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Green English Language Teaching Approach to Develop Critical Reading Skills and Environmental Awareness among Secondary School Students for Girls

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Abstract

The present study examined the effect of using green English pedagogy to develop critical reading skills and environmental awareness among secondary school students for girls. Sixty Jordanian grade 9 EFL students participated in the present study. They were enrolled in the Serfa secondary school for girls, education directorate of Lwa'a Al-Qasr. The participants were assigned as control and experimental groups. The elicitation of data relied on three instruments, namely critical reading test, perception questionnaire and environmental awareness checklist. The current study employed pre-and-posttest research design. It made use of the mixed method in analyzing the collected data both quantitatively and qualitatively. The findings indicated that green English instruction positively helped to develop the critical reading skills of Jordanian EFL grade 9 students. The present study recommended that curriculum planning and design of English syllabi for Jordanian secondary school should incorporate green English-based learning materials and should train Jordanian EFL teachers to employ the green English instruction with the classroom parameters.

Keywords: green English, critical reading skills, environmental awareness, secondary schools, Jordanian EFL students.

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1-Introduction:

There have been recent calls to integrate environment conservation into the utilized English language instruction. The combination between these two concepts results in what is currently termed as green English. Environmentally focused English instruction within this philosophy of instruction is conceptualized as a learning factor and a teaching component that connects environmental information with the results of English language learning, and critical reading skills and environmental awareness are conceptualized as educational components that are expected to develop through this integration.

Stibbe (2021) pointed out that the green English concept has revolutionized the pedagogy of FL teaching. It highlights the necessity of emphasizing the need for environment conservation within the goals of TEFL process. It spurs EFL learners to be friendly oriented in protecting the environment, able to critically discuss and analyze environmental issues. Green English instruction is designed to be a pedagogical instrument that simultaneously treats linguistic development and environmental awareness, with critical reading skills being a cognitive and linguistic outcome derived from texts and activities focused on the environment.

Environmental awareness, from a perspective of a variable, is a behavioral dependent variable that reflects the knowledge, attitudes, and responsible behaviors of the learners which are expected to continue to evolve with consistent use of green English learning practices. Through green English instruction students can increase their environmental consciousness.

In this study, critical reading skills are a dependent variable influenced by of linguistic aptitudes (lexis, grammar, sentence patterns, and syntactic constituents) as

well as higher-order cognitive aptitudes (analysis, evaluation, synthesis, inference and application), hypothesized to be influenced by the use of green English instruction. Learners should have adequate linguistic knowledge to be able to interact efficiently with the reading texts and perform critical reading activities. Jia and Guo (2024) explained that the complex interaction between learners and reading texts entails knowledge of lexis, grammar, structure, sentence patterns and syntactic constituents used in formulating sentences. These linguistic components are presented in this study as sub-components measurable of the dependent variable of critical reading skills. Learners should be able to evaluate, analyze and apply the read information through argument and opinion expression.

Kose and Gunes (2021) clarified that in spite of benefits related to the application of critical reading strategies compared to the regular reading strategies, they still constitute a challenge for EFL learners who find it difficult to fully attain these strategies. Critical reading strategies urge learners to employ cognitive skills in accordance to Bloom's knowledge scale of evaluating, analyzing, and applying knowledge. The purpose of this research study is to assert that green English instruction offers an instructional context supporting the development of these higher order cognitive skills by contextualizing reading in the context of real-world environmental concerns. Critical reading strategies enable EFL learners to effectively interact with the reading texts.

According to Zahoor and Janjua (2020) there is a need to address the world crisis of environment in education. There has been little empirical research investigating the causal relationship between green English instruction as an independent variable and critical reading skills and environmental awareness as dependent variables in secondary school EFL environments. Thus, it is necessary to bridge this literature gap

and examine the effect of using green English instruction on developing the critical reading skills in the Jordanian secondary school context.

2-Statement of the problem:

The pilot study revealed low achievement of secondary school Jordanian grade 9 EFL students in critical reading skills (Table 1). Students have problems in using different English tenses. They lack the ability to identify different syntactic constituents and could not recognize different word classes. Other cognitive skills constitute trouble spots for the secondary school students including the comprehension of reading texts, processing, retaining, evaluating, and applying information. Induction of new information, arguing and expressing opinions are weak skills that require treatment as well.

Table 1: Results of the pilot study

Critical Reading Skills	Percentage of Errors
A. Linguistic skills	
Lexis	8
Grammar (knowledge of English tenses)	10
Sentence patterns (simple, compound, complex)	6
Structure (word classes)	7
Syntactic constituents (NP, VP, AP, ADVP, PP)	10
B. Cognitive Skills	
Comprehension	8
Evaluation	5
Analysis	6
Application	4
Information processing	7
Information retention	8
Information induction	10
Argument	6
Opinion expression	5

3-Research questions:

Given the objectives and variables of this study, the present study was designed to answer the following research questions:

- 1.What role does green English instruction play in developing the critical reading skills of Jordanian grade 9 EFL students?
- 2.To what extent does green English instruction contribute to environmental awareness among Jordanian grade 9 EFL students?

4-Hypotheses:

- 1.The posttest critical reading skills of the two groups do not differ from those of the pretest.
- 2.There is no variance between the two groups in the posttest critical reading skills.
- 3.The posttest critical reading skills do not statistically significantly differ between the two groups.
- 4.Green English instruction is not effective in developing the experimental students' critical reading skills compared to the regular method.

5-Aims:

The present study essentially focused on examining the effectiveness of utilizing the green English instruction to develop critical reading skills and environmental awareness among Jordanian grade 9 students enrolled in the Serfa secondary school for girls.

Below are the other aims which the current study sought to realize:

- 1.Identifying the difference between the two groups' pre-and-posttest critical reading skills.
- 2.Determining the variance in the posttest critical reading skills between both groups.

3. Stating the statistically significant differences between the two groups' posttest critical reading skills.

4. Verifying the effectiveness of green English instruction and regular method in developing both groups' critical reading skills.

5-Significance:

1. Developing the FL curricula being taught to Jordanian grade 9 secondary school students in a way that allows the incorporation of green English concept into learning materials and sources.

2. Enhancing the professional development of Jordanian EFL teachers in order to efficiently teach the green English related lexis, structures, and terms to Jordanian EFL secondary school students.

