Deanship of Scientific Research

The Effectiveness of the 5E Instructional Model on the Academic Achievement of 9th Grade Students Towards Learning English Reading Comprehension Skills

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Abstract

Objectives: Assessing the effectiveness of the 5E Instructional Model on the academic achievement of 9th grade students towards learning English's reading comprehension skills at the Model School of The University of Jordan.

Methods: Administering pre-and post-tests to both control and experimental groups. Each group consisted of 25 students. Both groups were assigned reading lessons for six weeks with two different instructional methods i.e., the direct method and the 5E Instructional Model.

Results: The results of the post-achievement test showed a statistically significant difference between the average scores of the experimental group (10.24 ±1.1) and the control group (7.24 ± 0.07) and therefore, the E5 educational model appeared more efficient in improving students' academic achievement compared to the direct teaching method.

Conclusions: The study concludes that the E5 educational model enables students to learn and develop their reading comprehension skills by using their prior knowledge, explore new ideas and questions, self-examination and reflection.

Keywords: 5E instructional model, academic achievement, reading comprehension.

فعالية تطبيق النموذج التعليمي E5 على التحصيل الدراسي لطلبة الصف التاسع بما يتعلق بتعلم مهارات الاستيعاب الشفوي باللغة الإنجليزية في المدرسة النموذجية للجامعة الأردنية

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ملخّص

الأهداف: تقييم فعالية تطبيق النموذج التعليمي E5 على التحصيل الأكاديمي لطلبة الصف التاسع بما يتعلق بتعلم مهارات فهم القراءة باللغة الإنجليزية في المدرسة النموذجية في الجامعة الأردنية.

المنهجية: إجراء الاختبارات القبلية والبعدية على المجموعات الضابطة والتجريبية؛ حيث تألفت كل مجموعة من 25 طالبًا. جرى تعيين دروسًا للقراءة لكلتا المجموعتين بطريقتين تعليميتين مختلفتين ولمدة ستة أسابيع وهما الطريقة المباشرة والنموذج التعليمي E5.

النتائج: أظهرت نتائج الاختبار التحصيلي البعدي وجود فرق ذو دلالة إحصائية بين متوسط علامات المجموعة التجريبية (1.1± 10.24) والمجموعة الضابطة (0.07 ±7.24) وبالتالي ظهر النموذج التعليمي E5 أكثر كفاءة في تحسين التحصيل الأكاديمي للطلاب مقارنة بطريقة التدريس المباشر.

الخلاصة: تخلص الدراسة إلى أن‌النموذج التعليمي E5 يُمَكن الطلاب من تعلم وتطوير مهاراتهم في فهم القراءة باستخدام معرفتهم المسبقة واستكشاف أفكار وأسئلة جديدة والفحص الذاتي والتفكير.

الكلمات الدالة: النموذج التعليمي E5 ، التحصيل الدراسي، الاستيعاب الشفوي.

1.   Introduction:

Education is a systematic process of exchanging information or knowledge and acquiring values, norms, and beliefs that bring a significant positive change in the behavior and attitude of human beings. Sharing information and acquiring knowledge are always done through different instructional procedures and techniques. When it comes to schools, sharing such knowledge utilizing various teaching techniques is a great challenge for teachers in the classroom to help students reach their learning and academic goals (Cilliers, Fleisch, Kotze, Mohohlwane, & Taylor, 2022). During this process, teachers act as facilitators to the learning process and play a significant role in developing and growing students' cognitive abilities towards foreign language learning. To this end, teachers adopt different instructional and teaching techniques to impart knowledge in the classroom (Shidur Rahman, 2021). Teaching techniques include principles, instructional methods, and procedures through which knowledge or information is shared (Giorgdze & Dgebuadze, 2017). Sharing knowledge or information depends on the teacher and other variables, including the students' educational background, demographics of the classroom, subjects taught, and the institutional policies (Asif, Safdar, & Ali, 2020). To achieve this goal, teachers adopt various effective instructional models while teaching different English courses to their students as a foreign language in the classroom (Yuan, Liao, Wang, Kong, & Zhang, 2022).

Learning English in general and reading comprehension skills, in particular, requires much practice and conducting many exercises through different procedures and techniques (Ahmadi & Reza, 2018). The English language curriculum in Jordan for 9th grade students at the model school was designed and developed so that every student can quickly learn four basic skills: reading, writing, speaking and listening. In this regard, for students to learn and understand better, procedural methods rather than conceptual methods should be adopted to develop a positive attitude towards learning reading comprehension skills. In order to help students better develop such skills, experimental (Marpaung & Hambandima, 2018), inquiry-based (Wahono & Zahro, 2021), and cooperative learning-based (Ehsan, Vida, & Mehdi, 2019) techniques are thought to be beneficial for students.

