

Using the Brainstorming Strategy to Develop Arabic Reading Comprehension for Seventh Grade Students in Jordan

Sameer Mohammad Ali Al-Hirsh* ¹, Feras Mahmoud Alslaiti² 

¹ Department of French Language, Al al-Bayt University, Mafrqa, Jordan.

² Department of Curricula and Instruction, Al al-Bayt University, Mafrqa, Jordan.

Received: 27/9/2022

Revised: 9/5/2023

Accepted: 22/6/2023

Published: 30/5/2024

* Corresponding author:
sameeralhirsh@aabu.edu.jo

Citation: Al-Hirsh, S. M. A. ., & Alslaiti, F. M. (2024). Using the Brainstorming Strategy to Develop Arabic Reading Comprehension for Seventh Grade Students in Jordan. *Dirasat: Human and Social Sciences*, 51(3), 336–348.
<https://doi.org/10.35516/hum.v51i3.2461>

Abstract

Objectives: This study examines the effectiveness of using the brainstorming teaching strategy to develop critical and creative reading comprehension levels in the Arabic language subject for seventh grade students in Jordan.

Methods: This study adopted the quasi-experimental approach. A survey question slip for Arabic language teachers, a brainstorming teaching plan, and a pre-posttest were designed in order to measure the levels of critical and creative reading skills. The sample of the study consists of 167 students selected randomly from 7045 seventh graders at schools under the first Directorate of Education in Irbid. The sample of the study was divided into one control group and one experimental group of female students, and one control group and one experimental group of male students.

Results: The study showed that there were statistically significant differences between the means of scores of the selected sample concerning their performance in both the critical and creative reading posttests, which can be attributed to the brainstorming strategy and in favor of the experimental group. The study also showed that there were no statistically significant differences between the means of scores of the selected sample in terms of their performance in the critical reading posttest that can be attributed to gender. In addition, the study showed that there were statistically significant differences between the means of scores of the selected sample regarding their performance in the creative reading posttest which can be attributed to gender and in favor of female students.

Conclusions: Brainstorming improves students' both critical and creative reading skills in Arabic. The study recommends that Arabic language teachers apply the brainstorming strategy to teaching different Arabic textbooks and for other grades, focusing on adolescents.

Keywords: Brainstorming, reading comprehension, seventh grade students, critical level, creative level.

استخدام استراتيجية العصف الذهني في تطوير فهم المقروء باللغة العربية لطلبة الصف السابع في الأردن

سمير محمد علي الهرش^{1*}، فراس محمود السليتي²
¹قسم اللغة الفرنسية، كلية اللغات الأجنبية، جامعة آل البيت، المفرق، الأردن
²قسم المناهج، كلية العلوم التربوية، جامعة آل البيت، المفرق، الأردن

ملخص

الأهداف: تنفحص هذه الدراسة فعالية استخدام استراتيجية التدريس بالعصف الذهني في تطوير المستويات الناقدة والإبداعية لفهم المقروء في اللغة العربية لطلبة الصف السابع في الأردن.

المنهجية: اتبعت الدراسة المنهج شبه التجريبي؛ حيث جرى تصميم قسمة سؤال مسحي لمدرسي اللغة العربية وخطة تدريبية للعصف الذهني واختبار قبلي بعدي من أجل قياس المستويات الناقدة والإبداعية لمهارات القراءة. تكونت عينة الدراسة من 167 من الطلبة تم اختيارهم عشوائيًا من أصل 7045 طالبًا وطالبة من الصف السابع في مدارس مديرية تربية إربد الأولى؛ حيث جرى تقسيم العينة إلى مجموعة ضابطة وأخرى تجريبية من الإناث ومجموعة ضابطة وأخرى تجريبية من الذكور. **النتائج:** أظهرت نتائج الدراسة وجود فروق ذات دلالة إحصائية في المتوسطات الحسابية لأداء الطلبة من عينة الدراسة على اختباري القراءة الناقدة والإبداعية البعديين تعزى إلى استخدام استراتيجية العصف الذهني ولصالح المجموعة التجريبية. كما أظهرت نتائج الدراسة عدم وجود فروق ذات دلالة إحصائية في المتوسطات الحسابية لأداء الطلبة من عينة الدراسة على اختبار القراءة الناقدة البعدي للجنس. هذا وأظهرت نتائج الدراسة وجود فروق ذات دلالة إحصائية في المتوسطات الحسابية لأداء الطلبة من عينة الدراسة على اختبار القراءة الإبداعية البعدي تعزى إلى الجنس وإلى صالح الإناث.

الخلاصة: يحسن العصف الذهني مهارات القراءة الناقدة والإبداعية باللغة العربية عند الطلبة. توصي الدراسة مدرسي اللغة العربية بتطبيق استراتيجية العصف الذهني على عدة كتب مقررة للغة العربية ولصفوف أخرى مع التركيز على فئة المراهقين. **الكلمات الدالة:** العصف الذهني، فهم المقروء، طلبة الصف السابع، المستوى الناقد، المستوى الإبداعي.



