitoring to students through the teaching of these techniques: Reciprocal Teaching (RT) (Palincsar & Brown, 1984) and a think-aloud procedure (Bereiter & Bird, 1985). Reciprocal teaching, which is *"a teaching procedure in which the adult teacher and a group of students take turns leading class discussion, usually through the use of dialogues"*, was first developed by Palincsar & Brown (1984).

Several researchers examined the issue of reciprocal teaching (e.g., Chen *et al.*, 2023; Doolittle *et al.*, 2006; El Hamydy & Brigui, 2022; Morrison, 2004; Rosenshine & Meister, 1994; Spörer *et al.*, 2009; Yang, 2006). These studies were conducted in different cultural settings, highlighting the effectiveness of RT in improving comprehension-monitoring skills. Hence, this study is a contribution to the field of EFL reading comprehension by empirically investigating the effectiveness of RT in enhancing monitoring skills among Moroccan EFL university students. Using a quasi-experimental design, this paper evaluates the performance of two groups in pre-, post-, and delayed tests. This paper addresses a gap in the literature by assessing the longitudinal effect of RT on monitoring skills—questioning, predicting, clarifying, and summarizing— among Moroccan EFL university students.

2.3 Reciprocal Teaching Procedure

Cooperative forms of learning and teaching, such as Reciprocal Teaching, have been the focus of researchers within the paradigm of reading for over eighty decades. Reciprocal Teaching, which was pioneered by Palincsar & Brown (1984), involves the reciprocal interaction of experts and novice readers. It has been acclaimed by different scholars (e.g., Chen *et al.*, 2023; Doolittle *et al.*, 2006; El Hamydy & Brigui, 2022; 2023; Huang and Yang, 2015; Morrison, 2004; Rosenshine & Meister, 1994; Spörer *et al.*, 2009; Yang, 2006) as one of the most classroom-based instructional strategies.

According to Palincsar & Brown (1984), “*reciprocal teaching is an instructional method wherein the adult teacher and a group of students take turns leading class discussions*”. During this class discussion, the dialogue leader (teacher or student) should generate questions that tap the main idea of the text, provide a brief, coherent summary, clarify misunderstandings or ambiguities in the text, and predict future text content. Doolittle *et al.* (2006) consider reciprocal teaching as the solution to the problem of poor reading comprehension strategies; they advanced that reciprocal teaching consists of three fundamental pillars: the dialogue, the appropriate use of the instructor by the students, and the comprehension-monitoring skills. They also emphasised that reciprocal teaching aims to show students why, when, where, and how to employ these monitoring skills. Similarly, Mafarja *et al.* (2023) referred to reciprocal teaching as “*an instructional technique, in which reading comprehension is seen as a problem-solving skill that aims to foster comprehension while reading*”. Therefore, while reading, readers practise four reading comprehension strategies: generating questions, providing summaries, clarifying words’ meaning or confusing text, and predicting. These will be discussed in detail in the following subsection.

2.4 Comprehension-monitoring Skills

Grounded in the reciprocal teaching approach (Palincsar & Brown, 1984), four monitoring skills are at the heart of this study. In the present study, these skills are operationalised as follows: *Questioning* involves learners generating three main questions that they think the article (s) would discuss based on Pearson & Johnson’s taxonomy (1978). *Clarifying* involves saying whether some sentences are true or false, with the

justification from the text. *Predicting* involves students finding words that have the same meaning as the ones given in the question. *Summarizing* relates to writing a précis of the article (s), “based on five macro-rules, including deletion of trivia, deletion of redundancy, superordination, selection, or invention of a topic sentence” (see Brown & Day, 1983). The following section discusses earlier empirical research about reciprocal teaching.

2.5 Empirical Findings

Several researchers investigated the topic of Reciprocal Teaching (Alsalmi *et al.*, 2024; Butar *et al.*, 2023; Chen *et al.*, 2023; Doolittle *et al.*, 2006; El Hamydy & Brigui, 2022; 2023; Huang and Yang, 2015; Morrison, 2004; Rosenshine & Meister, 1994; Spörer *et al.*, 2009; Yang, 2006). For example, Alsalmi *et al.* (2024) carried out a longitudinal study to examine the impact of RT on the academic performance of teacher trainees registered in Ajman University in the United Arab Emirates. The post-test scores showed significant mean differences between the control and experimental groups. They further suggested aligning teaching strategies (e.g., reciprocal teaching) with the needs of all learners irrespective of their backgrounds. Chen *et al.* (2023) carried out an experimental study wherein reciprocal teaching was used to observe students’ performance and interaction in class and their impact on their motivation and academic success. They emphasized that the implementation of RT in class fostered students’ willingness to read better and inspired them to learn more.

