Is questioning a catalyst for critical reading among Jordanian EFL learners?[†]

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Abstract

This study examines the potential effect of questioning strategies on Jordanian English as a foreign language ninth-grade students' critical reading skills. The study uses a quasi-experimental, pre-/post-test design. An experimental group of 85 ninth-grade students from three public schools in Al-Qasr Directorate of Education (Karak, Jordan) was taught through questioning strategies (viz., questioning, self-questioning and a combination of both), and a control group of 19 students was taught per the guidelines of the prescribed Teacher's Book. Descriptive statistics and analysis of co-variance were used to analyse the students' scores on the pre- and post-tests. The findings reveal that the experimental group outperformed the control group, as questioning and self-questioning improved students' critical reading skills, more so for questioning than self-questioning.

Keywords: Critical reading, EFL, Jordan, questioning, self-questioning, strategies.

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1. Introduction

Critical reading is instrumental for academic success. Teaching to think, question, read and write critically is one of the challenges of the new millennium (Crismore, 2000) as learners are expected to read beyond the author's words into their intended meaning and beyond it. Critical readers are believed to develop into problem solvers (Combs, 1992) by constantly questioning what they read, distinguishing fact from opinion and making inferences about the meaning of the text (Kurland, 2000; Rayan, 2011; Shulman, 2004; Taglieber, 2000).

Critical reading, also known as active or close reading, has been defined as a process in which higher order skills are used for actively analysing, interpreting and evaluating text (Akin, Koray & Tavukcu, 2014; Ates, 2013; Criscuolo, 1965; Flynn, 1989; Kadir, Subki, Jamal & Ismail, 2014; Paul & Elder, 2008; Zabihi & Prodel, 2011) and arriving at conclusions based on evidence (Carr, 1988; Zintz & Maggart, 1984). *Analysis* involves the clarification of information by examining its constituents, whereas *synthesis* and *evaluation* entail combining relevant parts into a coherent whole and judging ideas against established standards to verify their reasonableness, respectively (Flynn, 1989; Taglieber, 2000).

Questioning is more an acquired ability than an innate quality (Mucher, 2007). Questioning entails the use of questions as instructional cues which convey to students the content to be learned and instructions as to what they are expected to do and how to go about doing it (Cotton, 2001). It is a powerful tool in teaching and learning, as thinking is driven by questions rather than by answers. Elder and Paul (1998, p. 297) maintain that

> [q]uestions define tasks, express problems and delineate issues. Answers, on the other hand, often signal a full stop in thinking. Only when an answer generates a further question does thought continues its life as such. That is why it is true that only students who have questions are really thinking and learning.

Self-questioning, defined as an ongoing process in which the reader asks questions to better understand a text, entails monitoring one's own reading comprehension through a series of questions that are either self-generated and/or teacher-prepared. However, students have been reported to ask few questions, fewer in real pursuit of knowledge and even fewer higher-order questions (Almeida, 2012).

This research examines three types of questioning strategies: questioning, self-questioning and a combination of the two. *Questioning* entails that the teacher asks high-order questions to improve students' critical reading skills (e.g., *why does the author say so? What is the purpose? Informing, persuading?*). On the other hand, *self-questioning* entails the students' use of text content to generate high-order questions (e.g., *what is the hidden message in this story? What or who is the passage about?*). Students also use a combination of *teacher-driven questioning* and *self-questioning* as potential catalysts for critical reading.

Research suggests that students who are taught self-questioning read better than those who are not (e.g., Kamalizad & Jalilzadehb, 2011; Pearson, Roehler, Dole & Duffy, 1992). Self-questioning has also been reported as a catalyst for reading comprehension, inquiry and independent learning across grade and proficiency levels (Almeida, 2010; 2012; Rosenshine, Meister & Chapman, 1996). In their review of 35 studies on the effects of self-questioning on K-12 students' reading comprehension, Joseph, Alber-Morgan, Cullen and Rouse (2015) reported positive effects on reading comprehension among learners from various educational settings. However, Joseph et al. were reportedly unable to conclude that self-questioning was effective for critical reading.

Critical readers constantly ask questions about the text they are reading (Roe, Stoodt & Burns, 2007), which is probably why teachers have long used questioning to improve students' general and

critical reading skills (Shang & Chien, 2010; Sunggingwati & Nguyen, 2013). In teaching questioning, teachers must first demonstrate how questions foster comprehension and, second, make sure that students ask appropriate questions to achieve comprehension (Hervey, 2006). However, research (e.g., Cook, 1991, p. 23) suggests that if teachers do not learn to see reading as a thinking process, they 'will never be able to read critically or teach others to do so'.