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Introduction

The continuous and fast information technology aspects of educational environment in Jordanian schools and universities urge both teachers and students to achieve better reading habits. Education policy makers in Jordan do their best to establish quality assurance elements at many different levels. Some global views on developing students' different language skills target teenager students. This could be like training them at earlier age to develop skills of self-learning, critical thinking, creative thinking and problem solving. Jordanian Educational institutions' roles need redefinition. Teaching and learning processes become actions that lead to transforming students' roles from knowledge-oriented to skill-oriented. This could prepare students to face an 'ongoing complicated environment' (Oweidat, 1999). Preparing students include creating opportunities for creative thinking that leads to prosperity and development (Al-Essawi, 2004). Developing better reading habits fosters judging things, giving options and suggestions, and discussing different views. This refers to a process of deeply and comprehensively changing or at least modifying students' behavior to become more efficient to utilize and invest all their abilities innovatively and creatively. That is why one ultimate learning outcome for young learners becomes developing their thinking skills.

Reading comprehension skill in Arabic at critical and creative levels changes to be a tool that builds up and enhances creation and innovation, not only retention and repetition. Lafi (2012) refers to comprehension resulting in composing readers' personal views and options to solve problems even in a more creative way. This leads us to redefine reading as a learning tool that helps students to interpret texts and their semantic signals. A student reader participates in a dialogue with the text and asks different questions to infer judgments. In this way, the student reader upgrades reading comprehension skills both critically and creatively with higher levels of thinking. Reading skills are mainly for comprehension that develops with more reading practice.

With a lot of reading practice, a critical and creative student reader follows a set of cognitive procedures such as analyzing, making judgments, and inferring. Reading comprehension creates an interaction that builds up meaning based on text information, student background knowledge and 'stylistic features of the writer', Abdul Bari (2010). What makes reading comprehension easier for students includes training them to use such cognitive procedures every now and then. If a student reads and understands a text properly and accurately, developing reader personal views and character will continue. In this sense, the student reader becomes aware of the writer's messages conveyed through the text. This leads to developing the reader's skill of accepting and rejecting writer's views reasonably. Word meaning, sentence meaning, connection of different meanings, and ordering information in a logical sequence play a role in moving these different meanings and ideas to the reader's everyday life, Al-Naqah and Hafez (2002). Students in different educational stages can comprehend better if they underline main ideas, grasp the general theme, and select important details. When they practice this more and more, they become more mature readers who connect better background knowledge with ideas in the text. They become more accurate, good researchers who seek meaning from in between the lines.

Teaching reading in Jordanian context needs to focus more on building up thinking skills. This trend in teaching reading could pave the way to other reading types: critical reading and creative reading. Critical reading turns acquiring knowledge from a passive process to be a cognitive activity that leads to a better content knowledge. This content knowledge makes students' absorption of large quantities of information easier. There would be enough time to train students on other cognitive skills such as applying logical evidence that result in a creative image of the text. This creative image helps students control their thinking and then make the right decision in their everyday life, Paul (1995). In addition, as students imagine about the text ideas, they can create and innovate their own hypotheses and prove them true by evidence.

Critical readers could become aware of the importance of accurate understanding, of developing the sense of contemplation, and of positive interacting with the text. They are open-minded in that they tackle the reading comprehension text from different angles and views. They infer implied and semi-implied meanings; take sufficient time to think about ideas and to connect them with personal previous knowledge. Moreover, they distinguish facts from opinions, think more logically, accept new ideas, and judge by evidence. Consequently, critical readers become 'influential characters' who take decisions independently and who are able to criticize opinions and ideas, Mefleh (2005). In this sense, critical readers will

never adapt negative opinions and ideas that invade them culturally nor intellectually.

Creative readers may think and contemplate out of the box. They discover that new visions based on hypothesizing and making inferences, Robertson and Rane-Szostak (1996). They function different types of thinking to comprehend, go beyond facts and their meanings, explain and interpret implications deeply. In addition, they react to the text in different new ways that lead to different predictions and probabilities. This results in building up the reader's self-confidence in solving different complicated problems. Creativity in reading comprehension extends the reader's thoughts and visions. Willson & Preper (2004) pointed out that modern educational systems should focus on providing readers with higher thinking skills and on using education technology. This changes learners' roles from knowledge consumers to knowledge producers. Student readers actively research and discover rather than receive knowledge. In this sense, students depend on themselves in taking information, commanding necessary skills and forming their personal attitudes and values. Brainstorming is one teaching strategy that could train students to become critical and creative readers.