Additionally, Yang (2006) conducted a correlational study to investigate the relationship between comprehension-monitoring and reading strategies in EFL reading comprehension. He used think-aloud and retrospective verbal reports to assess the reading performances of twenty EFL students. He reported that comprehension-monitoring skills help readers evaluate and regulate their comprehension beyond the text, whereas reading strategies aid readers in dealing with language-related problems within the text. Whether or not these strategies are effective depends on their appropriate use in particular reading contexts. He noted that comprehension-monitoring skills and reading strategies can be used interchangeably when utilized for self-evaluation. Although Yang (2006) highlighted the importance of EFL instruction to incorporate comprehension-monitoring skills for better reading outcomes, his study overlooks the active interaction between strategy use and language proficiency, and it neglects individual learner differences, as well as failing to evaluate the sustained impact of the monitoring skills.

Furthermore, Spörer *et al.* (2009) assessed the impact of three strategy instruction methods on the reading comprehension performance of 210 elementary students. Subjects were assigned to reciprocal teaching, paired practice, instructor-guided groups, and a control group. They reported that subjects in the training groups outscored those in the control group in reading proficiency and strategy use. Morrison (2004) also studied the effect of comprehension monitoring on reading proficiency among undergraduate students in both English and French. The findings showed a high correlation between comprehension monitoring and reading proficiency in both languages. Notably, F1 participants outscored CF participants in French discourse and propositional-level

monitoring, and no differences were found in other aspects. Although this study reported the main differences in the factors that predict L2 reading proficiency between F1 and CF participants, it failed to report the variables predicting reading proficiency for students from different language backgrounds.

Another significant study by Doolittle *et al.* (2006) examined the issue of poor reading comprehension among university students when reading different texts. Their study proposes direct teaching of reading comprehension strategies, especially reciprocal teaching, as a solution. They also shed light on the basics and principles of reciprocal teaching and share their individual classroom practices. Their examples showcase the flexibility and transferability of reciprocal teaching across various academic domains. Their study highlights reciprocal teaching as an efficient reading comprehension procedure that involves students in critically assessing reading comprehension texts.

Other studies were carried out to explore the attitudes and perceptions of participants towards reciprocal teaching. For instance, Chang and Lan (2021) examined the use and the perspectives of undergraduate EFL learners of an RT application based on Moodle. At the end of the training, the subjects described the Moodle-based RT application as an effective teaching tool. In principle, they reported practical implications for researchers, instructors, and policy experts to design new reading courses based on a Moodle RT application.

3. Methodology

3.1 Subjects

A number of sixty Moroccan EFL second-year university students (N=60) participated in the present study. They are majoring in Management and Communication, and in particular, Management Techniques and Logistics, Management and Transportation at ENSA in Berrechid, Morocco. The students aged 20 to 24 belong to middle socio-economic classes. They are all native speakers of Moroccan Arabic, and they studied English in a formal setting for at least six years. The choice of second-year university students was based on the assumption that these participants had reached a level of language proficiency that would facilitate the delivery and instruction of monitoring skills. An experimental group (n = 30) and a control group (n = 30) took part in this study. Reciprocal teaching was employed to instruct the experimental group (n=30) in four monitoring skills—questioning, predicting, clarifying, and summarising (Palincsar & Brown, 1984). However, the control group (n=30) was taught differently. Nonetheless, all subjects dealt with the same topics and issues and received the same sessions. The teacher of both groups received a lesson plan for each session as well as prior information about the study's implementation, rationale and importance. The researcher was present in all sessions to observe and verify protocols.

3.2 Instruments

This study's instruments involved reading articles, lesson plans, pre-, post-, and delayed tests. Besides the reading texts employed in the tests, ten reading articles were covered

in the intervention. These reading selections were pertinent to students' level and interest, as they covered topics related to management, marketing, communication, human resources, logistics, etc.