To become a critical reader, one should learn to interact with the text. To this end, research (e.g., Kurland, 2000; Toh, 2011) puts forth a host of measures, most important among which is targeting texts whose topics are relevant and interesting to the readers who should be trained to read critically by, among other measures, the provision of open-ended questions to evaluate themselves and hone their skill. To this end, Zemliansky (2008, p. 1) maintains that critical reading is

> a liberating practice because you do not have to worry about 'getting it right'. As long as you make an effort to engage with the text and as long as you are willing to work hard on creating a meaning out of what you read, the interpretation of the text you are working with will be valid.

Critical reading shares a lot of the attributes of critical thinking, so much so that what is said about one may readily be said about the other. Critical thinking skills (e.g., questioning, inferencing, predicting, recognising bias) are similar, if not identical, to those described as critical reading skills (Sherbourne, l981; Thistlethwaite, 1990). In other words, reading critically goes beyond reading for understanding textual facts to understanding the writer's purpose, potential bias and argumentation.

1.1. Problem, purpose and questions of the study

Most students, ESL/English as a foreign language (EFL) and otherwise, struggle with critical reading (Crismore, 2000; Kadir et al., 2014), as teachers focus more on word attack, comprehension and fluency skills than on critical reading (Hudson, 2007; Kadir et al., 2014). Consequently, these students are potentially denied schooling opportunities for thinking and reading critically to, eventually, graduate college and enter the labour market unable to 'understand instructions, … select or apply criteria to evaluate the best solution for simple problems, or … even ask intelligent questions' (Crismore, 2000, p. 3).

As seasoned EFL practitioners, the researchers have noticed that their students have difficulties in reading beyond the text and identifying the author's purpose, which has been corroborated by previous findings that teaching English in the public Jordanian schools does not lead students to read critically (e.g., Khader, 2002). Traditionally, the reading lesson is set in distinct procedures through which students read a text, give the meaning of new vocabulary and answer comprehension questions. These questions usually promote simple recall and comprehension rather than analysis, synthesis or evaluation of the text content (Al-Damiree & Bataineh, 2016).

Research also suggests that Jordanian EFL learners experience difficulty in general and critical reading alike (e.g., Al-Barakat & Bataineh, 2008; 2011; Al-Rabadi & Bataineh, 2015; Bataineh & Alqatanani, 2017; Bataineh, Al-Rabadi & Smadi, 2013; Bataineh & Al-Shorman, 2005; Bataineh & Zghoul, 2006), which is often attributed to the inflexibility and absence of innovative instructional practices (Alwaeli & Abu-Alruz, 2011) as students are usually taught to answer rather than ask questions. Similar results are reported for Libyan EFL students (Albeckay, 2014) who were found to draw on their first language to support their reading in the foreign language for lack of prior instruction or practice in critical reading. To enable learners to become critical readers, they should be provided with a set of empirically tested strategies such as generating and answering questions, making inferences and analysing and evaluating texts (Pearson, 1985).

This study aims to examine the potential effect of questioning strategies on Jordanian ninth-grade students' critical reading. More specifically, it seeks to answer the following questions:

1. What is the effect of questioning strategies on Jordanian ninth-grade students' critical reading skills of analysis, synthesis and evaluation?
2. Are there any statistically significant differences (at α = 0.05) in the participants' critical reading skills, which may be attributed to instruction (conventional vs. questioning-based)?

1.2. Significance of the study

An extensive review of the literature on questioning strategies has produced a plethora of foreign research (e.g., Akkaya & Demirel, 2012; Keeley, Ali & Gebing, 1998; Miciano, 2004) and relatively little local research (e.g., Al-Qatawneh, 2007; Al-Shiekh, 2010; Khader, 2002) on the use of questioning strategies in the EFL language classroom. Thus, this study may well be the first to examine the potential effectiveness of questioning and self-questioning strategies on critical reading in the Jordanian EFL classroom.

The study may also raise awareness of the potential utility of higher order questions in language education among teachers, curriculum designers and other educational practitioners. Language learners' engagement in learning improves as they analyse, interpret, evaluate and discuss what they read and ask and answer questions about it, which may culminate in an improved command of the language itself.