To this end, the 5E Instructional Model is used to help students better develop their abilities to communicate and comprehend English. The Model contains different activities designed to enhance and motivate students to participate actively in the learning process. Additionally, this model enables them to develop their perceptions and constructs about the skills they need to improve by using their prior knowledge (Begović, 2020). The 5E Instructional Model was introduced to provide more effective teaching and learning processes and enhance students' learning abilities through a variety of activities. Students lead and participate in these activities while the teachers act as facilitators. The 5E Instructional Model consists of the following stages: **Engagement, Exploration, Explanation, Elaboration, and Evaluation**. These stages enable students to build a strong foundation of knowledge through active participation in different activities (Bybee et al., 2006; Mukagihana, Nsanganwimana, & Aurah, 2021).

In the first stage of the 5E Instructional Model – **engagement** - students are introduced and identified based on their prior learning experiences (Bybee et al., 2006). In the **exploration** stage, students are introduced to different reading activities and exercises to perform in the classroom. These activities actively engage the students and help them develop reading comprehension skills. In the third stage of the 5E Instructional Model, the **explanation** stage, students tend to provide comprehensible explanations to the reading material and elaborate on their strategies and techniques that enable them to perform the assigned tasks. Also, students can conclude their ideas and present their own experiences about the subject at this stage. Knowledge is shared by facilitators or the learners themselves, who can assist their colleagues in presenting a complete explanation based on their understanding of the topic. The facilitator utilizes the language to describe the students' levels of conceptions and misconceptions (Bybee et al., 2006).

In the fourth stage, the **elaboration** stage, teachers elaborate on their ideas and experiences to fulfill the gaps regarding their students' constructs. It also provides a space for students to discuss what they have learned during the class. This stage also develops a deeper understanding of the subject (Bybee et al., 2006). The last stage of the 5E Instructional Model is the **evaluation** stage, where teachers use different assessment techniques to evaluate what the students have learned. Moreover, students can also evaluate their progress during this stage which gives them a great sense of satisfaction. Additionally, this

stage also helps teachers assess the level of students learning. Usually, this is done at the end of the lesson; however, teachers can conduct it at any stage during the lesson to check up on their students' progress (Bybee et al., 2006).

1.1 Statement of the Problem:

Considering the challenges and difficulties of foreign language reading, especially the cognitive, cultural and linguistic aspects, all prove that EFL language reading is much more difficult and complicated than that in L1. (Abu Abeelih. et. al. 2021). Despite the continuous efforts exerted by researchers (Alorabi & Abdullah, 2019; Castrillón Álvarez, 2020; Chen, 2021; Lam, Hew, & Jia, 2022; Naguib, 2019; Seçer & Yücel-Toy, 2020) that aim at providing students of English with learning tools that enable them to improve their reading comprehension skills, students seem to still face difficulty in learning reading comprehension skills with the traditional teaching methods. Additionally, scarcity of research in the Arab world in general, and in Jordan in particular has aggravated the issue. In order to help students better in improving their reading comprehension skills and tackle their reading comprehension problems, learners need to identify their problems first and then think of appropriate strategies in order to improve their reading comprehension. Therefore, this study is triggered by the need to investigate the effectiveness of using the 5E Instructional Model on the academic achievement of 9th grade students at the Model School of the University of Jordan towards learning English reading comprehension skills.

Significance of the study

This research will be a helping hand for English teachers when familiarizing the students with a new learning technique which will, in turn, enhance their learning abilities (Başer, 2008). They will experience both, the positive and negative learning prospects during instructions in the classroom. It may also assist educators in general, and English language teachers, in particular in developing and improving their instructional and teaching skills. This study can be proven to be a valuable feedback reference and a way forward for students and teachers to improve learning and teaching English comprehension skills. This study will be beneficial for future researchers in the field of learning English as a Foreign Language (EFL) to bring more improvisation to the subject with different aspects.

1.2 Objectives:

The objectives of this research are as follows:

- Examining the effectiveness of applying the 5E Instructional Model by 9th grade English language teachers to improve students' reading comprehension skills.
- Investigating the impact of adopting the 5E Model on the academic achievement of 9th grade students in learning English reading comprehension skills.
- Enhancing and improving students' reading comprehension skills by adopting the 5E Instructional Model.