Additionally, a lesson plan for each reading article was developed to guide the instructor, prevent any potential effects of the teacher variable, and give the instructor helpful insights on how to deliver the intervention. To ensure homogeneity between groups, a pre-test was administered to both groups before the intervention. A post-test was given to all subjects when the intervention ended to compare their performances. To determine if the treatment would have a sustained impact on the subjects' performances, a delayed post-test was administered four weeks following the end of the intervention. The value of Cronbach's alpha ranged from .74 to .83. Using the 'split-half method' and 'the odd-even method', the findings showed that both halves of the three tests were positively correlated at a significant level of probability ($p < .05$). The sole qualitative instrument employed in this study was a feedback questionnaire given to the training group. Table 1 describes the major characteristics of the reading texts employed in the tests.

Table 1: Key features of the tests used in the study

Tests	Title	"Number of words (tokens)"	"Lexical density"	"Lexical variation"	"N° of idea units"
Pre-	Management styles	347	0, 51	0.55	18
Post-	Communication	350	0,51	0.55	21
Delayed test	Building relations	347	0,49	0.56	18

3.3 Procedure

Table 2 describes the five phases of the current study.

Table 2: Structure of the intervention study

Preparatory stage	Pre-test 1 week before the intervention	Intervention 5 weeks - 10 sessions	Immediate post-test, just after the training	Delayed post-test, 4 weeks after the training
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The experimental group used in this study is an intact group of thirty students from ENSA Berrechid ($n = 30$). Participants in the experimental group were exposed to the reciprocal teaching procedure. Ten training sessions were covered during the intervention, twice a week, and each took one hour and a half.

Reciprocal teaching—a metacognitive reading strategy developed by Brown & Palincsar (1982)—is implemented in the classroom to aid students in their reading comprehension. Grounded in the reciprocal teaching approach (Palincsar & Brown, 1984), four monitoring skills are at the heart of this study. *Questioning* involves learners generating three main questions that they think the article (s) would discuss based on Pearson & Johnson's taxonomy (1978). *Clarifying* involves saying whether some sentences

are true or false, with the justification from the text. *Predicting* involves students finding words that have the same meaning as the ones given in the question. *Summarizing* relates to writing a précis of the article (s), “*based on five macro-rules, including deletion of trivia, deletion of redundancy, super-ordination, selection, or invention of a topic sentence*” (see Brown & Day, 1983).

The first article covered in the intervention discusses communication with employees. It sheds light on some advantages of consultation and involving employees in the management of a company. Before asking students to preview the article, the instructor briefly explained RT and how it operates. The subjects were requested to look at the title, picture (s), words in italics, etc., and formulate three main questions they thought the article would discuss. The instructor reminded the students that self-questioning oneself before reading helps in predicting the content of the text. After modelling how to generate questions, the instructor gave the floor to the leaders of the groups to model the skill of questioning. These are some of the questions that students could formulate based on the title, picture, and words in italics: *How can we put workers into the picture? What are the benefits of integrating workers into the picture? How do workers impact the environment?*

The second skill students were asked to model was clarifying. The speaker of group one assumed the role of the instructor and modelled the first statement, and the members of the same group were supposed to answer the question with a valid justification from the text. After that, the floor was given to another student, who modelled the second statement, and his classmates had to determine its falsity or truth with justification from the article. The third statement was modelled by a third student, whose classmates were asked to decide on its truth or falsity, justifying their response from the text.

The third skill was predicting. The teacher modelled how to infer words’ meanings based on the context. He highlighted the importance of knowing the grammatical category of a word; knowing the grammatical category a word belongs to is a useful method for predicting a word's meaning. He engaged students in a dialogue, wherein he uttered the words (e.g., argument, move forward, delegates, and convinced), and students were supposed to find their synonyms in the article. After that, speakers of the groups took turns and modelled the same skill.

The last skill was summarizing. The instructor provided the students with some useful steps to look for the main ideas in the text. One of these steps was to read the first sentence in each paragraph, as it is often the topic sentence. The equivalent of this step was the selection of a topic sentence, according to the five macro-rules. A further step was to get rid of trivial information, that is, details that are often used to elaborate on the main idea. The teacher told students to cross out with a red pencil all sections they judged to be trivia. These details are usually located in the middle of the paragraph, and detailed sentences most often include phrases, such as ‘this means’, ‘for example’, etc. The equivalent of this step was the deletion of trivia, according to the macro rules. The instructor stated that the deletion of redundancy is the same as the previous rule, in the sense that it is concerned with wordy sentences, which are often used to amplify an idea.