2. Previous research

Despite a plethora of research on reading in the Jordanian EFL context (e.g., Al-Damiree & Bataineh, 2016; Bataineh & Al-Barakat, 2005; 2009; Bataineh & Alqatanani, 2017; Bataineh & Zghoul, 2006), an extensive review of related literature has revealed a dearth of local and, to a lesser extent, international empirical research on the effect of questioning strategies on EFL learners' critical reading. To the best of these researchers' knowledge, the current study is one of the first attempts to examine the potential effect of questioning strategies on Jordanian students' critical reading skills.

Miciano (2004) trained 66 college students from two Developmental Reading classes in question-formulation and then asked them to ask questions on four reading texts. He reported that even though the students were found proficient in reading for details (viz., asking recognition and retrieval questions), they were poor in critical reading (viz., reading for the main idea and, more so, higher level processing).

Al-Shiekh (2010) examined the effect of self-questioning on reading comprehension and meta-cognitive thinking skills of 242 Jordanian secondary-stage students. Significant differences in both reading comprehension and meta-cognitive skills were reported.

Similarly, Dorkchandra (2013) examined the effect of question-generating on 40 Thai EFL students' reading comprehension and tense usage. The results indicated that question-generating strategy instruction helped students to both improve their reading comprehension level and use of English grammatical tenses.

Coutinho and Almeida (2014) analysed 18 ninth-grade students' written questions to assess the cognitive level (viz., closed *vs.* open) and the functions (viz., knowledge, understanding, relationship, evaluation and finding a solution) of these questions, using observation. The findings showed no close relationship between the function and cognitive level of the questions although fewer closed than open questions were asked throughout.

Karadag (2014) interviewed 25 Turkish student-teachers of primary education to identify their views about and their perceived competence in critical reading. The findings revealed that the respondents considered themselves neither critically literate nor aware of critical reading strategies, which they attributed to insufficient teacher education.

Davoudi and Sadeghi (2015) reviewed the findings of 100 studies on teacher and student questioning behaviour over four decades (1974–2014). The findings reiterated the paramount utility of questioning in facilitating critical thinking, reading, writing, subject matter learning, meta-cognitive skills and scaffolding learning.

Nasrollahi, Krishnasamy and Noor (2015) examined Iranian EFL students' critical reading strategies using observation and interview. They reported that even though their students were generally familiar with reading strategies, these strategies are presented in isolation and seldom practiced in the Iranian high school classroom. More relevant to the current research, Nasrollahi *et al*. reported that the most prominent critical reading strategies observed are skimming, scanning, asking questions and taking notes.

Dos et al. (2016) analysed 170 Turkish primary school teachers' questioning strategies, using a semi-structured questionnaire and content analysis. Relevant to the purposes of the current research, they reported that teachers asked divergent questions more to the entire class than individual students and that questions mainly sought to uncover operational knowledge much more than metacognitive knowledge.

Bulut (2017) examined the effect of SQ3R on seven Turkish struggling fourth-grade students' reading comprehension, using teacher diaries, a reading comprehension test, a student interview schedule and a student observation schedule. The results revealed that the SQ3R-based reading treatment improved not only the students' reading comprehension but also their ability to analyse texts and their predictive and note-taking skills.

As the current research examines the potential effect of using questioning, self-questioning and a combination of the two on ninth-grade students' critical reading skills of *analysis, synthesis* and *evaluation*, it is hoped to either corroborate or provide counter-evidence to previous research findings on the relationship between questioning and critical reading in the foreign language classroom.

3. Method and procedures

This study is quasi-experimental in design. Four intact ninth-grade sections of 85 students were purposefully drawn from Al-Qasr secondary school (Karak, Jordan) and randomly divided (through a coin toss) into a control group and three experimental groups. The control group (n = 17) was taught per the guidelines of the Ministry-prescribed Teacher's Book whereas the three experimental groups (n = 19, 19, 30) were taught through three variations of questioning-based instruction: questioning, self-questioning and a combination of both, respectively.

Based on their collective experience and a thorough review of the literature, the researchers designed training for the participating teachers and redesigned the instructional content for students per questioning strategies. Pre- and post-tests were also designed to collect data from the students.