1.3 Research Questions:

The following are the present study research questions:

- What are the different instructional methods used by the English teachers for teaching English reading comprehension skills?
- What is the impact of applying the 5E Model on the achievements of 9th grade students in learning English reading comprehension skills?

1.4 Hypotheses

The hypotheses of the present study are as follows.

H0: Applying the 5E Model has no significant impact on the academic achievement of 9th grade students in learning English reading comprehension skills.

H1: Applying the 5E Model has a significant impact on the academic achievements of 9th grade students in learning English reading comprehension skills

2. Literature Review

According to the related literature, the 5E Instructional Model was adopted extensively to enhance students' engagement in the active learning process of various education subjects. Several researchers were concerned about investigating the

effectiveness of the 5E Instructional Model in the teaching of science subjects. (Ohn-Sabatello, 2020) examined the integration of technological tools with the 5E Model during chemistry teaching to students. The outcomes of the investigation showed advancement in students' understanding and performance in the posttest results. The academic achievement, process skill, and attitude of the 4th grade students toward the science learning using the 5E Instructional Model were evaluated by (DEMİR & İrfan, 2020). The study reported positive coreelation between students' performance and the application of the 5E model. A study conducted by (Rafon & Mistades, 2020) aimed to evaluate the implementation of the 5E Instructional Model in teaching the physics topic to Science, Technology, Engineering, and Mathematics (STEM) students. The study concluded the presence of a positive attitude of the participants toward the learning using this method. The influence of the 5E Instructional Model on the science achievement of Indian students was addressed in the work of (Ong et al., 2018). The thinking skills and peer interaction among the college students were considerably affected by implementing the 5E Instructional Model. However, there was no significant impact of the Model on the learning achievement of the students (Lu, Yang, Shi, Xue, & Wang, 2020). For the social sciences subjects, the 5E Instructional Model was adopted for population geography education. The effect of this Model on the achievement of students was examined during one academic year at the State University of Malang (Suwito, Handoyo, & Susilo, 2020). The results showed that the experimental group had significantly improved learning achievement. The results also confirmed that the learning cycle can be implemented not only on natural sciences courses but also social sciences courses. This indicates that such model, i.e., 5E is applicable to social sciences and languages learning.

On the other hand, the 5E Instructional Model emerged as a prominent method for teaching English language learning skills. This drove the researchers to pay more attention to this Model and explore its impact on students' reading skills with EFL. (Seçer & Yücel-Toy, 2020) investigated the effectiveness of the 5E Instructional Model in improving the English writing skills of the 12th grade students. Chen, (2021) studied the effects of utilizing the 5E Model on communication competence and mindset change among college students learning English as a foreign language (EFL). Similarly, (Naguib, 2019) proved the significant impact of the 5E Model on the English grammar understanding of secondary school students. This study was conducted in a girl public school in Port Said based on a qualitative assessment questionnaire. (Lam et al., 2022) proposed the integration of flipped classrooms with the 5E Instructional Model to improve the writing skills in ESL courses. The results showed a sustainable engagement of the students while overcoming the constraints associated with traditional classrooms. (Castrillón Álvarez, 2020) assessed the impact of the 5E Model on the progress of the 9th grade EFL students. It was found that the Model improved the interaction of students with various activities in the English class. Moreover, it changed the attitude of the students towards the English learning. The findings of the current research came to confirm previous results found in the literature regarding the positive impact of utilizing the 5E model in learning reading comprehension for 9th grade studemts. Additionally, the study is regarded as a further contribution to the literature towards using this model. In essence, this research confirms the applicability of this model to learning English comprehension reading skills. (Alorabi & Abdullah, 2019) discussed the effects of the 5E Model on the performance and motivation of Saudi students during the learning of English at Taif University as a foreign language. A significant positive impact of the 5E Model on the achievement of the participants was observed throughout the study.

According to the former literature, several studies were found on both the 5E learning cycle and academic achievement and attitude towards various fields of science (DEMİR & İrfan, 2020; Lu et al., 2020; Ohn-Sabatello, 2020; Ong et al., 2018; Rafon & Mistades, 2020). However, few studies were dedicated to investigating the effects of the 5E learning cycle on learning the social sciences and humanities subjects (Suwito et al., 2020). A considerable number of studies examined the impact of the 5E Instructional Model on English learning as a foreign language (Alorabi & Abdullah, 2019; Castrillón Álvarez, 2020; Chen, 2021; Lam et al., 2022; Naguib, 2019; Seçer & Yücel-Toy, 2020). One of the studies that tackled this issue in Jordan conducted by Jubran et.al. (2014). The study investigated the level of students' awareness of the self-monitoring strategy of reading comprehension skills in Jordan and its relationship with the desire to learn. The findings of the study indicated that students showed high level of desire towards learning English comprehension. Self-monitoring strategy for learning to read appeared to be moderate among the students. Further, gender of the students appeared to be

significant between self-monitoring strategy and the desire to learn in favor of females. However, there is a lack of studies directed to investigating the effectiveness of this model in the teaching of EFL in the Arab world in generl. Therefore, this study aims to evaluate the effectiveness of the 5E Instructional Model on the academic achievement and attitude of 9th grade students towards learning English's reading comprehension skills at the Model School of the University of Jordan.