However, the instructor asked students to cross out with a blue pencil all lines they judged to be redundant. As for super-ordination, there was not a clear-cut example in the reading passage, but the teacher gave an instance of it to set students on track. The last rule was the invention of a topic sentence; the teacher informed students that if a paragraph does not start with an explicitly stated topic sentence, they have to invent one, based on their understanding of that paragraph. After reminding students of the five macro rules they should follow to write a summary of the text, the instructor modelled how to summarise the first paragraph in the article. As the main idea of the first paragraph was not given explicitly, the instructor had to come up with a topic sentence (e.g., European law encourages consultation). The students were then given the floor to model summarizing the other paragraphs. Above all, students managed to provide a decent summary of the article.

The control group was also selected from ENSA Berrechid. It is an intact class of 30 subjects. The teacher taught the control group differently with the study's rationale and significance in mind. Besides three sessions devoted to the administration of the tests, the control group was also taught ten sessions, twice a week, and each lasted one hour and a half.

The first article the control group covered was about communication with employees. It shed light on some advantages of consultation and involving employees in the management of a company. In the pre-reading phase, the teacher actively involved the subjects in a discussion about the text. The questions the teacher asked students aimed at activating their background knowledge about the topic in question. The teacher elicited key words from students and wrote them on the board. In the reading phase, the teacher asked students to read the article individually and work in pairs to answer the questions. This technique helped students to cooperate and collaborate with each other. The teacher also monitored their work while they were working in pairs. After that, there was a whole class correction, wherein good students were praised for their correct answers. In the post-reading phase, the teacher divided the students into groups, and each group was asked to find an argument in favour or disfavour of direct/indirect consultation. Then each group had to present their argument (s) (and experience) to the class. The teacher followed the same procedure in the remaining sessions.

4. Results

It is vital to note that this study was built on both quantitative and qualitative data. To this end, the quantitative data included the scores of the three tests used in the study. However, the qualitative data constitutes the feedback questionnaire given only to the training group.

4.1 Descriptive Statistics

Descriptive statistics reveal that all subjects scored the same in the pre-test (i.e., $M = 09.40$, $sd = .93$ for the training group and $M = 09.40$, $sd = 1.40$ for the comparison group). Nonetheless, the means of the post-test show that the training group outscored the

control group (i.e., $M = 16.33$, $sd = 1.42$ for the training group and $M = 09.06$, $sd = 1.46$ for the comparison group). In addition, the means of the delayed test (i.e., $M = 16.40$, $sd = 1.77$ for the training group and $M = 8.73$, $sd = 1.28$ for the comparison group) indicate that the training had a sustained impact on the performance of the experimental group (see Table 3).

Table 3: Descriptive Summary of the Data Set

Group	N	Pre-test		Immediate post-test		Delayed post-test	
		M	SD	M	SD	M	SD
Experimental group	30	9.40	.93	16.33	1.42	16.40	1.77
Control group	30	9.40	1.40	9.06	1.46	8.73	1.28

4.2 Inferential Statistics

Unlike descriptive statistics, which describe the basic features of a dataset, inferential statistics aim at generalizing the results to reach a larger population. We ran a Repeated-measures ANOVA Test to determine whether the findings are statistically significant. The assumptions of “normality of the data, sphericity, and homogeneity of variances” are examined in detail below.

4.3 Normality of the Data

In Table 4, the pre-test reveals no normal distribution, as the Shapiro-Wilk Test Sig. Value is less than 0.05. However, the post-test shows a normal distribution, as the Shapiro-Wilk Test Sig. Value is larger than 0.05. There is also a normal distribution in the delayed post-test, but only for the comparison group, as the Shapiro-Wilk Test Sig. Value is larger than 0.05. Thus, the null hypothesis that the data are normally distributed is refuted.

Table 4: Tests of Normality (Shapiro-Wilk)

Group		Statistic	df	Sig
Pretest	Control	.902	30	.010
	Experimental	.882	30	.003
Post-test	Control	.932	30	.054
	Experimental	.952	30	.197
Delayed post-test	Control	.943	30	.107
	Experimental	.926	30	.037

4.4 Homogeneity of Variances

Levene's Test for Equality of Variances is used to measure the homogeneity of variances. According to this test (see Table 5), variances are homogeneous for the pre-test, $F(1, 58) = .379$, $p = .540 > .05$, for the post-test, $F(1, 58) = .000$, $p = .984 > .05$, and for the delayed post-test, $F(1, 58) = 5.928$, $p = .018 < .05$. Hence, this assumption is met in the pre- and post-tests, and thus the adjusted results of homogeneity not assumed would be reported instead.