Critical and creative reading skills could develop through brain storming teaching strategy. This strategy asks students to participate and interact with the text both cognitively and affectionately. It may give the opportunity for students to discover linguistic and mental stimuli in the text, learning and teaching problems in classroom, different forms of reading weakness and independent personal features. Selley (2000) asserted that brain storming teaching strategy gives the chance for readers to express their ideas freely. It also leaves a room for reader's independence and motivation if it works clearly. Different thinking skills could be developed in classroom environment if is used functionally. First, teachers suggest ideas then present them for discussion. Second, students function their skills in ordering and classifying these ideas for criticism. Finally, a student judges and problem-solves what he/she reads logically. Student readers will feel that their personal ideas could be subject to criticism. Therefore, they will face other ideas courageously depending on their self-confidence and on text pieces of evidence. The more ideas discussed and criticized the more accurate and precise the judgment will be. In this sense, students become more imaginative and ideas producer. Consequently, students may develop the skills of giving opinions, proving judgments by evidence and then leading a constructive criticism.

In this study, there are some concepts that the researchers need to define operationally. These concepts include teaching strategy, teaching method, brainstorming, reading comprehension, critical reading, and creative reading. The definitions could create a clear image of the setting in the classroom understudy.

First, a teaching strategy is a set of procedures and techniques used by Arabic language teachers in Jordan to help students get benefit from planned learning experience to achieve the pre-planned educational goals. Second, a teaching method refers to how Arabic language teachers in Jordan convey the learning content to students in classroom. Third, brainstorming is a teaching strategy that depends on organizing students in one group and on urging their brains to respond and generate as many ideas as they can. This is through giving them the opportunity to think about topics and problems in classroom and by leading more discussions. Fourth, reading comprehension is a mental process based on connecting reader's background knowledge to the written symbols. This includes vocabulary building from the text, understanding words in context, recognizing sentences in paragraphs, and identifying paragraphs minor topics related to the whole text topic. Fifth, critical reading is the readers' ability to interact consciously with the components of the reading text to build up critical, personal opinions and views and to reach reasonable judgments about what students have read. The researchers can measure this by the mean of scores of students' grades in the critical reading test prepared by the researchers. Sixth, creative reading is the readers' ability to reread the text with fluent, flexible, original and problem-solving manner. The researchers can measure this by the mean of scores of students' grades in the creative reading test prepared by the researchers.

Literature Review

Some language teaching textbooks do not infuse critical nor creative thinking in their activities. Other textbooks do, but unfortunately; teachers sometimes ignore such activities. Moreover, because different publishing companies cover a wide variety of teaching programs, Narramore (1992) examined the creative thinking effects of selected commercially published social studies curriculum materials. That was from Harcourt Brace Jovanovich (HBJ) social studies program for fifth grade students. The program was entitled "The United States: Its History and Neighbors". The researcher selected an experimental

group and a control group from fifth grade students who were approximately 25000 students. The Torrance Tests of Creative Thinking (TTCT) were pre and posttests. They carried out analysis of the creative thinking HBJ activities. The collected data were analyzed statistically using analysis of variance and comparing of adjusted posttests means. The study revealed that there were statistically significant differences in creative thinking between the experimental group and the control group students. The study also revealed that female students of the experimental group achieved higher adjusted posttest means than the females of the control group. Finally, the study results showed that male students of both control and experimental groups achieved far much better than the females of the experimental group.

Darayseh (2003) investigated the effect of a proposed program based on semantic mapping and brainstorming on developing English writing abilities for first secondary students in Jordan. The sample of the study consisted of 212 students divided into three male sections and three female sections at random. The researcher assigned two groups: one control group and another experimental group. The researcher proposed a writing program, and established the required validity and reliability. The researcher taught the experimental group students with semantic mapping and brainstorming teaching strategies. The results of study showed that there were statistically significant differences between the mean of scores of male and female students and in favor of the females. In addition, the results of the study revealed how important is brainstorming in building up students positive attitudes towards writing skill. Finally, the results showed that there were no statistically significant differences between control group students and experimental group students due to the interaction between gender and any of the two teaching strategies.

Al-Ajarmah (2006) examined the efficiency of cooperative learning and brainstorming teaching strategies in acquiring oral composition skills of tenth grade students in Jordan. The sample of the study consisted of 153 tenth grade students from the government schools in Madaba Directorate of Education. The researcher divided the sample into two experimental groups and one control group. The researcher carried out content analysis of the composition, summarized textbooks and identified the lessons that develop oral composition skills. Then, the researcher carried out a content modification to apply cooperative learning and brainstorming teaching strategies. The researcher gave a pre-post oral composition test for the three groups of the study. The results of the study revealed that there were statistically significant differences between the mean of scores of the control group students and the mean of scores of the two experimental groups on the oral composition posttest and the second experimental group. In addition, the results revealed that there were no statistically significant differences between the control group students and the two experimental groups due to gender.