The researchers designed a four-day programme of 16 training hours for the teachers who taught the experimental groups on implementing the questioning strategies prior to the intervention. The programme involved hands-on practice on topics such as types of questions, effective questioning strategies for reading instruction, questioning strategies for critical reading and micro-teaching and self-reflection on lessons from the prescribed textbook, *Action Pack 9.* A manual was prepared for the teachers of the experimental groups on the use of questioning and self-questioning strategies to foster critical reading skills (viz., *analysis, synthesis* and *evaluation*).

The pre-/post-test was designed to assess the students' ability to read critically. It consisted of two reading passages, one with five multiple-choice and three constructed-response questions and the other with ten multiple-choice and one constructed-response questions. The participants were allowed 90 minutes to complete the test which was scored out of 50. The four groups were tested immediately before and after the intervention.

The validity of the training material, instructional content and pre-/post-tests was established by an expert jury of 10 Jordanian university professors in foreign language teaching, curriculum and instruction, and measurement and evaluation whose recommendations were used to amend these documents. The reliability of the pre- and the post-tests was established by piloting them on 17 ninth-grade students, who were excluded from the sample, with a 2-week interval between the two administrations. The reliability coefficient amounted to 0.86, which is considered appropriate for the purposes of this research.

Between the pre- and post-tests, the control group was taught the content of three modules from the prescribed textbook, *Action Pack 9,* per the guidelines of the Teacher's Book whereas the three experimental groups were taught the same content which was redesigned to involve high-order questioning per the strategies of questioning, self-questioning and a combination of the two. Each of the three modules consisted of two reading passages which were redesigned per questioning-based instruction. The treatment spanned an 8-week interim with five 40-minute sessions per week.

3.1. Instructing the groups

3.1.1. The control group
The control group was taught per the following procedures:

1. The teacher initiated the lesson by asking general (mainly yes/no) questions about the general topic of the passage (from the text, pictures and illustrations) which the students answered and whose answers she wrote on the board.
2. Four types of questions were asked on each of the passages targeted in the study (viz., determining whether statements are true or false, answering comprehension questions, reordering events and identifying pronominal references).
3. The teacher read each question with the class and explained its requirements (e.g., identifying pronominal references of words in bold-type).
4. The students answered the questions with the teacher's help.
5. The teacher asked students to find the meaning of the new vocabulary, which precedes the passage, in the glossary in their activity book.
6. Only the teacher asked questions with occasional questions from the students, both based exclusively on the passage under question.
7. The students read the passages silently and then aloud.
8. The students did the exercises following each passage (e.g., reordering events) under the supervision of the teacher.

3.1.2. Experimental group 1: questioning strategy
The questioning group was taught per the following procedures:

1. At the onset of the treatment, the teacher distributed worksheets about questioning strategy, levels of questions per Bloom's Taxonomy and the potential utility of questioning for reading.
2. For each of the six reading passages under study, the teacher posed questions for individual students to ponder the title of the passage and examine the key vocabulary in it.
3. The students collaborated to fill in concept maps (affixed to the board) with clues from the pictures, headings and the text itself.

4. The students were divided into small groups to answer analysis, synthesis and evaluation questions (e.g. after they read, *if you are good at drawing, you will cover the walls of your cave with paintings of your hands* in a passage, they were asked to ponder the statement and justify the author's idea).
5. Each group shared their answers with the entire class.

3.1.3. Experimental group 2: self-questioning strategy
The self-questioning group was taught per the following procedures:

1. At the beginning of the treatment, the teacher distributed worksheets about self-questioning strategy, levels of questions per Bloom's Taxonomy and the potential utility of questioning for reading.
2. The teacher demonstrated self-questioning by engaging in a think-aloud over the title of a sample reading passage (e.g., How did the people in the past communicate with each other? Why is communication important for humans?) after which she jotted down notes in the margins of her textbook.
3. The teacher read the passage aloud and asked herself some questions (e.g., When did the postal service begin? How has written communication improved human civilisation?).
4. As she read aloud, the teacher demonstrated how some of her predictions were right and others wrong and how to adjust these predictions based on the text, constantly making annotations in the margins of her textbook and drawing students' attention to how she would need to remember her questions to find answers for them as she read the text.
5. For each of the six reading passages under study, the teacher asked students to write questions for the author to answer to help them better understand the text.
6. The students shared questions (from their notes) and brainstormed more with the rest of the class and filled in concept maps (affixed to the board) with clues from the pictures, the headings and the text itself.
7. The students were also asked to fill a KWL chart with the information they knew and what they want to know about the passage (e.g., Hieroglyphics).
8. The students discussed their questions in pairs and then shared them with the entire class.
9. The students watched a YouTube video and, in small groups, wrote a minimum of two questions each for the speaker in the video.
10. The groups exchanged their questions, and a class discussion ensued.