3. Methodology

Study Design: A Quasi-Experimental method was used to assess the effects of 5E Instructional Model on the academic achievement of 9th grade students while learning English reading comprehension skills. The Quasi-Experimental test was conducted on both the control and experimental groups. Each group consisted of 25 students. For six weeks, both groups were assigned lessons with two different instructional methods: the direct method and the 5E Model. Results of the lessons assigned to the control group were tested using the direct method. In contrast, the results of the lessons assigned to the experimental group were tested using the 5E instructional method.

Settings: Model School of the University of Jordan.

Duration: October to November 2021

Sample Size and Technique: A sample size of 50 9th grade students was taken from the Model School of the University of Jordan using a random sampling technique.

Study Tool: An English reading comprehension achievement test tool was utilized to assess the effectiveness of applying the 5E Instructional Model on the academic achievements of 9th grade students. The English achievement test was centered on measuring students' reading comprehension skills. Further, to measure the quality of the research tool, validity and reliability that were used, opinions of four subject specialists were taken to check the validity of the research tool. All specialists showed approval with some amnedments that can be conducted in order to truly measure the level of the comprehension of the students. Further, Cronbach alpha was used to check the reliability of the research tool.

Data Collection Tool: Data was collected through an English Reading Comprehension Achievement Test to measure reading comprehension skills. The test consists of 10 questions for the measured skill. The test was mainly based on providing students with three passages for reading extracted form the 9th grade English curriculum. The texts were approximately 250 words length each. The test included multiple (10) choice questions on each that were used to check students comprehension of the material. The questions were carefully designed and validated by four experts so as to ensure the reliability of the scores of the students. Further, the quasi-experimental test was applied to both the control and the experimental groups. The English Reading Comprehension Achievement Test was designed to check students' improvement in the reading comprehension skills. The importance of administering this test is that it reflects current developments in the teaching and learning of reading comprehension. For this particular purpose, the test is primarily designed to help English classroom teachers determine achievement levels in reading comprehension, and to indicate possible challenges, difficulties, and gaps in learning.

Data analysis: Responses to the collected data were analyzed through different qualitative and quantitative techniques. SPSS version 22 was used for quantitative data. Mean, standard deviation, and t-tests were applied to analyze the quantitative data.

4. Results and Discussion

In order to investigate the impact of the application of the 5E model on students' improvent regarding their reading comprehension skills, the sample's distribution needs to be outlined and discussed. The following table (4.1) shows the frequency distribution of the respondents out of a sample Size of 50 students

Table 4.1: Frequency Distribution of the Respondents out of a Sample Size of 50

Gender	Frequency	Percentage
Male	30	60
Female	20	40

Table 4.1 indicates the distribution of the participants in the study based on their gender. The total number of students who participated in this experiment was 50 (30 Male, 20 Females). Male respondents equaled 60%, and the remaining 40% were female respondents for the present research.

In order to draw conclusions supported by statistical figures which are based on students' performance (the control group and the focus group), the following table shows the descriptive statistics of control group and experimental group pretest Mean score.

Table 4.2: Descriptive Statistics of Control Group and Experimental Group Pretest Mean Score

Test	Group	N	X	S	Sd	T	P
PAT	Control Group	25	7.26	0.91	54	-0.12	0.85
	Experimental Group	25	7.22	0.98			

Table 4.2 shows the pre-test mean score for the control and experimental groups to assess the academic achievement of 9th grade students while learning English reading comprehension skills based on the English achievement test. The analysis shows that the values of both groups are very close to each other. Further, the t-test value ($t = -0.12$) according to the value of the level of meaningfulness ($p \geq .05$) shows that there is no significant difference between the pre-test values of both the control and experimental groups.

The post-test scores are of paramount importance that provides substantiated evidence about the statistical difference regarding the impact of the application of the 5E model, the following table shows the respective results of the post-test results.