3. Devising appropriate teaching strategies that enable the utilization of green English in the process of FL instruction in the Jordanian context.

4. Enhancing the English critical reading skills among Jordanian grade 9 students in accordance with the goals of ministry of education policy.

5. Instilling the awareness of environmental conservation among Jordanian secondary school students.

6-Delimitations:

1. Jordanian grade 9 EFL students enrolled in the Serfa secondary school for girls, education directorate of Lwa'a Al-Qasr.

2. Critical reading skills.

3. Green English instruction.

4. Environmental awareness.

7-Definition of terms:

According to Abdel Latif (2024), green English instruction innovatively incorporates environment-derived topics into FL teaching and learning processes. In green English instruction, the emphasis of language knowledge learning parallels with the creation of environmental awareness. Thus, students are expected to acquire responsible behavior towards the environment and become knowledgeable about different environmental issues.

-Operational definition:

Green English instruction is employed to enhance the participants' critical reading skills through reading, analyzing, evaluating, and applying different environmental issues pertinent reading texts.

-Critical Reading Skills:

Luke (2018) stated that critical reading refers to the ability of making intentional and conscious sense of the reading text through the use of different and broad perspectives. It encompasses the process of de-codification, assessment, extraction, analysis, inference and argument of meaning.

-Operational definition:

The present study employs the term critical reading strategies in the sense of having linguistic and cognitive skills. Linguistic skills include lexis, grammar, structure, sentence patterns, and syntactic constituents. Cognitive knowledge includes comprehension, analysis, evaluation, application, inference, argument and opinion expressions.

-Literature review:

In a quasi-experimental study, Abdel Latif (2024) examined the impact of using green English instruction on sustaining the writing skills and environmental

awareness among pre-service teachers at the faculty of education. In addition to the handful of studies that have focused on green English instruction, recent research has made a more prominent instructional variable within EFL contexts. Green English instruction as defined by contemporary research is an eco-pedagogical approach that integrates language learning with sustainability and environmental responsibility.

Ali, for example, reviewed green education in EFL classrooms and identified the role of environmental language instruction as a means to elicit environmental literacy and ethical responsibility among students and language learning. The study considered green English instruction a system integrating linguistic information with sustainability values, making it a positive independent variable in language learning. Similar researchers, Bekteshi & Xhaferi (2020) studied the role of English language instruction as a source of sustainability in sustainable development and found that “green” English language instruction engaged the students in their learning, contextualized their language, and exposed them to global environmental issues. They concluded that green English instruction was not just a supplement to existing content, but constituted a core approach of instruction that informed linguistic outcomes and environmental understanding.

Deshmukh (2025) provides support with his work on sustainable English language learning through an eco-pedagogical lens, reporting that ‘where themes of the environment are integrated consistently into EFL instruction, they improve the language skills, critical engagement, and environmental awareness’ of the students. The researchers found green English instruction to represent a school-based approach that combines linguistic purposes with sustainability education, providing additional evidence of it as a primary instructional variable in EFL classrooms.

Yu et al. (2024), also studied sustainability issues in English language learning and demonstrated that establishing sustainable development goals in EFL instruction allows students to critically engage with the environment while also gaining language skills. They found that green English instruction enhances students' awareness of environmental issues, critical thinking, and learner control, thereby consolidating its position as an independent major variable impacting cognition and affect.

Moreover, Özcan and Gürsoy (2024) examined an eco-pedagogical model of English instruction for young learners and found that green English instruction increased learning in the language and environmental literacy areas. It was also found that incorporating environmental issues into EFL instruction improves comprehension, vocabulary acquisition, and environmental sensitivity, supporting the teaching effectiveness of green English in all levels of education.

Seraj (2024) summarized recent research on green technology in language teaching and learning from technical and review perspectives and concluded that green English instruction, if supported by digital and authentic resources, builds sustainable learning environments and enhances the student's involvement with environmental issues. The review stressed that green English instruction represents a changing instructional paradigm that encompasses language, technology, and the environment.

Furthermore, Jung and Dos Santos (2022) explored the eco-responsive nature of EFL instruction, with the results that green English instruction provided meaningful learning experiences because it linked language use to environmental issues in real life. The researchers found that students who are actively involved in EFL instruction with environmental content are more likely to be motivated, to participate more

effectively in the process, and to be more aware of the environment and thus to be more environmentally sensitive. this affirmed the importance of green English instruction as an independent learning variable.

Raphael and Nandan (2024) continued this inquiry by focusing on EFL textbooks and teacher perceptions in Saudi context. Their results also suggested that green English instruction, when applied as a structured pedagogical method, supports CLIL and promotes the environmental consciousness of learners, supporting it as an instructional variable rather than a peripheral teaching theme.

Cordova (2024) conducted a qualitative study on the perception of pre-service teachers and their high school students about the integration of green English instruction in the TEFL process in the Philippines. Data were collected through the instrument of semi-structured interviews. Different interviews were constructed for teachers and students. Teachers' interviews dealt with three stages of implementing the green English instruction, namely pre, while and post. Students' interviews focused on receiving feedback on the employment of green English instruction. The pre-service teachers asserted that green English instruction stimulated collaboration among them during the pre-implementation stage as they shared insights into the lesson plan preparation which differs from that of regular teaching methods. During implementation stage, pre-service teachers discussed the arisen challenges for implementing the green English instruction. They encountered challenges of time management to present all the planned lessons. They need to be trained for interdisciplinary teaching when combining environmental issues with language knowledge. At the post-implementation stage, most of the pre-service teachers expressed satisfaction about the adopted strategies to incorporate environmental topics with language knowledge. Students' interview revealed that green English

instruction alerted them to take the initiative of environment protection. It provided them with the necessary language knowledge they were in need to know. It expanded students' learning experience to be actively engaged in providing solutions for environmental problems. It sustained the students' feelings of being affiliated to society and responsible for handling the environmental issues. Cordova concluded that environmental awareness can be raised through the process of TEFL which presents environmental issues in English language learning classrooms.

Le et al. (2024) explored critical reading abilities among English majors in Vietnam, finding they struggled with synthesis because of the large amount of information in texts, especially regarding identification of main ideas and supporting details. They concluded that critical reading strategies elicit deeper analysis, assessment, and reflection, which makes it easier for EFL learners to understand cultural assumptions, correct biases, and understand the cultural roots of texts.