3.1.4. Experimental group 3: questioning and self-questioning combined
The questioning and self-questioning group was taught per the following procedures:

1. At the onset of the treatment, the teacher distributed worksheets about questioning, self-questioning, levels of questions per Bloom's Taxonomy and the potential utility of questioning for reading.
2. A combination of questioning and self-questioning was taught through six reading passages from *Action Pack 9.*
3. The teacher demonstrated self-questioning by engaging in a think-aloud over the title of a sample reading passage (e.g., How did the people in the past communicate with each other? Why is communication important for humans?) after which she jotted down notes in the margins of her textbook.
4. For each of the six reading passages under study, the teacher both prepared questions to brainstorm students' ideas about the passage (e.g., What does cave painting mean? What kind of communication do I prefer to use? How shall I send a letter? How can I communicate with other people 3,000 years ago? What is written communication?) and asked students to write questions for the author of the passage to better understand the text.

5. The teacher demonstrated using questions prompts with the whole group (e.g., I am going to ask you a question. Listen and get ready to answer. You have 1 minute to do so).
6. Students worked in pairs to write two wh-questions about the passage**.**
7. Students read the article individually to first highlight and then write the main idea for each paragraph in one sentence (summary practice).
8. In pairs, students compared and reviewed their summaries, after which the teacher guided class discussion with questions (e.g., Do you think people will invent a new writing system in the future?).
9. Students read the passage and wrote three questions each as they read. They discussed their questions in pairs before sharing them with the class to answer them together (think-pair-share).
10. The teacher demonstrated filling the question web with two questions (e.g*.,* Why did the crew report its progress to the organisers twice a day?) before asking individual students to fill more question webs as they read the article (question web).
11. Students shared their questions and answers, and class discussion ensued.

4. Findings and discussion

4.1. The first research question

The first question sought to determine the potential effect of questioning strategies on the students' critical reading skills. To answer it, means and standard deviations were calculated for the students' scores on the pre- and post-tests for the control group and the three experimental groups, as shown in Table 1.

Table 1: Means and standard deviations of the students' pre- and post-test scores per strategy and sub-skill

Group	Sub-skill	n	Pre-test		Post-test		Adjuste d mean	Std. error
			Mean	SD	Mean	SD		
	Analysis		6.22	2.80	12.23	3.36	12.84	0.81
Control	Synthesis	17	1.58	2.13	3.85	2.38	4.46	0.52
	Evaluation		3.23	2.40	6.26	2.76	6.93	0.55
	Analysis		6.44	3.11	19.07	2.63	18.46	0.78
Questioning	Synthesis	19	4.02	2.80	6.42	2.62	5.82	0.50
	Evaluation		4.92	2.75	6.60	2.03	5.89	0.53
	Analysis		7.47	4.28	15.10	4.95	14.79	0.76
Self-questioning	Synthesis	19	3.05	2.85	7.63	2.59	7.42	0.49
	Evaluation		4.55	2.73	6.78	2.00	6.52	0.51
Questioning and self-questioning	Analysis	30	6.98	3.11	15.35	3.17	15.59	0.61
	Synthesis		2.41	2.65	6.43	2.50	6.59	0.39
	Evaluation		3.06	3.27	7.53	3.25	7.77	0.41

Table 1 shows observed differences among the pre- and post-test mean and adjusted mean scores of the control and experimental groups on the three critical reading skills of *analysis, synthesis* and *evaluation*. However, even though both modes of instruction (conventional and questioning-based)

seem to have contributed to learning, the experimental groups apparently improved more substantially (as can be gleaned from the post-test scores).

To determine the potential statistical significance (at α = 0.05) of the differences among the adjusted mean scores of the control and experimental groups on the post-test, one-way analysis of co-variance (ANCOVA) was calculated (excluding the pre-test), as shown in Table 2.