Al-Hayek (2016) aimed at recognizing the effect of an instructional program based on the strategies of brainstorming and vocabulary lists on the development of the creative reading skills among tenth grade female students in Jordan. The sample of the study consisted of 60 female students from Mafraq Directorate of Education. The sample students were from one-government females' school. The researcher divided the sample into two equal groups: one control group and one experimental group. The researcher designed a creative reading pre and posttest and an instructional program based on brainstorming and vocabulary lists. The results of the study revealed that there were statistically significant differences between the mean of scores of the control group students and the mean of scores of the experimental group students on the creative reading posttest and in favor of the experimental group.

Mansi (2016) explored the effects of brainstorming strategy in developing critical reading skills for sixth grade students in Jordan. The sample of the study consisted of 125 students of the sixth grade. The researcher purposefully selected students from two schools. Then, the researcher divided them into two groups: one control group of 60 students and one experimental group of 65 students. The researcher designed the achievement pre-posttest, an attitude-measuring tool, and a teaching method based on brainstorming strategy. The results of the study revealed that there were statistically significant differences between the mean of scores of the control group students and the mean of scores of the experimental group students on the creative reading posttest and in favor of the experimental group. Moreover, the results showed more developed positive attitudes toward reading among the experimental group students.

Malkawi and Smadi (2018) identified the effect of using brainstorming in teaching English grammar at public schools in Jordan. The population of the study consisted of 1634 male and female sixth graders. The sampling was in a random

stratified manner and represented four schools: two for males and two for females. These groups were one control group and one experimental group. The control group consisted of 114 students and the experimental group consisted of 120 students. The results of the study showed significant differences between males and females in the achievement test in favor of the females. The study also concluded that brainstorming raises students' abilities and enhances positive interactive relationship between the teacher and the students. The study strongly recommended using brainstorming as a remedy for students' weakness in studying grammar. According to the study, brainstorming is highly recommended to narrow the gap between students learning English grammar and their teachers using traditional methods of teaching grammar.

Al-Zyud (2019) investigated the effect of the brainstorming strategy on the achievement of reading and writing skills among the fourth-grade students in Jordan. The sample of the study consisted of 141 students and they were one control group and one experimental group. The researcher used a silent reading test, a verbal reading test, a functional writing test and a creativity-writing test. The results of the study showed that there were statistically significant differences in reading and writing skills, which were due to the brainstorming strategy in favor of the experimental group. The researcher recommended using brainstorming in teaching both reading and writing skills for fourth-grade students.

Al Masri (2019) identified the effect of using brainstorming in the development of creative thinking and achievement in English language among the 10th grade students at King Abdullah II School of Excellence. The sample of the study consisted of 168 students, and they were a control group and an experimental group. The researcher designed the tools of the study: a creative thinking test in English and an achievement test in English language. The researcher applied the pre-posttest study tools to both groups. The results of the study revealed that there were statistically significant differences between the mean of scores of the experimental group and the control group in the pre-posttest of creative thinking. The results also revealed that there were statistically significant differences between the mean of scores of the experimental group and the control group in each sub-skill of creative thinking (fluency, flexibility, and originality) in the creative thinking pre-posttest. Moreover, the results showed that there were statistically significant differences between the mean of scores of the experimental group and the control group in the English language achievement test.

Holmes (2013) clarified the differences between males and females interactions with each other. Guis et al (2020) found out that there were potential differences in the experiences of men and women during brainstorming. Women spoke up less and were less likely to contribute in equal proportions in men dominated teams. When women make up half of the brainstorming team, their interpersonal interactions become supportive with a wider range of ideas. When more women were on a team, sharing ideas moves more freely. Brainstorming enhanced creative thinking levels among both male and female middle school children. (George, 2016).

On reviewing the results of the selected studies above, the researchers of this study noticed that brainstorming strategy has a positive effect on improving critical reading, oral composition and writing skills, and critical thinking in general. In most of these studies, there were some suggested programs or strategies to improve critical reading. The suggested strategies focus on developing critical and creative reading skills in one way or another. Brainstorming was the main strategy in the majority of these studies. These studies were from Jordan. Gender was not a variable in most of the studies; it was a neutral variable (Al-Ajarmah, 2006), and it was in favor of females (Darayseh, 2003) and (Malkawi and Smadi, 2018). All of the studies focused on the importance of developing critical and creative skills among students in different school environments. They guided the researchers of the current study to examine the effectiveness of using brain storming teaching strategy to develop critical and creative reading comprehension levels in Arabic language. Moreover, they help the researchers in building up the instruments of the current study. Having reviewed these local studies on brainstorming, the researchers of this study believe that there could be an addition of something new to the context of using brainstorming in teaching Arabic in Jordan.