Mirasol (2024) explored the use of critical reading strategies in the public and private high schools in the Philippines EFL context. The findings showed that comprehension of the reading text was the participants' highest skill while the ability to make predictions out of the reading text was their lowest skill. Evaluation and analysis skills of the reading text varied among participants on the basis of their gender where female students outperformed their male counterparts. The highest results of information synthesis were in favor of the private school students in contrary to those affiliated with the public schools. The findings shed light on the necessary required collaboration of high school teachers and administrators to enhance the participants' critical reading skills.

Rahmasari and Sunarti (2024) quantitatively discussed the effect of using critical reading strategies on the development of Indonesian high school students' English

reading skills. Instruction classes were designed on the basis of using regular reading strategies vis-vis critical reading strategies. The regular strategies were taught to the control group, while the critical strategies were instructed to the experimental students. The participants were pre-and-post tested by using a reading comprehension test. The test specifically includes assessment questions of the students' comprehension, analysis and interpretation of the reading text. In contrast to the regular reading comprehension strategies, the critical reading strategies led to higher significant development of the participants' English reading skills. The experimental students highly improved posttest achievement in readings skills from the pretest achievement. Meanwhile, the posttest achievement of the control group was insignificantly different from that of the pretest. Therefore, Rahmasari and Sunarti emphasized the effectiveness of utilizing critical reading strategies in developing the reading comprehension skills of high school students in Indonesia.

8-Method Research design:

The current study employed pre-and-posttest research design. It made use of the mixed method in analyzing the collected data both quantitatively and qualitatively (Marghany, 2023; Abdel Latif, 2024; Le et al. 2024 and Rahmasari and Sunarti, 2024). This design was chosen to allow for a consistent measure of students' increase in critical reading skills and awareness of the environment that resulted from the instructional treatment. The pre-and-posttest data quantification relied on the use of descriptive statistics such as mean scores and standard deviations. It also relied on inferential statistics of the paired and independent samples t-tests. The qualitative analysis described the participants' pre-and-posttest performances. It also computed the frequency of the experimental students' responses to the perception

questionnaire and the assessment of experimental group's environmental awareness checklist.

-Participants:

Sixty Jordanian grade 9 EFL students participated in the present study. They were enrolled in the Serfa secondary school for girls, education directorate of Lwa'a Al-Qasr. They were all females and their age ranged between 15-16 years old. Participants were selected because of similar educational experiences, level of English education, and socio-cultural background, allowing for homogeneity prior to treatment administration. Students are products of the TEFL process in the Jordanian context. The current study was carried out in the first term of the school year 2024-2025.

-Procedures:

In the beginning of the first term of school year 2024-2025, two classes of Jordanian grade 9 students were assigned as control and experimental groups. The participants sat for the critical reading skills pretest to determine their pretest performance. The pretest results indicated that both groups performed statistically similarly on their first critical reading skills prior to instruction. Both groups received remedial treatment over a 10-week period. The control group studied critical reading strategies by using the regular methods, which were primarily based on textbook reading passages, teacher explanations, and traditional comprehension questions, whereas the experimental group studied the same strategies through the utilization of green English instruction. The experimental treatment was implemented as a program of practical study involving ten units of instruction over two weeks. Each session lasted about 45 minutes.

The practice program was based on a combination of environmental topics and specific critical reading methods. A similar instructional format was applied in each unit: pre-reading literary retelling of environmental background knowledge, while-reading linguistic and cognitive skills development, and post-reading analytical and problem-solving activities.

Both groups sat once again for the critical reading skills posttest towards the end of the second term (Appendix A). A 32-item questionnaire was applied to the control and experimental students to determine their perceptions about using the regular method versus green English instruction for learning the critical reading strategies (Appendix B). An environmental awareness checklist was also administered to the experimental group only based on the observations of three TEFL experts including the researcher herself (Appendix C). The three data collection instruments were referred to a jury of three TEFL professional experts to determine the instruments' internal and external validity.

A pilot study was conducted prior to the main experiment with 15 grade 9 students not involved in the main study. This pilot study was designed to determine the quality of instructions, the nature of test items, time allocation, and the viability of using the instruments in the classroom.

The pilot participants' feedback provided some unclear language and sequence for some items, which were later rewritten to make them clearer and relevant to the study objectives. Cronbach's alpha coefficients were .93, .90, and .89 for the critical reading test, perception questionnaire and environmental awareness checklist successively. The three Cronbach's alpha coefficients suggested high reliability for the three instruments.

-Lesson Plans of Green English Instruction:

The lesson plans of green English instruction combined the aims of realizing linguistic knowledge and creating environmental awareness among the Jordanian grade 9 EFL students. The practical training focused on the student-centered learning based on both real-world environmental texts, the shared discussion of environmental issues, and problem solving through an authentic environment text. The lesson plans recognized the importance of utilizing advanced technology in sustaining the concept of environment conservation among the experimental students. Thus, lesson plans relied on audio-visual authentic reading texts derived from various online websites. The teaching content ranged from a single environmental concept to a more complex global topic, so that students learned to speak and think critically.

The reading texts include environmental topics such as pollution, climate change, renewable energy, recycling, environment conservation, eco-system, etc. Table 2 introduces a lesson plan model about using the green English instruction for teaching the environmental issue of pollution.

Table 2: A Lesson Plan Model for Using Green English Instruction

Item	Description
Title	Pollution
Website	https://en.islcollective.com/english-esl-worksheets/reading-comprehension/reading-for-detail-deep-reading/pollution/3919
Main Objective	The lesson mainly aims to train students on using different language aspects of the reading text and create environmental awareness among students of the issue of pollution
Pre-Reading Phase	- New vocabulary was introduced to students such as harmless, harmful bacteria, rubbish tips, decay, endangered marine life, sewage, valuable metal, break down, etc. - Students were asked about their background information about pollution.
While-Reading Phase	A. Language knowledge: - Some grammar rules were introduced. - Types of English sentences were highlighted. - Derivational affixes were explained - Students did multiple choice exercises on the selection of appropriate words B. Cognitive Knowledge: Students were trained to: - Identify the main idea - Identify supporting ideas - Practice Bloom's taxonomy of knowledge through analysis, evaluation, remembrance, synthesis, application of information - Students practiced true/false exercises on statements of the reading text
Post-Reading Phase	- Students held group discussions about the issue of pollution. - Students suggested solutions to solve the problem of pollution. - Students were asked to do exercises pertinent to the reading text of pollution