Table 2. ANCOVA of the control and experimental groups' scores on the post-test per subskill

All groups	Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Analysis	Way	270.483	3	90.161	8321	0.000*	.242
	Error	845.161	78	10.835			
	Corrected Total	1467.747	84				
Synthesis	Way	84.389	3	28.130	6189	0.001*	.192
	Error	354.530	78	4.545			
	Corrected Total	652.924	84				
Evaluation	Way	40.453	3	13.484	2706	0.05*	.094
	Error	388.613	78	4.982			
	Corrected Total	611.247	84				

*Statistically significant at (α = 0.05).

Table 2 shows statistically significant differences (at α = 0.05) in the students' post-test scores on all three sub-skills. To identify the favourability of the differences, dual comparisons were made among the groups, as shown in Table 3.

Table 3. ANCOVA of the control and experimental groups' students' post-test scores on the three sub-skills

Group	Sub-skill	Source	Sum of squares	df	Mean squares	F	Sig.	Partial Eta squared
Control and *Questioning*	Analysis	Way	265.897	1	265.897	30.881	0.000*	0.499
		Error	266.923	31	8.610			
		Corrected Total	726.410	35				
	Synthesis	Way	9.212	1	9.212	2471	0.126	0.074
		Error	115.597	31	3.729			
		Corrected Total	274.188	35				
	Evaluation	Way	5.551	1	5.551	1495	0.231	0.046
		Error	115.059	31	3.712			
		Corrected Total	197.889	35				
Control and Self-Questioning	Analysis	Way	19.080	1	19.080	1279	0.267	0.040
		Error	462.603	31	14.923			
		Corrected Total	696.750	35				
	Synthesis	Way	71.246	1	71.246	14.264	0.001*	0.315
		Error	154.845	31	4.995			
		Corrected Total	340.410	35				
	Evaluation	Way	1.623	1	1.623	382	0.541	0.012
		Error	131.794	31	4.251			
		Corrected Total	212.188	35				
Control and Questioning and	Analysis	Way	70.268	1	70.268	7675	0.008	0.155
		Error	384.509	42	9.155			

Group	Sub-skill	Source						
Self-Questioning (Combined)		Corrected Total	577.904	46				
	Synthesis	Way	46.004	1	46.004	9266	0.004*	0.181
		Error	208.535	42	4.965			
		Corrected Total	344.500	46				
	Evaluation	Way	5.867	1	5.867	.855	0.360	0.020
		Error	288.270	42	6.864			
		Corrected Total	446.489	46				
	Analysis	Way	132.174	1	132.174	10.327	0.003*	0.238
		Error	422.355	33	12.799			
		Corrected Total	716.928	37				
Questioning and Self-Questioning	Synthesis	Way	26.002	1	26.002	6170	0.018	0.158
		Error	139.072	33	4.214			
		Corrected Total	259.474	37				
	Evaluation	Way	1.782	1	1.782	650	0.426	0.019
		Error	90.518	33	2.743			
		Corrected Total	161.770	37				
	Analysis	Way	70.849	1	70.849	9431	0.004*	0.177
		Error	330.547	44	7.512			
		Corrected Total	578.459	48				
Questioning and Questioning and Self-Questioning (Combined)	Synthesis	Way	8.770	1	8.770	2018	0.163	0.044
		Error	191.249	44	4.347			
		Corrected Total	305.500	48				
	Evaluation	Way	39.118	1	39.118	7240	0.010	0.141
		Error	237.742	44	5.403			
		Corrected Total	390.776	48				
	Analysis	Way	5.989	1	5.989	.514	0.477	0.012
		Error	512.862	44	11.656			
		Corrected Total	734.061	48				
Self-Questioning and Questioning and Self-Questioning (Combined)	Synthesis	Way	7.883	1	7.883	1524	0.224	0.033
		Error	227.641	44	5.174			
		Corrected Total	319.490	48				
	Evaluation	Way	14.987	1	14.987	2518	0.120	0.054
		Error	261.849	44	5.951			
		Corrected Total	400.061	48				

Table 3 shows statistically significant differences (at α = 0.05) in the students' post-test scores between the control group and the questioning group in favour of the latter in the *analysis* sub-skill, and between the control group and the self-questioning group in favour of the latter in *synthesis*. Table 3 also shows statistically significant differences (at α = 0.05) between the control group and the questioning and self-questioning group on both *analysis* and *synthesis*, in favour of the latter and between the questioning and the self-questioning groups on *analysis*, in favour of former and on *synthesis* in favour of the latter.