The Statement of the Problem

Based on views of Arabic language teachers' in classroom, the researchers decided to explore reading comprehension in Arabic. About 84 Arabic language teachers in Irbid Directorate of Education think that reading comprehension in Arabic for many students who are native speakers of Arabic in Jordan could be a sort of suffering. This suffering for students

represents general weakness in treating and processing reading passages with very low levels of critical and creative comprehension. This situation of reading comprehension in Arabic language classes makes it difficult to improve students' critical and creative skills. Written words in a text may present a problem that needs readers to solve; this what our students need to develop. Based on this suffering and through applying brainstorming strategy, teachers could use it as a helpful teaching reading strategy.

The Questions of the Study

The study aims at answering the following four questions:

- 1- Does the seventh grade students' performance in Arabic critical reading test differ depending on using brainstorming strategy or not?
- 2- Does the seventh grade students' performance in Arabic critical reading test differ depending on gender or not?
- 3- Does the seventh grade student's performance in Arabic creative reading test differ depending on using brainstorming strategy or not?
- 4- Does the seventh grade students' performance in Arabic creative reading test differ depending on gender or not?

The Significance of the Study

This study deals with Arabic reading comprehension for teenagers and puts it under focus. Because adult students also have problems with critical and creative levels of comprehension, this research work goes deep with teenager students to help them overcome such problems later on. This study draws teachers' attention to the importance of brainstorming in teaching reading. It aims at developing critical and creative skills for students interactively. The interaction between students and teachers in the form of brainstorming could generate different ideas and could connect students with reading material creating reader-text intimacy before reading. The study also depends on receiving students responses to different linguistic and cognitive stimuli from the text creating self-dependence and meeting students' needs while reading. More concern and focus on developing students' critical and creative thinking skills could build in both teachers and students after reading. This study could be the first in Jordan to deal with critical and creative levels of reading comprehension in Arabic as a school subject in Jordanian government schools. For the first time, brainstorming strategy is under study with reference to gender, critical and creative reading comprehension levels in Arabic. This is the first time in Jordanian context of teaching Arabic reading skills, when brainstorming urges all students to respond to a reading comprehension text by presenting views and ideas on a certain topic both critically and creatively. Students under study put social inhibitions away with a focus on generating new solutions and opinions. They become more active in contributing to their flow of ideas. Teachers pose questions; draw students' attention to a problem after reading to introduce a certain topic. This encourages students to accept and respect individual differences and to involve divergent thinking. Finally, the study promotes building up students' individual thinking and self-confidence. This is what most of student-centered teaching activities support and consolidate.

Method

The Sample of the Study

The whole population of the study was 7045 seventh grade students from Irbid Directorate of Education for the academic year 2021/2022. The students were in 43 schools and in 125 classrooms. Male students were 3271 in 19 schools, and female students were 3774 in 24 schools. Out of this whole population, the researchers randomly selected four classrooms from four schools as a sample. The randomly selected sample consisted of two male classrooms and two female classrooms. Males in the two classrooms were 80 students equally and randomly divided into a control group and an experimental group. Females in the two classrooms were 87 students divided randomly as 44 students in the control group and 43 students in the experimental group as shown in table (1) below:

Table (1): The distribution of the study sample according to teaching strategy, gender and school

Teaching Strategy	School	Gender	No. of Students	No. of Classrooms
Teachers' Book	Omar Bin Abdul-Aziz	Males	40	1
Brainstorming plan	Omar Bin Abdul-Aziz	Males	40	1
Teacher's Book	Akka for Girls	Females	44	1
Brainstorming plan	Akka for Girls	Females	43	1
Total			167	4

Instruments of the Study

As this study follows the quasi-experimental research, the researchers designed a survey slip question to 150 Arabic language teachers see appendix (A), a brainstorming teaching plan with reading comprehension passages, and two pre-posttests in order to measure the levels of critical and creative reading skills. In order to measure the critical reading level, questions of the pre-posttests revolve around the author and the source of the reading passage, any piece of evidence on the author's support for views in the text and whether students think about the author's assumptions and beliefs. In addition, to measure the creative reading level, other pre-posttests questions ask students to differentiate between facts and opinions, to identify important ideas and to understand deeply to solve problems.

The survey slip question was simply "Do you think that reading comprehension could be a sort of suffering for your students? Why? Why not?" The teaching plan contains nine reading comprehension texts: one from the Holy Quran, one from an encyclopedia, one from an autobiography, one from the ministry of tourism in Jordan, one from a translated book, two from poetry, one from a research center, and one from an Arabic novel. These components are similar to the reading comprehension texts in the students Arabic textbooks. There were nine pairs of classes in the teaching plan: one class for discussing and brainstorming the text and another class for reading and comprehension of the text. The pre-post critical reading test has 30 multiple-choice items, with a short paragraph followed by three items. Each paragraph represents a critical reading skill. Each group of three items has an objective measuring a certain critical reading skill. The pre-post creative reading test has 20 multiple-choice items with a short paragraph followed by two items; one of them asks students to choose an image. The student has the chance to write why he/she made his choice. Problem solving has five questions, fluency has five questions, flexibility has five questions, and originality has five questions.