- Data collection instruments:

The elicitation of data relied on three instruments, namely critical reading test, perception questionnaire and environmental awareness checklist. The critical reading test was adopted as data elicitation technique in different studies such as Le et al. (2024), Mirasol (2024) and Rahmasari and Sunarti (2024). The present study constructs the critical reading skills test by selecting a reading passage about global warming derived from environment and sustainable development report, p. 4. <https://ncert.nic.in/textbook/pdf/keec109.pdf>

The current study divides the test into three main sections. Section A includes twenty-five multiple choice questions pertinent to the reading passage. Section A tested the participants' language knowledge about vocabulary, sentence structure, forms and types. Section B contains twenty-five true and false statements about the selected reading passage. Section B tested the participants' ability to analyze, evaluate, synthesize and apply information of environment related issues. Section C requires the participants to provide suggestions and solutions for solving the environment-related issues. Section C tested the participants' ability to induce new information, provide solutions and express their opinions about issues related to environment conservation. The total mark of the critical reading skills test was 75 marks where 25 marks were allocated for each section.

The 32-item questionnaire was constructed based on reviewing the previous studies such as Bekteshi and Xhaferi (2020), Faramarzi and Janfeshan (2021), Jung and Dos Santos (2022), and Raphael and Nandanan (2024). It is divided into two sections: linguistic knowledge (1-20) and cognitive skills (21-32). The first section contains items about vocabulary, synonyms, antonyms, hypernyms, hyponyms, semantic features of word concept, sense concept, connotative and collocative types

of meaning, types and forms of English sentences, syntactic constituents, grammar rules, morphological structure, derivation and inflection, etc. The second section includes statements about benefits of utilizing the green English instruction covering different levels of Bloom' taxonomy of knowledge: analysis, evaluation, remembrance, synthesis, induction, and application. It also handles ability to hold discussion, opinion expressions, and provide collaboration atmosphere for language learning. The questionnaire was constructed on the basis of five-Likert scale providing five responses: Strongly Disagree=5, Disagree=4, Not Sure=3, Strongly Agree=2, and Agree=1

The 12-item students' environmental awareness checklist was created according to various studies namely, Ali (2022), Nur et al. (2022), Pruneau, et al. (2023), and Cordova (2024). The evaluation of experimental students' environmental awareness was conducted by the researcher herself and the assistance of two senior English teachers. The evaluation was based on observing the experimental students over the period of 10 weeks. These abilities encompass environment issues comprehension, discussion of environment issues, comparison of environment issues with the experimental students' background knowledge, adoption and promotion of environmental conservation concept, willingness to perform voluntary works for environment conservation, suggestions of possible solution to environment issues, etc. The evaluation checklist was designed on the basis of four-Likert scale offering four rates for the experimental students' environment awareness: Always=4, Sometimes=3, Seldom=2, and Never=1.

-Data Analysis:

The current study employed inferential statistics for different reasons. Through the employed paired samples t-test, the present study aimed to identify the potential

differences that may exist in the pre-and-post performances in critical reading skills of both groups. It used the independent samples t-test to:

1. Identify the potential development of both groups' critical reading skills in the posttest.
2. Determine the statically significant differences between both groups' posttest performances in critical reading skills.
3. Verify the effectiveness of green English instruction vis-à-vis the regular method in developing the participants' critical reading skills. The verification is based on the computation of both groups gained mean scores.

In addition, the qualitative analysis used frequencies of the experimental students' responses to the perception questionnaire of using green English instruction. Frequencies were also computed for the four rates given by the three TEFL raters who evaluated the experimental students' environmental awareness.

Table 3 represents the descriptive statistics of the critical reading skills pretest. The results indicated very poor performance of the control and experimental groups in the critical reading skills. The minimum and maximum scores of the control group fall between 20 and 27 marks, while they range between 21 and 27 marks for the experimental group. Values of mean scores and standard deviations were (12.74) and (3.57) for the control group and (12.86) and (3.68) for the experimental students. The two groups did not achieve the minimal requirements for passing the pretest. They could not fulfill any of the language knowledge or cognitive skills listed in Table 1. All participants had problems identifying antonyms and synonyms of various words such as *gradual*, *increase*, *deforestation*, *niches*, *extinction*, *past century*, *reduction*. They could not also identify the syntactic categories of *warming*, *observed*, *projected*, and *supplies*. They failed to select appropriate affixes to form

the noun of disappear, and the adverb of frequent. They also had problems with identifying types of English sentences, the grammatical functions of *decrease* and *increase* as nouns and verbs. As for the cognitive skills, the results showed inability on the part of all participants to analyze, evaluate, synthesize, remember, induce and apply information about global warming. Only a few students provided some suggested solution for the global warming problem written in linguistically limited responses. The findings affirmed the first null hypothesis that critical reading skills do not differ among all participants in the pretest. The findings were compatible with those reported by Al Roomy (2022), Le et al. (2024), Mirasol (2024) and Rahmasari and Sunarti (2024).

Table 3: Pretest Descriptive Statistics

Group	N	MS	SD	Min.	Max.
Control pretest	30	12.743	3.57314	20	27
Control posttest	30	22.406	11.95313	34	50
Experimental pretest	30	12.861	3.68525	21	27
Experimental posttest	30	35.289	23.37518	40	72
Valid Number	30				

Table 4 indicates better development of the experimental students' critical reading skills in the posttest in comparison to the control group participants. The former achieved higher values of the mean scores (35.28) and standard deviations (23.37) compared to (22.40) and (11.95) for the latter. As for language knowledge, the experimental students highly developed their ability to identify synonyms, antonyms, syntactic categories of words and phrases, patterns of English sentences, and grammatical functions of different words. They also showed supremacy over their control counterparts in evaluating, analyzing, remembering, synthesizing and applying information about global warming. They highly outperformed the control

group students in providing solution for solving the global warming problem. These solutions include organizing online campaigns against the emission of greenhouse gases, urging states to stop burning forests, informing others about the potential dangers of global warming, and promoting voluntary works to protect the environment. The findings led to the rejection of the second null hypothesis that posttest critical reading skills do not differ between the two tested groups. Table 4 also shows that there are statistically significant differences between the posttest development of critical reading skills between the two investigated groups. The present study rejects the third null hypothesis. The findings are compatible with those reported by Luke (2018), Abdel Latif (2024), Cordova (2024), Le et al. (2024), Mirasol (2024) and Rahmasari and Sunarti (2024).