Table 5: Homogeneity of Variances Test

Tests	Levene Statistic	df1	df2	Sig.
Pre-test scores	.379	1	58	.540
Post-test scores	.000	1	58	.984
Delayed test	5.928	1	58	.018

4.5 Sphericity

Table 6 shows that the assumption of sphericity is violated because the p-value from Mauchly's Test is below .05 (that is, $p = .001 < .05$, $\chi^2(2) = 13.227$). To solve this issue, we should make modifications with *"the lower-bound estimate, Greenhouse-Geisser correction, and the Huynh-Feldt correction"* (Howell, 2002).

Table 6: Mauchly's Sphericity Test^a

Within-subjects' effect	Mauchly's W	Approx. Chi-Square	Df	Sig.	Epsilon ^b		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.793	13.227	2	.001	.828	.864	.500

According to the analysis of variance, statistically significant effects for the variable of *group* in both the post- and delayed tests were revealed, $F(1, 58) = 273.928$, $p < .05$. The results also showed a significant effect size ($p = .000$, partial eta-squared = .82) according to Cohen's *d* benchmarks. This means that the training explains 82% of the variance in students' scores.

Table 7: Between-Subjects Effects Tests

Source	Type II Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Noncent Parameter	Observed Power ^a
Intercept	24035.556	1	24035.556	5904.819	.000	.990	5904.819	1.000
Group	1115.022	1	1115.022	273.928	.000	.825	273.928	1.000
Error	236.089	58	4.070					

a. Computed using alpha = .05

According to the analysis of variance, statistically significant effects for the variable of *time* in both the post- and delayed tests were revealed, $F(1.657, 96.099) = 229.298$, $p < .05$. The results also showed a significant effect size for the variable *time* ($p = .000$, partial eta-squared = .80).

Table 8: Within-Subjects Effects Tests

Source		Type II Sum of Squares	Df	F	Sig.	Partial Eta Squared	Observed Power ^a
Time	Greenhouse-Geisser	418.711	1.657	229.298	.000	.798	1.000
	Huynh-Feldt	418.711	1.729	229.298	.000	.798	1.000
Time * Group	Greenhouse-Geisser	558.711	1.657	305.966	.000	.841	1.000
	Huynh-Feldt	558.711	1.729	305.966	.000	.841	1.000
Error (time)	Greenhouse-Geisser	105.911	96.099				
	Huynh-Feldt	105.911	100.277				

Note: Computed using alpha = .05.

According to the analysis of variance, statistically significant effects for *Time X Group* interaction in both the post- and delayed tests were revealed, $F(1.657, 96.099) = 305.966$, $p < .05$. The results also showed a significant effect size for *Time X Group* interaction ($p = .000$, partial eta-squared = .84). According to Table 8, The p-value in the column labelled 'Sig.,' indicates that this interaction is statistically significant in the post-test and delayed post-test ($p = .000$). This means that the subjects scored differently on the immediate post-test and delayed post-test.

4.6 Multivariate Analysis of Variance

The MANOVA design is employed to examine the impact of one or more factor variables on other response variables. The main characteristic of the MANOVA design is that the response variables are treated as a set rather than analysed separately from each other. This study employs a one-way between-subjects MANOVA design, as it involves one independent variable (i.e., reciprocal teaching) and four dependent variables: questioning, predicting, clarifying and summarizing.

Before delving into the analysis of this test, an examination of the data sets is required to verify "*the assumptions of multivariate normality, absence of multicollinearity, and homogeneity of variances*". To assess the presence or absence of multicollinearity, Pearson correlations were run between each pair of the four comprehension-monitoring skills. Table 9 demonstrates the mean and standard deviation and the intercorrelations among the four monitoring skills of questioning, predicting, clarifying, and summarizing in the post-test. The training group performed better in the clarifying skill ($M = 3.70$, $sd = 1.42$), questioning ($M = 3.31$, $sd = 1.05$), summarizing ($M = 3.10$, $sd = .97$), and predicting ($M = 2.58$, $sd = 1.07$). As for the inter-correlation among the four monitoring skills, a strong correlation exists between predicting and questioning ($r = .71$, $p < .05$), and predicting and clarifying ($r = .73$, $p < .05$). There is also a moderate correlation between clarifying and questioning ($r = .65$, $p < .05$), summarizing and questioning ($r = .61$, $p < .05$), summarizing and clarifying ($r = .64$, $p < .05$), and summarizing and predicting ($r = .64$, $p < .05$). This indicates that the four monitoring skills are moderately to strongly correlated, but at the same time, they represent distinct components of reading comprehension monitoring skills. This allows for comparisons among the performances of the participants on the

four monitoring skills in question. In essence, the different components of monitoring skills are significantly interrelated, but meanwhile, they seem to represent distinct components.