Procedures of the Study

First, the researchers checked the content validity of the teaching plan by giving it to a jury that consisted of one faculty staff member in Arabic language from the Hashemite University, two Arabic language supervisors in Irbid Directorate of Education, and 17 well-experienced Arabic teachers. The jury members wrote down their views on the suitability of the teaching objectives, teaching aids, activities and teaching procedures, and formative and summative evaluation in the plan. The researchers took most of the remarks and suggestions of the jury into consideration. The researchers carried out modifications, omissions and restructuring processes. After a careful reviewing in the light of the insightful remarks, the researchers sent the teaching plan again to the jury for double-checking. Two weeks after, the jury approved the teaching plan.

Second, to check test validity, the researchers asked the jury to reflect on the critical reading and the creative reading concepts and the relationship between them, on behavioral signals that show whether the students has the critical and creative skills or not, and on the multiple choice items of the pre-posttests. The 17 well-experienced teachers checked to what extent do the pre-posttests items match with the seventh grade Arabic textbook objectives. They redistributed the pre-post reading test's items to cover the following areas: author information (three items), source book (two items), author's support for ideas (two items), and thinking about author's assumptions (two items), problem solving (two items), identifying main ideas (two items), and differentiating facts from opinions (two items), see Appendix (A). They also checked how varied the items of the pre-post critical reading test are. The researchers distributed the pre posttests to students before and after using brainstorming strategy. They read aloud all test's items and explain each one in details for all students so that they become very clear. Both pretest and posttest started at 9:00 a.m. in the same classrooms with even seating students in

the same desks with the same classroom environment.

Third, the researchers took the necessary prior permission from Irbid Directorate of Education to conduct the study as the random sampling process assigned Omar Bin Abdul-Aziz School for Boys and Akka School for Girls. The researchers visited both schools and talked to their administrations presenting the objectives and plan of the study. After that, the selected sample of students in both schools took the pre-posttests. The researchers then helped students get rid of all concerns and worries by assuring students that the tests will not be achievement tests at school and that all their personal information will be secret. Both researchers clarified and explained everything about the test before taking it. Each test took about 45 minutes. This happened two weeks before conducting the study. To check the equivalence of groups in their performance on the critical reading test, the means of scores and standard deviations of the participants of the sample on the critical reading pretest and gender gave the following calculations as shown in table (2) below:

Table (2): The mean of scores and standard deviations of students' performance in the critical reading pretest

	Control group		Experimental group		Total	
Gender	mean	std. deviation	mean	std. deviation	mean	std. deviation
Males	7.37	2.40	6.97	2.09	7.15	2.22
Females	7.21	2.00	7.25	3.45	7.23	2.81
Total	7.28	2.17	7.18	2.85	7.20	2.39

Test is out of 30

Table (2) above shows that there were clear differences between the mean of scores of the students in the study sample. A Two-way ANOVA identified how significant are these differences as in table (3) below:

Table (3): The two-way ANOVA of the mean of scores of students' performance on the critical reading pretest

Source of variance (SV)	Sum of squares (SS)	df	Mean of Squares (MS)	F	Sig.
Teaching strategy	0.118	1	0.118	0.018	0.894
Gender	1.017	1	1.017	0.155	0.694
Error	778.779		6.544		
Total	781.317		* sig. $\alpha=0.05$		

Table (3) shows that there were no significant differences at $\alpha=0.05$ between the means of scores of the students' performance on the critical reading pretest due to gender. This also shows that students are equal in their background experience and abilities in critical reading skills before applying the teaching plan.

To check the equivalence of groups in their performance on the creative reading test, the means of scores and standard deviations of the participants of the sample on the creative reading pretest and gender gave the following calculations as shown in table (4) below:

Table (4): The mean of scores and standard deviations of students' performance in the creative reading pretest

	Control group		Experimental group		Total	
Gender	mean	std. deviation	mean	std. deviation	mean	std. deviation
Males	6.90	1.08	6.60	1.03	6.76	0.95
Females	6.56	0.96	6.70	1.13	6.63	1.06
Total	6.71	0.96	6.65	1.07	6.68	0.99

Test is out of 20

Table (4) above shows that there were clear differences between the mean of scores of the students in the study sample. A Two-way ANOVA identified how significant are these differences as in table (5) below:

Table (5): The two-way ANOVA of the mean of scores of students' performance on the creative reading pretest

Source of variance (SV)	Sum of squares (SS)	df	Mean of Squares (MS)	F	Sig.
Teaching strategy	5.189	1	5.189	0.164	0.687
Gender	13.967	1	13.967	0.440	0.508
Error	3776.587		31.734		
Total	3835.626				

* Sig. $\alpha=0.05$

Table (5) shows that there were no significant differences at $\alpha=0.05$ between the means of scores of the students' performance on the creative reading pretest due to gender. This also shows that students are equal in their background experience and abilities in creative reading skills before applying the teaching plan.