Table 4: Paired Samples T-Test

Group	N	MS	SD	DF	t-value	Sig.
Control pretest	30	12.743	3.57314	29	6.942	0.009
Control posttest	30	22.406	11.95313	29		
Experimental pretest	30	12.861	3.68525	29	24.364	0.000
Experimental posttest	30	35.289	23.37518	29		
Valid Number	30			29		

Table 5 represents the computation of the gained mean scores of the two groups. It shows that experimental participants attained largely higher gained mean score in the posttest (22.42) vis-à-vis that of control group students (9.66). It also shows that the difference between both groups is statistically significant since the p value is less than 0.05 ($p < 0.05$). Therefore, the experimental group's higher gained mean score ascertains the effectiveness of utilizing green English instruction vis-à-vis the regular method in developing the participants' critical reading skills. As such, the fourth null hypothesis is rejected as the two teaching methods are not equally effective to

develop the skills of critical reading among the examined participants. The finding comes in agreement with those reported by Abdel Latif (2024), Cordova (2024), Le et al. (2024), Mirasol (2024) and Rahmasari and Sunarti (2024).

Table 5: Computed Gained Mean Scores

Critical Reading Skills	N	GMS	SD	df	t-value	Sig.
Control	30	9.66	8.37	29	17.422	0.000
Experimental	30	22.42	19.68	29		

Analysis of the experimental students' responses to the perception questionnaire is introduced in Table 6. In contrast to the frequencies of Strongly Agree (207) and Agree (147) responses of control group students, their experimental counterparts attained extremely higher frequencies of these two responses (453) and (340). The latter responses of Strongly Disagree (78) and Disagree (57) were extremely lower than those (221) and (234) for the control group.

Reading closer to Table 6 suggests that the experimental students consistently exhibited positive attitudes regarding linguistic knowledge as well as cognitive skills. The concentration of "Strongly Agree" and "Agree" responses indicates that green English instruction was viewed as highly effective in helping students to learn vocabulary, grammar understanding, sentence structure awareness, and syntactic knowledge. Additionally, the experimental students reported a marked improvement in higher-order cognitive skills of analysis, assessment, synthesis, inference, and opinion expression.

By contrast, the control group's responses were concentrated on "Strongly Disagree" and "Disagree", reflecting frustration with the typical classroom approach and their limited reach in supporting critical reading. This distance in perception between the two groups provides qualitative evidence for the quantitative findings

and illustrates the instructional advantages of green English instruction in promoting the language and critical reading ability. The finding agrees with those reported by Zahoor and Janjua (2020), Kose and Gunes (2021), Abdel Latif (2024), Cordova (2024), and Raphael and Nandan (2024).

Table 6: Students' Perceptions about using the Regular Method and the Green English Instruction (GEI)

No.	Skills	SD	D	NS	SA	A
		C E	C E	C E	C E	C E
	A. Linguistic Knowledge					
1	It sustains learning of vocabulary	7 2	9 3	4 0	7 19	4 6
2	It clarifies the distinction between synonyms and antonyms	5 2	7 1	4 1	7 13	7 12
3	It fully explains hypernyms and hyponyms	6 3	8 2	5 1	8 14	3 10
4	It provides clear explanation of the use of homonyms	4 2	7 2	4 0	7 15	8 11
5	It helps to understand the relationships between signifiers	9 1	8 0	6 1	5 16	2 16
6	It leads to the comprehension of word concept	8 3	8 1	5 1	7 12	2 13
7	It sustains knowledge of	6 1	9 1	4 0	8 18	3 10

	sense concept					
8	It reinforces the comprehension of the connotative meaning	7 3	8 2	3 0	6 17	6 8
9	It enables students to comprehend the morphological structure of words	9 2	6 1	7 1	6 18	1 8
10	It helps students to differentiate between different word classes	5 3	8 1	6 0	7 16	4 10
11	It reinforces students' ability to use derivational forms of words	8 2	8 2	5 1	6 14	3 11
12	It helps students to understand inflectional forms of words	6 3	9 2	8 1	4 12	3 12
13	It sustains students' understanding of the phonemic features of affixes	5 2	7 1	6 1	6 15	6 11
14	It enables students to recognize the syllable structure of words	8 5	7 2	4 1	7 11	4 11
15	It helps students to comprehend usages of different tenses	6 3	8 1	3 0	8 16	5 10

16	It reinforces students' comprehension of sentence structure	7 2	7 2	4 1	8 15	4 10
17	It enable students to differentiate between declarative, interrogative, exclamatory, and imperative forms of sentences	5 4	8 1	5 1	7 13	5 11
18	It clarifies the difference between main and subordinate clauses	9 3	9 3	4 1	6 14	2 9
19	It enables students to use conjunctions properly	5 1	7 1	3 1	7 16	8 11
20	It sustains students' understanding of the syntactic structures of sentences	6 2	6 2	4 1	7 13	7 12
	B. Cognitive Skills					
21	It helps students identify the main idea of the reading text	7 1	5 1	6 1	8 12	11 15
22	It enables students to identify the supporting ideas of the reading text	8 2	8 3	7 0	5 10	2 15
23	It reinforces students'	7 3	9 1	4 1	5 12	5 3

	ability to process information included in the reading text					
24	It helps students to retain information	6 2	8 1	5 0	6 12	5 15
25	It sustains students' ability to analyze information	8 1	5 3	3 1	7 14	7 11
26	It develops students' ability to synthesize information	9 3	7 2	4 2	7 12	3 11
27	It enhances students' ability to evaluate information	7 4	7 2	5 1	6 13	5 10
28	It enables to students to apply the newly acquired information	6 2	5 3	7 2	5 14	7 9
29	It helps students to express their opinions about the acquired information	8 3	4 3	4 2	6 13	8 9
30	It sustains students' ability to infer new information from the acquired one	9 4	6 2	5 1	6 14	9 9
31	It helps students to hold argumentative discussions about the acquired information	7 3	8 2	4 2	7 16	4 7

32	It sustains collaborative learning among students	8 1	7 3	6 1	5 12	4 13
	Total Frequency	221/78	234/57	158/28	207/453	147/340

Table 7 introduces the three raters' evaluation of the impact of employing the green English instruction to develop the environmental awareness among experimental students. The experimental group obtained immensely high rates of Always (145) and Sometimes (161) responses. They also obtained low rates of the Seldom (36) and Never (17) responses. These findings provide clear empirical evidence that green English instruction had a significant effect on improving the environmental awareness of the experimental students as a consequence of increased awareness of environmental issues, willingness to adopt environmentally friendly behaviors, and active participation in discussing and supporting environmental conservation. The findings indicate high rate of environmental awareness among the experimental students.