Table 3 further shows statistically significant differences (at α = 0.05) between the questioning and questioning and self-questioning groups on *analysis* in favour of the former and in *evaluation* in favour of the latter. These differences are further detailed in Table 4.

Table 4. Comparisons among the groups by sub-skill and instructional treatment

Group	Skill	Control			Questioning			Self-Questioning			Questioning & Self-Questioning		
		A	S	E	A	S	E	A	S	E	A	S	E
Control	Analysis				−5.62*			−1.95			−2.75*		
	Synthesis				−1.36				−2.96*			−2.13*	
	Evaluation						1.04			0.41			−0.84
Questioning	Analysis	5.62*						3.67*			2.87*		
	Synthesis		1.36						−1.6*			−0.77	
	Evaluation			−1.04						−0.63			-1.88*
Self-Questioning	Analysis	1.95			−3.67*						−0.8		
	Synthesis		2.96*		1.6*							0.83	
	Evaluation			−0.41		0.63							−1.25
Questioning & Self-Questioning	Analysis	2.75*			−2.87*			0.8					
	Synthesis		2.13*		0.77				.83				
	Evaluation			0.84		1.88*			1.25				

Table 4 shows statistically significant differences (at *α* = 0.05) in the *analysis* sub-skill between the control group and the questioning group in favour of the latter and in *analysis* between the questioning group and the self-questioning group in favour of the former. Table 4 further shows statistically significant differences between the questioning group and the questioning and self-questioning group in *analysis* in favour of the former, between the self-questioning group and control group in *synthesis* in favour of the latter, and between the questioning group and the self-questioning group in *synthesis* in favour of the latter. Statistically significant differences are also evident between the questioning and self-questioning group and the control group in *analysis* in favour of the former, between the questioning and self-questioning group and the control group in *synthesis* in favour of the latter, and between the questioning group and the questioning and self-questioning group in *evaluation* in favour of the latter.

The findings reveal statistically significant differences in the participants' critical reading pre- and post-test scores across the four groups, in favour of the three experimental groups and within the three groups themselves. The superiority of the experimental groups may be readily attributed to the questioning-based treatment in which the participants were allowed opportunities to experience higher-order questioning by teachers who were trained to engage them in critical reading skills through questioning.

These researchers noticed how the participants struggled at the onset of the treatment. The novelty of the treatment flustered them at first but, as the treatment progressed, they became accustomed to the questioning strategies and began to actively engage in the activities.

These findings are consistent with those which suggest that practice positively affects critical reading (e.g., Albeckay, 2014) and those which report that questioning develops critical reading (e.g., Al-Qatawneh, 2007; Al-Shiekh, 2010; Keeley, Ali & Gebing, 1998; Shang & Chien, 2010; Seker & Komur, 2008), as both promote interaction and actively engage learners.

4.2. The second research question

The second research question addresses potentially statistically significant differences (at α = 0.05) in critical reading skills which may be attributed to the mode of instruction. To this end, calculations were made for the control and three experimental groups, as shown in Table 5.

Table 5. Means and standard deviations of the students' pre- and post-test scores per group

Group	n	pre-Mean	SD	Post-Mean	SD	Adjusted mean	Std. error
Control	17	11.05	5.16	22.35	6.38	23.75	1.50
Questioning	19	15.39	6.88	32.10	5.65	30.92	1.41
Self-Questioning	19	15.07	7.71	29.52	8.81	28.53	1.41
Questioning and Self-Questioning	30	12.45	7.68	29.28	7.89	29.86	1.12

Table 5 shows observed differences among the pre-test mean scores of the control and experimental groups and in their adjusted mean scores on the post-test. To determine the potential statistical significance of the differences in the students' post-test scores, ANCOVA was used (excluding the pre-test), as shown in Table 6.

Table 6. ANCOVA of the students' post-test scores across the four groups

Source	Sum of squares	df	Mean squares	F	Sig.	Partial Eta squared
Way	535.29	3	178.43	4.77	0.004*	0.15
error	2989.10	80	37.36			
Corrected total	5361.42	84				

*Statistically significant at (α = 0.05).

Table 6 shows statistically significant differences (at α = 0.05) in the students' post-test scores. To identify the favourability of the differences, dual comparisons were made among the four groups, as shown in Table 7.