Fourth, to check the reliability of the pre-post tests and their internal consistency, a Cronbach's alpha reliability coefficient was calculated. This was on a pilot sample of 25 students from the study population. The values of the coefficient for the critical reading pre-posttest and the creative reading pre-posttest were 0.85 and 0.88 respectively. Both values are high and show that both tests are reliable enough. In order to achieve a more reliable correction process, the researchers asked three teachers to correct and double-check correction. The researchers classified answer papers as female/male. Then the researchers saved three copies of each answer paper. Each teacher took a copy to correct at the same time. An answer key guided the three teachers. The three teachers have calculated the average of the three grades of the three teachers for each student. Finally, to check the reliability of the correction process, the researchers calculated the Pearson correlation coefficient and coefficient of contingency as shown in table (6) below:

Table (6): The correlation coefficients of the grades of the three correcting teachers

Correlation	Correcting Teacher	1	2	3
Pearson	1	-	0.82	0.75
	2	-	-	0.87
	3	-	-	-
Contingency	1	-	0.83	0.78
	2	-	-	0.89
	3	-	-	-

Table (6) above shows that the correction process was very reliable as the Pearson correlation coefficient values range between (0.75-0.87) and the contingency correlation values range from (0.78-0.89).

Fifth, there were some classroom arrangements to facilitate applying a model brainstorming teaching strategy. The Students sit next and opposite to each other under their teacher supervision and guidance. The teacher can easily move between students and very smoothly. In each class, the teacher summarizes very briefly what students should do and how. First, the teacher puts a relevant problem under open discussion according to the text. Second, the teacher wrote all of the students' ideas and solutions on the classroom board. Third, a classification and omission process shows how to keep the most relevant ideas. Finally, the students reorder and review best solutions and ideas that help them read more critically and creatively with a very continuous and positive feedback from the teacher.

Results and Discussion

First, the seventh grade students' critical reading performance improved due to using brainstorming strategy and was different from their performance in the pretest. The means of scores and standard deviations of the participants on the critical

reading posttest were calculated and showed some clear differences. Table (7) below shows that there were significant differences between the mean of scores of the students on the critical reading posttest after applying the teaching plan.

Table (7): The ANOVA of the mean of scores of students' performance on the critical reading posttest and teaching strategy

Source of variance (SV)	Sum of squares (SS)	df	Mean of Squares (MS)	F	Sig.
Teaching strategy	0.665	1	0.665	0.101	*0.004
Error	898.239		6.544		
Total	951.356				

* Sig. $\alpha=0.05$

Table (7) shows that there were significant differences at $\alpha=0.05$ between the means of scores of the students' performance on the critical reading posttest due to using brainstorming strategy. This result is in conformity with other local studies on brainstorming positive effect to develop reading comprehension, Al-Hayek (2016), Mansi (2016), Al-Zyud (2019) and Al Masri (2019). The figures in table (7) could show that teenager students continue to build up their general knowledge as they grow up. Having a wide range of topics for reading exposes them to more information that raise their emotional intelligence. Teacher's guidance on picking up critical pieces of information could also make a difference. It becomes very clear that brainstorming strategy develops teenager students' critical reading skills.

Second, the gender variable does not affect the students' performance on the critical reading posttest. The seventh grade students' performance on the critical reading posttest does not change due to the gender of the students. Table (8) below shows that there were not any significant differences at $\alpha=0.05$ between the means of scores of the students' performance on the critical reading posttest due to gender.

Table (8): The ANOVA of the mean of scores of students' performance on the critical reading posttest and gender

Source of variance (SV)	Sum of squares (SS)	df	Mean of Squares (MS)	F	Sig.
Gender	13.967	1	15.420	0.435	0.573
Error	3776.587		35.428		
Total	951.356				

* Sig. $\alpha=0.05$

This result is different from Darayseh (2003) in the sense that there were statistically significant differences between control group students and experimental group students due to the interaction between gender and any of the two teaching strategies. This could be because developing the critical and creative levels of comprehension is more difficult than developing the skill of writing based on brainstorming. On the other hand, Al-Ajarmah (2006) showed that there were no statistically significant differences between the control group students and the two experimental groups students due to gender. Critical reading development depends on practicing reading about different topics. Males and females share the same reading comprehension material prepared to achieve better critical reading levels. Different questions cover author information, source book, author's support for ideas, thinking about author's assumptions, problem solving, identifying main ideas, and differentiating facts from opinions.