The distribution of responses in Table 7 shows clearly positive effects of green English instruction on the environmental awareness of the experimental students. High frequency of "Always" and "Sometimes" responses indicate that students became knowledgeable about environmental issues, were able to communicate different types of environmental concepts, and were more willing to be environmentally responsible.

Also, there is little resistance or indifference to environmental ideas or concepts which seems to be missing or at least a few "Seldom" responses and "Never", indicating that the instructional treatment has been successful in instilling environmental values. It also reveals that the students were able to translate environmental terms and ideas into everyday life, share environmental issues on

their own and become engaged activists for environmental preservation in their communities.

Collectively, these findings point to the fact that green English instruction not only teaches cognitive awareness but also allows for attitudinal and behavioral changes, which is one of the primary objectives of the present study. The findings are compatible with those reported by Pruneau et al. (2023), Abdel Latif (2024), Cordova (2024), and Raphael and Nandan (2024).

Table 7: Environmental Awareness Checklist

No.	Skills	Always	Sometimes	Seldom	Never
1	Students have become knowledgeable about environmental issues	10	14	3	3
2	Students could determine the connection between different environmental issues	12	16	2	0
3	Students could identify the reasons behind the environmental issues	13	12	3	2
4	Students could related environmental issues to their background knowledge	11	13	4	2
5	Students have better understanding of the different environmental issues	14	12	3	1
6	Students have become willing to do voluntary work	13	14	3	0

	for environment conservation				
7	Students could independently discuss various environmental issues	12	13	4	1
8	Students could suggest solutions to environmental problems	10	14	3	1
9	Students conveyed the concept of environment conservation to their family, friends, and colleagues	14	12	4	2
10	Students have become good spokesmen of environmental issues	11	15	3	1
11	Students have adopted environmentally friendly behavior	13	12	2	3
12	Students could use environmental terminology in their daily routines	12	14	2	2
	Total Frequency	145	161	36	17

-Discussion:

The experimental students realized better development of their critical reading skills due to the utilization of green English instruction which increased their motivation towards mastering the critical reading strategies. The green English instruction helped to develop the language knowledge and cognitive skills of the experimental students in a more effective manner than that of the regular method. In

contrast to the control participants, experimental students managed to have better development of their ability of identifying synonyms, antonyms and the syntactic categories at the levels of phrases and sentences. They also improved their knowledge about sentence structures and patterns. The development of experimental students' language knowledge is attributed to the benefits of the green English instruction which provided authentic learning materials with well-formed structures and sentences. Being exposed to such learning materials, the experimental students became capable of developing their language knowledge. Such learning materials are also rich in various lexis and terminologies, so as the experimental students can exploit them in their daily life routines. In addition, the experimental students managed to develop their cognitive skills in the light of Bloom's taxonomy of knowledge because of implementing the green English instruction. The green English-based learning materials are full of abundant information and details, so as the experimental students were well-trained to analyze, evaluate, remember, synthesize and apply these details for the development of their critical reading strategies. The findings come in agreement with those reported by Luke (2018), Abdel Latif (2024), Cordova (2024), Le et al. (2024), Mirasol (2024) and Rahmasari and Sunarti (2024).

Analysis of the experimental group's responses to the perception questionnaire, as opposed to those of the control group, revealed that the experimental participant positively viewed the benefits of utilizing the green English instruction in developing their critical reading skills. On the other hand, the control group students expressed negative views about the use of the regular method in studying and learning the critical reading strategies. The different views of both groups are related to the different learning environments created by the green English instruction and the

regular method. The former was effectively successful in training the experimental students on the proper usage of critical reading skills in contrast to the latter which did not adequately motivate the control group students to properly practice the critical reading strategies. The findings of computing the gained mean scores of both groups and these of the two perception questionnaires affirmed the effectiveness of employing the green English instruction for the purpose of developing the critical reading strategies of the experimental Jordanian grade 9 EFL students. These findings are compatible with those reported by Zahoor and Janjua (2020), Kose and Gunes (2021), Abdel Latif (2024), Cordova (2024), and Raphael and Nandan (2024).

The findings of the evaluation checklist show that green English instruction largely contributed to increase of experimental students' environmental awareness. The experimental students increased their knowledge about environmental issues and can connect these issues to each other. They became capable of identifying the reasons behind these issues and can compare these issues to their background information. They improved their comprehension of these issues and became willing to do voluntary work for environment conservation. They became capable of holding independent discussions about these issues and suggest tentative solutions to address such issues. They became effective advocates who promote these issues among relatives, friends and colleagues. They adhered to the environmentally friendly behavior and used environment terms in their daily life interactions. The findings agree with those reported by Pruneau et al. (2023), Abdel Latif (2024), Cordova (2024), and Raphael and Nandan (2024).

-Implications:

Green English instruction successfully helped the experimental participants to enhance their critical reading skills and ability of mastering pertinent vocabulary,

interpreting different structures of English sentences, and comprehending, analyzing, and discussing several environmental issues. It also enabled the experimental students to process, evaluate and infer information on the one hand and form and develop opinions about environmental issues on the other.

Due to the effectiveness of employing the green English instruction, curriculum planners and designers should integrate and adjust the environmental issues to suit the learning needs of secondary school students in the Jordanian context. Selection of appropriate environmental topics is a necessity to enhance the Jordanian secondary school students' English language proficiency. As evident, the experimental participants managed to improve their critical reading skills through the utilization of environmental reading texts. Such reading texts provide authentic learning materials which fostered the participants' ability to understand real-world issues, different structures of formulating English sentences, and proper usage of related vocabulary.