Table 9: Pearson Correlations, M and SDs Associated with the Monitoring Skills

	1.	2.	3.	4.	M	SD
Question Generation	1.0				3.31	1.05
Clarifying	.65	1.0			3.70	1.42
Predicting	.71	.73	1.0		2.58	1.07
Summarizing	.61	.64	.64	1.0	3.10	.97

Note: N=60; correlations greater than .10 are statistically significant ($p < .05$).

4.7 Homogeneity of Variances

Table 10 presents the results of Levene's test for homogeneity of variance, which showed statistically significant results for the variable *questioning* in the post-test, $F(1, 58) = .588$, $p = .446 > .05$, for the variable *clarifying*, $F(1, 58) = .052$, $p = .820 > .05$, (not) for the variable *predicting*, $F(1, 58) = 4.984$, $p = .029 < .05$, and for the variable *summarizing*, $F(1, 58) = .315$, $p = .577 > .05$. Simply put, for the variable of *predicting*, the significance of .029 is below 0.05, so the null hypothesis is refuted, and a significant difference between the variances exists; for the variable *questioning*, the significance of .446 is greater than 0.05, so the null hypothesis is accepted, and a difference between the variances exists; for the variable *clarifying*, the significance of .820 is greater than 0.05, so the null hypothesis is accepted, and no difference between the variances exists; and for the variable *summarizing*, the significance of .577 is greater than 0.05, so the null hypothesis is accepted, and no difference between the variances exists.

Table 10: Levene's Test of Equality of Error Variances^a

	F	df1	df2	Sig.
Question generation	.588	1	58	.446
Clarifying	.052	1	58	.820
Predicting	4.984	1	58	.029
Summarizing	.315	1	58	.577

4.8 Multivariate Normality

The assumption of multivariate normality in the immediate post-test is assessed using skewness and kurtosis. The term "skewness" describes the shape of a distribution curve: asymmetrical or symmetrical. However, the term "kurtosis" describes whether a distribution curve has a pointy or flat middle (Larsen-Hall, 2010). According to George and Mallery (2019), "to demonstrate a normal univariate distribution, values for asymmetry and kurtosis between -2 and +2 are deemed acceptable". Hair *et al.* (2010) and Bryne (2010) advanced that "a data set is regarded as normal if skewness is between -2 and +2 and kurtosis is between -7 and +7". Table 11 presents "the multivariate normality" of the four response variables: questioning, predicting, clarifying, and summarizing. "The multivariate

normality" of the four response variables in both groups is satisfied because the values of the four response variables are between -2 and +2.

Table 11: Multivariate Normality of the Four Dependent Variables in the Post-test

Group		Kurtosis	Skewness
Control	Question generation	-2.127	.141
	Clarifying	-.859	1.006
	Predicting	-1.554	-.745
	Summarizing	-.567	-.404
Experimental	Question generation	-.831	-.240
	Clarifying	-1.636	.344
	Predicting	-.888	-.134
	Summarizing	-.502	.166

We conducted a one-way MANOVA test to verify the hypothesis: *"There will be no difference in the experimental group's performance in the four comprehension-monitoring skills"*. The post-test results revealed a statistically significant MANOVA effect, Wilks' Lambda=.123, $F(4, 55) = 97.60$, $p < .000$ (Table 12). The multivariate effect size was estimated at .877, which means the training explained 87.0% of the difference in the response variables. In sum, the findings revealed that reciprocal teaching has a statistically significant impact on the four monitoring skills of questioning, clarifying, predicting, and summarizing in the post-test. The findings of the qualitative data are discussed in the next section.