Table 4.3: Descriptive Statistics of Control Group and Experimental Group Posttest Mean Score

Test	Group	N	X	S	Sd	t	P
PAT	Control Group	25	10.26	1.02	54	5.32	0.00
	Experimental Group	25	12.22	1.13			

Table 4.3 indicates the statistics of the control and experimental group post-test mean score to assess the academic achievements of 9th grade students while learning English reading comprehension skills based on the English achievement test. The analysis results show that the values of both groups indicate a significant difference. Further, the t-test value ($t = 5.12$) according to the value of the level of meaningfulness ($p \leq .05$), it appears that the control group and the experimental group post-test values show a significant difference in the results of the students. According to the achievement test results, the experimental group with students under the Instructional Model showed better academic achievement in learning English reading comprehension skills than the other group with direct teaching methods.

Discussion:

The pre-test results show that the control and experimental groups have almost similar values. The value of the achievement test for the experimental group is 7.22, while it is 7.26 for the control group. Therefore, by keeping in mind the values of the pre-test results of both groups, it appears that there is no significant difference between them. Students of both groups are considered equally successful in improving their reading comprehension skills when assessed before

applying the 5E Model. After applying the post-test, however, the analysis shows that the control group and the experimental group have a very significant difference in test results values. For the experimental group, the achievement test value is 12.12, and for the control group's achievement test, the value is 10.26. Indeed, this is a significant difference in the values of the post-test results between both groups, where students of the experimental groups are considered more successful than the control group in improving reading comprehension skills (Başer, 2008).

The results of the present study indicate that the 5E Instructional Method is an effective tool for improving the academic achievement of English foreign language students. It also indicates that this Model has improved and positively impacted their attitude toward learning English. The analysis results are consistent with previous findings reported by Newby (2004) and Altun, Yalcimet et al. (2010). They showed that the 5E Instructional Model is a more effective tool for improving students' academic achievement in learning reading comprehension skills.

Table 4.4: Hypotheses Test Result

H0: applying the 5E model **H0:** applying the 5E Model has no significant impact on the academic achievements of 9th grade students in learning English reading comprehension skills.	**Rejected**
H1: applying the 5E Model has a significant impact on the academic achievements of 9th grade students in learning English reading comprehension skills	**Accepted**

According to the hypotheses results and based on the Quasi-Experimental test score, the existing Null Hypothesis is rejected. Moreover, the existing Alternative Hypothesis, the "usage of 5E model has significant effects on the academic achievements of 9th grade students in learning English reading comprehension skills", is accepted.

The findings of the study indicate that the application of the 5E Instructional Model enables English language students to learn, improve, and develop their skills in reading comprehension by using their prior knowledge, exploring new ideas and questions, and examining and evaluating themselves. As a result, it is pertinent to mention here that the 5E Instructional Model significantly affects students' academic achievement towards learning English reading comprehension skills.

The limitations of this study can be attributed to the sample size and grade level. The number of students for each experimental and control group was limited to 25 participants. Moreover, this study was conducted at the 9th-grade level, which may affect the generalization of the data. Therefore, future work could consider a larger number of participants and include all grade levels. Moreover, there is a lack of literature on the impact of technology on adopting the 5E Model for teaching purposes. Hence, the effectiveness of the 5E Instructional Model can be further examined in classrooms enriched with technology.

The instructional implications of the study findings can be concluded as follows:

1.   This study provides an essential theoretical and practical reference for the researchers and teachers who wish to adopt the 5E Instructional Model and investigate its effectiveness for teaching English.

2.   It also emphasized the use of the 5E Model to promote English reading comprehension skills and improve students' academic achievement.

The above mentioned points can be seen as a benchmark and an effort that aims at tackling the problem of improving reading comprehension skills among EFL students in general. The test results and the analysis of these results indicate clearly that this modle can be a viable solution to the problems students encounter in their oursuit to enhance their reading comprehension level.

5. Conclusion

In this study, the 5E Instructional Model was adopted in a series of English lessons spanned six weeks for 9th-grade students at the Model School of the University of Jordan. The impact of the 5E Instructional Model on the academic achievements and attitude of the students towards learning English reading comprehension skills was investigated using the Quasi-experimental test. The direct instructional method was employed to contrast the proposed 5E model during the English lessons. The English achievement test was utilized to evaluate the development of English skills (reading comprehension) among the study groups. The results revealed a significant improvement in the reading comprehension skills of the students using the 5E Instructional Model compared with the traditional direct teaching method. Moreover, it demonstrated the active participation of the students in the class activities. However, the students found the direct teaching method boring, making them lazy and affecting their cognitive skills in the classes.

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