The findings of the present study entail that teachers' preparation and training programs should consider providing necessary training of EFL Jordanian secondary school teacher of suitable implementation of green English instruction. The training should include devising appropriate teaching strategies for different language skills in line with the selected environmental topics. It also should imply ways of teaching lexical, structural, grammatical and phonological aspects of language knowledge through such environment related reading texts.

8-Conclusion:

The present study concluded the effectiveness of using the green English instruction to develop the experimental students' critical reading skills on the one hand and the increase of their environmental awareness on the other. It is evident

that the green English instruction had more and higher effective contribution towards the experimental students' critical reading strategies in comparison to the regular method applied to train the control group students for the same purpose. The employment of green English instruction led to distinct performance of critical reading strategies for the experimental students as opposed to that of the regular method in the case of the control group. Owing to the green English instruction, the experimental students managed to highly develop their language knowledge and cognitive skills. The development includes knowledge of lexis, synonyms and antonyms, syntactic categories, sentence structures and patterns on the one hand. It also involves cognitive skills in terms of analysis, evaluation, synthesis, remembrance, and application of acquired information and knowledge on the other hand.

As a result of its effectiveness, experimental students positively viewed the utilization of green English instruction to develop their critical reading skills. In contrast, the control students held negative views about the use of regular methods for teaching critical reading skills. Furthermore, the green English instruction increased the experimental students' environmental awareness. They attained full comprehension of the environmental issues and were willing to do voluntary work for environment protection. Therefore, the present study strongly recommends the incorporation of green English instruction into the curriculum planning and design of the English syllabi being taught to the Jordanian grade 9 EFL students.

-Recommendations and Suggestions:

Based on the findings of this study, several suggestions and recommendations have been proposed to further enhance use of green English instruction within EFL contexts:

1. Jordanian secondary school foreign language instruction needs to be systematically designed so that green English instruction is integrated within the language learning goals and the environmental education goals.
2. The planners of curriculum must include environmentally relevant content that addresses the cognitive, linguistic, and developmental needs of the secondary school students of Jordan.
3. Government officials in the Ministry of Education should take steps to initiate new programs and initiatives that build awareness about the environment through language instruction for their students.
4. Training and professional development for EFL teachers should be focused on the effective use of green English instruction, such as linking environmental lessons to linguistic and critical reading skills.
5. Future research may look at how green English concepts are found in Jordanian secondary school textbooks and how they are relevant to sustainability goals.
6. Future research would explore the impact of green English instruction on the acquisition of other language skills, such as writing, speaking, or listening, among Jordanian EFL learners.
7. Researchers may also consider the relevance of green education to other learning styles and stages of instruction including tertiary education, in order to better understand its broader pedagogical implication.

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-Appendix A:**-Critical Reading skills Test:**

The selected reading text entitled Global Warming derived from environment and sustainable development report, (20-2023) p. 4.

<https://ncert.nic.in/textbook/pdf/keec109.pdf>

Seventy Five Marks

Read the following text and answer the questions below:

Global Warming

Global warming is a gradual increase in the average temperature of the earth's lower atmosphere as a result of the increase in greenhouse gases since the Industrial Revolution. Much of the recent observed and projected global warming is human-induced. It is caused by man-made increases in carbon dioxide and other greenhouse gases through the burning of fossil fuels and deforestation. Adding carbon dioxide, methane and such other gases (that have the potential to absorb heat) to the atmosphere with no other changes will make our planet's surface warmer. The atmospheric concentrations of carbon dioxide and CH₄ have increased by 31 per cent and 149 per cent respectively above pre-industrial levels since 1750. During the past century, the atmospheric temperature has risen by 1.1°F (0.6°C) and sea level has risen several inches. Some of the longer-term results of global warming are melting of polar ice with a resulting rise in sea level and coastal flooding; disruption of drinking water supplies dependent on snow melts; extinction of species as ecological niches disappear; more frequent tropical storms; and an increased incidence of tropical diseases.

Among factors that may be contributing to global warming are the burning of coal and petroleum products (sources of carbon dioxide, methane, nitrous oxide, ozone); deforestation, which increases the amount of carbon dioxide in the atmosphere; methane gas released in animal waste; and increased cattle production, which contributes to deforestation, methane production, and use of fossil fuels. A UN Conference on Climate Change, held in Kyoto, Japan, in 1997, resulted in an international agreement to fight global warming which called for reductions in emissions of greenhouse gases by industrialized nations.

Section A: (25 Marks)

Choose the correct answer A, B, or C:

1. The antonym of 'gradual' is
a. Eventual b. sudden c. hazard
2. 'Warming' is a noun in the form of
a. Gerund b. numerical c. pronoun
3. The phrase 'a gradual increase' is a/an phrase
a. Adj. b. adverb c. noun
4. The antonym of 'increase' is
a. Flourish b. decrease c. supply
5. 'As a result of' refers to
a. Contrast b. comparison c. consequence
6. The sentence 'Much of the recent observed and projected global warming is human-induced.' is a sentence.
a. Compound b. complex c. simple
7. The words 'observed' and 'projected' function as
a. Adjectives b. adverbs c. nouns
8. 'Deforestation' means of forests.
a. Removal b. protection c. maintenance
9. Global warming occurs due to greenhouse gases
a. Missions b. emotions c. emissions
10. Greenhouse gases can heat.
a. Expel b. absorb c. produce
11. is harmless to the environment.
a. Oxygen b. methane c. carbon dioxide
12. 'The past century' refers to the hundred years
a. Last b. current c. forthcoming
13. Global warming the existence of some species.

- a. Danger b. dangerous c. endangers
14. The synonym of 'extinction' is
- a. Laying out b. dying out c. putting off
15. The synonym of 'niches' is
- a. Windows b. outlets c. sources
16. The noun of 'disappear' is formed by adding the suffix
- a. —ment b. —ance c. —ion
17. The adverb of 'frequent' is formed by adding the suffix.....
- a. —ing b. —lly c. -ly
18. 'Water supplies' is a/an Phrase.
- a. Verb b. noun c. adverb
19. The word 'increased' in 'an increased incidence' is a/an
- a. Adjective b. adverb c. noun
20. 'UN' is a/an
- a. Acronym b. adverb c. preposition
21. The increase of 'Nitrous' is a Gas to the environment.
- a. Harmless b. harmful c. hurtful
22. The verb 'fight' in the passage means
- a. Combat b. sustain c. reinforce
23. The word 'factors' in the passage means
- a. Season b. seasons c. reasons
24. The antonym of 'reduction' is
- a. Increase b. decrease c. sustainability
25. 'With a resulting rise' is a/an phrase
- a. Adjective b. adverb c. prepositional

Section B: (25 Marks)

Sate the true or false statements among the following:

- Global warming is an old phenomenon.
- Man has nothing to do with the occurrence of global warming.