Table 12: Multivariate Tests of Statistical Significance

Effect		Value	F	Hypothesis	Error df	Sig.
Intercept	Pillai's Trace	.989	1206.342 ^b	4.000	55.000	.000
	Wilks' Lambda	.011	1206.342 ^b	4.000	55.000	.000
	Hotelling's Trace	87.734	1206.342 ^b	4.000	55.000	.000
	Roy's Largest Root	87.734	1206.342 ^b	4.000	55.000	.000
Group	Pillai's Trace	.877	97.597 ^b	4.000	55.000	.000
	Wilks' Lambda	.123	97.597 ^b	4.000	55.000	.000
	Hotelling's Trace	7.098	97.597 ^b	4.000	55.000	.000
	Roy's Largest Root	7.098	97.597 ^b	4.000	55.000	.000

4.9 The Feedback Questionnaire

The feedback questionnaire served as a tool for evaluating the participants' general perceptions of the study and interpreting the quantitative data. The questionnaire consisted of seven open-ended questions that targeted the participants' overall perceptions of and attitudes towards the execution of reciprocal teaching in teaching reading. The qualitative component of this study added further insights into the researcher's understanding of the topic under investigation. Subjects in the experimental group reported that RT is an effective strategy because it enables them to take control of their learning. The results of the feedback questionnaire, therefore, seem to be in line with the overall findings of the study.

5. Discussion

The findings add to the ongoing discussion about the effectiveness of RT in fostering monitoring skills in different cultural settings. Replicated in an under-researched context, RT enabled Moroccan 2nd-year university students in the experimental group to sustain gains and score higher in clarifying, questioning, summarizing, and predicting. These results align with prior research (e.g., Alsalhi *et al.*, 2024; Chang and Lan, 2021; Doolittle *et al.*, 2006; El Hamydy & Brigui, 2023; Morrison, 2004; Spörer *et al.*, 2009; Yang, 2006).

The use of a quasi-experimental design with a control group and measuring retention over time helped this study to prove the sustainability and effectiveness of RT in the Moroccan EFL context. Additionally, this paper addresses a gap in the literature by assessing the long-term impact of RT on monitoring skills—questioning, predicting, clarifying, and summarizing— among Moroccan EFL university students. The use of Repeated-Measures ANOVA and One-way MANOVA strengthens the study's methodological rigour, allowing for a nuanced understanding of learning gains. Moreover, the feedback questionnaire offers insights into learners' perceptions of RT, contributing to pedagogical discussions on strategy-based reading instruction. Findings from this research can inform EFL instructors, curriculum designers, and policymakers about the potential of RT to enhance reading comprehension skills in similar educational contexts.

Hypothesis 1: Reciprocal teaching will improve EFL college students' comprehension-monitoring skills—clarifying, questioning, predicting, and summarising.

Following the first hypothesis, RT fosters the monitoring skills of Moroccan EFL students in the post-test. The overall findings add to the ongoing discussion about the effectiveness of RT in fostering monitoring skills in different cultural settings (see Tables 15 and 16). These results align with prior research, especially Morrison (2004), who reported a high correlation between comprehension-monitoring and reading proficiency. Based on these results, *hypothesis 1* is accepted, and thus, the study proves the effectiveness of RT in fostering monitoring skills of Moroccan EFL second-year university students.

Hypothesis 2: There will be a significant difference in the experimental group's performance in the four comprehension-monitoring skills.

Following the second hypothesis, it was predicted that the training would influence the performance of the training group on the four monitoring skills. The findings evinced that, owing to reciprocal teaching, subjects in the experimental group scored higher in the skills of clarifying, questioning, summarizing, and predicting in the post-test. However, their performance varied from one skill to another. In principle, if one had to order the investigated four-response variables according to the extent of their impact on the training group's performance in this study, clarifying would be ranked first because most college students scored higher in it ($F(1, 58) = 102.67$; $p < .0005$; partial $\eta^2 = .63$); questioning would be the second skill in which students scored higher ($F(1, 58) =$

116.22; $p < .0005$; partial $\eta^2 = .66$), then summarizing would be the third skill ($F(1, 58) = 80.90$; $p < .0005$; partial $\eta^2 = .58$). Predicting would be ranked last because students scored less in it compared to the other skills ($F(1, 58) = 160.96$; $p < .0005$; partial $\eta^2 = .73$). The overall results, therefore, confirm the hypothesis— *There will be a significant difference in the experimental group's performance in the four monitoring skills*— that was advanced at the beginning.

Hypothesis 3: There will be an effect of the intervention on EFL college students' ability to maintain gains over time.