Table 7. Comparisons among the groups by instructional treatment

Group	Source	Sum of squares	Df	Mean squares	F	Sig.	Partial Eta squared
Control and *Questioning*	Way	401.87	1	401.87			
	Error	755.04	33	22.88	17.56	0.000*	0.34
	Corrected Total	2,080.50	35				
Control and Self-Questioning	Way	147.58	1	147.58			
	Error	1,256.88	33	38.08	3.87	0.057	0.105
	Corrected Total	2,513.30	35				

Control and Questioning and Self-Questioning	Way	409.61	1	409.61			
	Error	1,827.22	44	41.52	9.86	0.003*	0.18
	Corrected Total	2,981.40	46				
Questioning and Self-Questioning	Way	53.43	1	53.43			
	Error	1,149.47	35	32.84	1.62	0.210	0.04
	Corrected Total	2,037.21	37				
Questioning and Questioning and Self-Questioning	Way	18.72	1	18.72			
	Error	1,690.93	46	36.75	0.50	0.47	0.01
	Corrected Total	2,475.26	48				
Self-Questioning and Questioning and Self-Questioning	Way	19.42	1	19.42			
	Error	2,233.83	46	48.56	0.40	0.53	0.009
	Corrected Total	3,207.76	48				

Table 7 shows statistically significant differences in favour of the three questioning groups over the control group. However, no statistically significant differences are found among the other groups, as detailed in Table 8.

Table 8. Comparisons among the four groups on the post-test

Groups	Control	Questioning	Self-Questioning	Questioning and Self-Questioning
Control	--	−7.17*	−4.78*	−6.11*
Questioning	7.17*	--	2.39	1.06
Self-Questioning	4.78*	−2.39	--	−1.33
Questioning and Self-Questioning	6.11*	−1.06	1.33	--

*Statistically significant at (α = 0.05).

Table 8 shows statistically significant differences in the students' critical reading in favour of the three questioning groups. Questioning seems to have improved the students' critical reading skills of *analysis, synthesis* and *evaluation* alike, more so for questioning than self-questioning and questioning and self-questioning combined.

To begin with, no significant differences in the students' critical reading were detected on the pre-test, which is readily explained by the fact that none of the four groups had received any prior instruction in critical reading prior to the treatment. However, following the treatment, the experimental groups outperformed the control group, which may be attributed to questioning-based instruction. The questioning group consistently outperformed the other groups, which may be attributed to the long-standing tradition of teacher-posed questions in the language classroom. By contrast, the novelty of self-questioning, at least for this group of learners, may have detracted from

its effectiveness, as students were neither as cognisant nor as comfortable with self-questioning as they are with questioning.

Not only were the participants, who are customarily recipients of teacher input, essentially unfamiliar with higher order questioning, but they had also not reached a level where they could independently engage in self-questioning. The novelty of the strategy may have limited its utility, as the participants struggled not only to engage in the strategy but also to make headway as actively engaged critical readers.

5. Conclusions and recommendations

Questioning has been both extensively used and heavily researched, with reports that questioning is a strategy second only to lecturing. Research reports that teachers spend an average of 35% to 50% of their class time asking questions (e.g., Cotton, 1989; Graesser & Person, 1994). Research also suggests that teacher-dominated questioning patterns have persisted over time (e.g., Almeida and Neri de Souza, 2010), and that to the teacher's average 300 to 400 questions a day, a student may ask an average of one question a week (Graesser & Person, 1994).

The literature provides substantial evidence that teachers typically use lower order (viz., knowledge, comprehension and application) over higher order questions (viz., *analysis, synthesis* and *evaluation*) from primary to tertiary education. Nevertheless, evidence abounds that questioning, more so for higher order questioning, is instrumental for learning, as learners relate new information to their background knowledge to make better sense of it.

The current findings, which reveal that questioning-based instruction improves students' critical reading skills, more so for questioning than self-questioning, have given rise to several recommendations for teachers and future researchers. Teachers are called upon not only to make use of questioning but also to opt more for high-order questions than mere recall and lower order questions. They are also urged to enrol in in-service professional development workshops which potentially keep them abreast with innovative teaching/learning strategies related not only to questioning but also to other aspects of language teaching and learning.

The relatively small sample size potentially limits the generalisability of the findings, but they are nonetheless sound and indicative of the realities of the Jordanian EFL classroom. Similar research encompassing larger samples, other language skills (e.g., listening, writing), and other grade levels may corroborate these findings and improve their generalisability.

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