3. Temperature gradually increases in global warming.
4. Greenhouse gases decline in global warming.
5. Burning of fossil fuels and deforestation lead to global warming.
6. The Industrial Revolution is viewed as one of the reasons behind global warming.
7. Carbon dioxide does not belong to greenhouses.
8. Methane is an environmentally friendly gas.
9. Temperature witnessed moderate rise during the last century.
10. The sea level had witnessed average rise in the past.
11. Global warming has short-term consequences.
12. Global warming requires a change of human behavior.
13. Melting of polar ice is harmful to the environment.
14. Melting of polar ice protects the environment.
15. Tropical storms are expected to occur infrequently in the future.
16. Tropical diseases will increase in the future.
17. Global warming refers to the increase in greenhouse gasses.
18. Burning of coal and petroleum products sustains global warming.
19. There is no world unanimity of the danger of global warming.
20. Global warming is responsible for the increase of coastal flooding.
21. China hosted the conference on climate change in 1997.
22. The conference called for curbing the greenhouse gasses emissions.
23. The industrialized states have no role in fighting global warming.
24. Global warming occurs due to several factors.
25. International efforts of fighting global warming only started the beginning of third millennium.

Section C: (25 Marks)

Suggest solutions for the global warming problems:

A.
.....

B.

.....

.....

C.

.....

.....

D.

.....

-Appendix B:

Control and Experimental Students' Perceptions about using the Regular Method and the Green English Instruction (GEI)

No.	Skills	Strongly Disagree	Disagree	Not Sure	Strongly Agree	Agree
	A. Linguistic Knowledge					
1	It sustains learning of vocabulary					
2	It clarifies the distinction between synonyms and antonyms					
3	It fully explains hypernyms and hyponyms					
4	It provides clear explanation of the use of homonyms					
5	It helps to understand					

	the relationships between signifiers					
6	It leads to the comprehension of word concept					
7	It sustains knowledge of sense concept					
8	It reinforces the comprehension of the connotative meaning					
9	It enables students to comprehend the morphological structure of words					
10	It helps students to differentiate between different word classes					
11	It reinforces students' ability to use derivational forms of words					
12	It helps students to understand inflectional forms of words					
13	It sustains students' understanding of the phonemic features of affixes					
14	It enables students to					

	recognize the syllable structure of words					
15	It helps students to comprehend usages of different tenses					
16	It reinforces students' comprehension of sentence structure					
17	It enable students to differentiate between declarative, interrogative, exclamatory, and imperative forms of sentences					
18	It clarifies the difference between main and subordinate clauses					
19	It enables students to use conjunctions properly					
20	It sustains students' understanding of the syntactic structures of sentences					
	B. Cognitive Skills					
21	It helps students to identify the main idea of the reading text					

22	It enables students to identify the supporting ideas of the reading text					
23	It reinforces students' ability to process information included in the reading text					
24	It helps students to retain information					
25	It sustains students' ability to analyze information					
26	It develops students' ability to synthesize information					
27	It enhance students' ability to evaluate information					
28	It enables to students to apply the newly acquired information					
29	It helps students to express their opinions about the acquired information					
30	It sustains students' ability to infer new information from the acquired one					

31	It helps students to hold argumentative discussions about the acquired information					
32	It sustains collaborative learning among students					

Appendix C

Environmental Awareness Checklist

No.	Skills	Always	Sometimes	Seldom	Never
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1	Students have become knowledgeable about environmental issues				
2	Students could determine the connection between different environmental issues				
3	Students could identify the reasons behind the environmental issues				
4	Students could related environmental issues to their background knowledge				
5	Students have better understanding of the different environmental issues				
6	Students have become willing to do voluntary work for environment				

	conservation				
7	Students could independently discuss various environmental issues				
8	Students could suggest solutions to environmental problems				
9	Students conveyed the concept of environment conservation to their family, friends, and colleagues				
10	Students have become good spokesmen of environmental issues				
11	Students have adopted environmentally friendly behavior				
12	Students could use				

	environment terminologies in their daily routines				
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نهج "اللغة الإنجليزية الخضراء" في التدريس لتنمية مهارات القراءة النقدية والوعي البيئي لدى طالبات المرحلة الثانوية

الملخص

تناولت هذه الدراسة أثر استخدام نهج "اللغة الإنجليزية الخضراء" (Green English) في تنمية مهارات القراءة النقدية والوعي البيئي لدى طالبات المرحلة الثانوية. شاركت في الدراسة ستون طالبة أردنية من الصف التاسع ممن يدرسن اللغة الإنجليزية، وهن طالبات في مدرسة "سرفا" الثانوية للبنات التابعة لمديرية التربية والتعليم في لواء القصر. وقد قُسمت المشاركات إلى مجموعتين: ضابطة وتجريبية. واعتمدت عملية جمع البيانات على ثلاث أدوات، وهي: اختبار القراءة النقدية، واستبانة لقياس التصورات، وقائمة للتحقق من الوعي البيئي. كما اعتمدت الدراسة تصميماً بحثياً قائماً على الاختبارين القبلي والبعدي، واستخدمت المنهج المختلط لتحليل البيانات المجمعة كمياً ونوعياً. وأظهرت النتائج أن تدريس اللغة الإنجليزية وفق نهج "اللغة الإنجليزية الخضراء" ساهم بشكل إيجابي في تنمية مهارات القراءة النقدية لدى الطالبات الأردنيات في الصف التاسع. وأوصت الدراسة بضرورة أن تتضمن عمليات تخطيط وتصميم مناهج اللغة الإنجليزية للمرحلة الثانوية في الأردن مواد تعليمية قائمة على نهج "اللغة الإنجليزية الخضراء"، فضلاً عن تدريب المعلمين على توظيف هذا النهج في سياق الممارسات الصفية.

الكلمات المفتاحية: اللغة الإنجليزية الخضراء، مهارات القراءة النقدية، الوعي البيئي، المدارس الثانوية، طالبات أردنيات (متعلمات للغة الإنجليزية).