As for the third hypothesis, it was argued that the intervention would influence EFL college students' ability to maintain gains over time. College students who were exposed to reciprocal teaching maintained their improvement in reading comprehension from post-test to delayed test compared to subjects who received no training. This finding aligns with prior research (e.g., Spörer *et al.*, 2009; Yang, 2006). According to the means scores of the delayed test (i.e., $M = 16.40$, $sd = 1.77$ for the training group and $M = 8.73$, $sd = 1.28$ for the comparison group), the subjects who received reciprocal teaching training outscored those in the comparison group who were taught differently. Inferential statistics also showcased statistically significant effects for *group* in the delayed test, $F(1, 58) = 273.928$, $p < .05$ ($p = .000$, partial eta-squared = .82). The analysis of variance also revealed statistically significant effects for *time* in the delayed test, $F(1.657, 96.099) = 229.298$, $p < .05$ ($p = .000$, partial eta-squared = .80). Additionally, the analysis of variance showed statistically significant effects for *Time X Group* interaction in the delayed post-test, $F(1.657, 96.099) = 305.966$, $p < .05$. ($p = .000$, partial eta-squared = .84). The overall results revealed that RT has a longitudinal impact on the monitoring skills of the subjects. The third hypothesis is thus confirmed.

The findings of the feedback questionnaire support the research question (*What are the perceptions of participants in the experimental group towards the effect of reciprocal teaching on comprehension-monitoring skills?*). Students' perceptions and attitudes were very positive as far as reciprocal teaching is concerned. According to the answers given in the feedback form, all participants seemed to enjoy the reciprocal teaching they received throughout the training. It shows that reciprocal teaching improved the comprehension-monitoring skills of EFL college students. It enabled them to generate questions, clarify and justify some statements, infer words' meanings from context, and summarize the article (s). Hence, the findings of the feedback questionnaire align with the overall results of this study. Additionally, these results align with prior research (e.g., Chang and Lan, 2021; Qutob, 2020).

6. Conclusion

This study examined the impact of Reciprocal Teaching (RT) on fostering monitoring skills—questioning, predicting, clarifying, and summarizing—among Moroccan EFL university students. Using a quasi-experimental design, this paper evaluates the performance of two groups in pre-, post-, and delayed tests. The findings add to the

ongoing discussion about the effectiveness of RT in fostering monitoring skills in different cultural settings. Replicated in an under-researched context, RT enabled Moroccan EFL second-year university students in the experimental group to sustain gains and score higher in clarifying, questioning, summarizing, and predicting. The findings of the feedback questionnaire also aligned with the study's overall results.

5.1 Pedagogical Implications

The results suggest several insightful implications for teachers, trainers, students, and policy experts in an EFL reading setting. Instructors can use reciprocal teaching to adapt and respond to different mixed-ability classes, using strategic modifications that consider varied learning needs and proficiency levels. The use of scaffolding techniques, such as visual aids and bilingual glossaries, does help low achievers keep up the pace with their instructor. Minimizing Teacher-talking Time (TTT) at the expense of Student-talking Time (STT) also enables students to be autonomous in modelling the four comprehension-monitoring skills. Teachers would better differentiate instruction to involve all students in the learning process, irrespective of their learning styles or proficiency levels. Additionally, the integration of digital tools and the execution of rotating roles within small groups can ensure active participation of learners (Malmous & Zaidoune, 2025). Besides that, topic familiarity and the use of students' L1 for preliminary discussions can foster students' reading comprehension. Hence, teachers can use familiar and simplified texts with beginners to model the skills of questioning and predicting, and they can utilize academic challenging texts with higher achievers to engage them in debates and discussions. By implementing these implications, teachers can employ RT in different EFL contexts to foster reading proficiency among learners of diverse backgrounds and levels.

5.2 Limitations

The present study is not immune to the drawbacks of the quasi-experimental design. One of them is that there is no random selection because participants were neither randomly assigned nor selected. Another limitation is the small sample size; 60 participants took part in this study. Besides that, one level was involved; second-year university students took part in this longitudinal study. For this reason, the results cannot be generalized; therefore, they are open to debate. These limitations affect the interpretation of the findings.

Future Research Suggestions

Future research could investigate the effect of reciprocal teaching on other skills, especially listening. It could also examine the use of reciprocal teaching in mixed-ability classrooms or the application of RT in digital learning environments.

Funding Statement

This research is not funded.

Authenticity Statement

This manuscript is an original work.

Artificial Intelligence Statement

AI and AI-assisted technologies were not used.

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Conflict of Interest Statement

The author declares no conflicts of interest.

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