Third, the seventh grade student's creative reading performance improved due to using brainstorming strategy and was different from their performance in the pretest. The means of scores and standard deviations of the participants on the creative reading posttest were calculated and showed differences. Table (9) below shows that there were significant differences between the mean of scores of the students on the creative reading posttest after applying the teaching plan.

Table (9): The ANOVA of the mean of scores of students' performance on the creative reading posttest and teaching strategy

Source of variance (SV)	Sum of squares (SS)	df	Mean of Squares (MS)	F	Sig.
Teaching strategy	1.435	1	1.435	0.013	*0.000
Error	821.256		110.384		
Total	997.25				

* Sig. $\alpha=0.05$

Table (9) shows that there were significant differences at $\alpha=0.05$ between the means of scores of the students' performance on the critical reading posttest due to using brainstorming strategy. This result is in conformity with other studies on brainstorming positive effect to develop reading comprehension, Narramore (1992), Al-Essawi, 2004, and Al-Hayek (2016). Brainstorming strategy includes six main items: preparing a students' relaxing environment, capturing the main focal points, writing down initial ideas, looking for similar and different patterns, listing the missing aspects and generating ideas. Teachers are responsible for provoking all these items in their students' minds. Both students and teachers cooperate in brainstorming sessions to develop better creative levels of reading comprehension. This brainstorming process succeeds as it develops students' creativity in reading comprehension.

Fourth, the seventh grade students' creative reading performance improved due to gender and was different from their performance in the pretest. The means of scores and standard deviations of the participants on the creative reading posttest were calculated and showed very clear differences in favor of the females. Table (10) below shows that there were significant differences between the mean of scores of the students on the creative reading posttest after applying the teaching plan.

Table (10): The ANOVA of the mean of scores of students' performance on the creative reading posttest and gender

Source of variance (SV)	Sum of squares (SS)	df	Mean of Squares (MS)	F	Sig.
Gender	0.621	1	0.621	0.136	*0.001
Error	564.277		4.568		
Total	746.411				

* Sig. $\alpha=0.05$

Table (10) shows that there were significant differences at $\alpha=0.05$ between the means of scores of the students' performance on the creative reading posttest due to gender and in favor the females. This result is in conformity with other studies on brainstorming positive effect to develop creative reading comprehension, (Paul, 1995), (Selley, 2000), (Darayseh, 2003), (Lafi, 2012) and (Malkawi and Smadi, 2018). This result could be justified by the fact that seventh grade female students as middle adolescents start feeling more independent than males. They tend to imagine and to be more flexible, more fluent and more capable of solving problems than males. It is possible that females start using the left hemisphere of the brain, which is responsible for creative thinking at an earlier age than males. This result could be clashing with the stereotypical image that men are more creative than women are. Some recent empirical studies show that in countries with more gender equality like modern Jordan such stereotypes are less pronounced. This result could add to the body of knowledge about gender and creativity that females are more creative than males at earlier age. Therefore, they become potentially more creative readers than males or at least the same.

Conclusions and Recommendations

As this study deals with levels of reading comprehension, it concentrates on the reception of linguistic, psycholinguistic and sociolinguistic input for students. The results of the study show that brainstorming improves both students' critical and creative reading skills in Arabic. This means that brainstorming as a teaching strategy could develop these levels of reading comprehension. Gender does not influence students' critical reading skills. This could be because males and females

develop this level of comprehension by 'practice and then practice some more'. However, gender influences the performance on creative reading level of comprehension in favor of teenager females. This could be because teenager females' brain reaches its biggest size around 11 years old, and for teenager males' brain around 14 years old. In this sense, with seventh graders in this study females have better abilities to imagine and contemplate. In the light of this study's results, the researchers suggest that brainstorming enhances both critical and creative levels of reading comprehension among teenage students. Teacher's corrective feedback directed in classroom benefits both male and female students. In addition, gender can play a role in reading creativity in favor of females. Pedagogically, teachers need to assign brainstorming groups or pairs depending on students' linguistic levels.

In the light of the results of the study, the researchers recommend the following:

- 1- Educational supervisors and teachers are encouraged to implement the brainstorming strategy plan on other Arabic language textbooks for other grades with concentration on teenagers.
- 2- Teachers or textbook authors have to take a balanced teaching content that mixes critical and creative reading skills when they select a reading comprehension material.
- 3- Arabic language teachers and even other school subjects' teachers need to keep an ongoing professional development on brainstorming as teaching strategy.
- 4- The Ministry of Education in Jordan needs to supply teachers' books with brainstorming class sheets and model brainstorming plans.
- 5- The researchers encourage conducting more studies on brainstorming effect and its pros and cons while teaching and learning even in other school subjects.

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