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The Effect of the Accompanying Enrichment Activities on Improving Critical Thinking Skills and Academic Achievement of A sample of Students at Abu Dhabi University

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Abstract

The current study sought to identify the effectiveness of the accompanying enrichment activities in improving critical thinking skills and academic achievement for (45) students at Abu Dhabi University. The study depended on the quasi experimental approach as well as the pre-post applications of tools to the same groups. An achievement test was constructed to measure the academic achievement and included three skills as follows: knowledge, comprehension and remembering, in addition to a critical thinking scale and the accompanying enrichment activities thereof. study findings indicated that there were statistically significant differences between the pre– application and post - application of the three achievement test skills (knowledge, comprehension and remembering) in favor of the post application, in addition to that there were statistically significant differences between the pre– application and post - application on the critical thinking scale in favor of the post – application.

Keywords : Enrichment Activities, Critical Thinking, Academic Achievement, Abu Dhabi University.

INTRODUCTION

The term enrichment expresses an act or behavior of great value or outstanding importance in a particular field. The enrichment of teaching indicates providing learners with non-traditional educational activities, while the units of study are unconventional. Through enrichment, it is possible to intensify the learner's information and deepen his experiences. Moreover, the enrichment activities refer to enriching the educational program and providing the learners with a new type of educational experience, which in turn differ from the experiences offered to them in the traditional classroom in terms of content, level, novelty and intellectual originality.

With the increasing problems and obstacles that prevent the individual from achieving his goals, it was necessary for a person to think critically and reflect on all his affairs in order to build the land and find appropriate solutions to his problems. Studies and theoretical frameworks confirmed the urgent need of learners to develop their critical thinking skills as one of the forms of thinking that they Through it, the learner can overcome educational problems and obtain the desired goal of his learning. Therefore, the current study discusses the impact of the accompanying enrichment activities on improving critical thinking skills and academic achievement.

Study Objectives

The current study aims to identify the impact of the accompanying enrichment activities on improving critical thinking skills and academic achievement as a main objective, in addition to other objectives as follows:

1- Creating a non-traditional educational environment that depend on enrichment activities.

2- Identifying the critical thinking skills that can be developed for the learner.

3- Improving students' academic achievement scores.

4- Shedding light on the effectiveness of enrichment activities in the educational process.

Study Importance

Significance of the current study is evident from two aspects:

Theoretical importance: This study seeks to identify all that is new in the field of modern teaching strategies, especially enrichment activities, while critical thinking and its skills are among the most important things that must be developed during the educational process. Improving critical thinking skills and raising academic achievement rates.

Applied importance: This study applies a number of enrichment activities to improve critical thinking skills for a sample of students at Abu Dhabi University and the academic achievement .

Study Terms

The study included several terms, each of which can be defined separately as follows:

A- Enrichment activities: a set of purposeful and scientifically planned procedures in light of the objectives of the curriculum, which are implemented by students under the supervision and guidance of the course professor inside and outside the classroom, who requires students to participate effectively and positively.

b- Critical thinking: the individual's ability to judge facts and opinions in light of the evidence that supports those facts, in a way that guarantees him the ability to think logically and evaluate evidence to reach sound conclusions and test both of their validity and his ability to evaluate ideas in an objective manner.

Study Problem

The study problem is that students at Abu Dhabi University need to raise their grade rates through the application of non-traditional activities that can contribute to raising their academic rates, in addition students need to develop their critical thinking skills, according to the studies of Ahmed (2019), Hassan (2019), Saqri (2019), Omar and Darraj (2018), Al-Hadabi et al. (2012), Al Saadi (2008), Ijbarh et al. (2021), Al Zabee et al. (2020), Hafez (2015), Al-Barqawi (2013). Al-Hadabi& Al-Ashwal (2012), Al-Mulhim (2012).

Study Questions

The study questions can be formulated through the aforesaid as follows:

- Are there statistically significant differences between the mean scores of the two applications, the pre and post applications, after applying the enrichment activities in the knowledge skill in relation to the achievement test?

- Are there statistically significant differences between the mean scores of the two applications, the pre and post applications, after applying the enrichment activities in the skill of comprehension in relation to the achievement test?

- Are there statistically significant differences between the mean scores of the two applications, the pre and post applications, after applying the enrichment activities in the skill of remembering in relation to the achievement test?

- Are there statistically significant differences between the mean scores of the two applications, the pre and post applications, after applying the enrichment activities in the critical thinking scale?

Study Theoretical Framework

The theoretical framework of the study can be divided into more than one axis that can be clarified as follows:

First: Enrichment Activities

The use of enrichment activities is deemed very important in enriching the educational process and increasing its effectiveness inside and outside the classroom, in addition to achieving comprehensive growth for the learner in all aspects of mental, physical, psychological and social aspects, and achieving balanced and integrated education. Moreover, the enrichment activities are considered an important element in building the learner's personality. Enrichment activities express the choices and activities that students practice according to their specific needs, inclinations and desires.

They are activities that depend in their foundations and achieve their goals on enriching learning based on what the learner has acquired from the basic curriculum, through additional information, activities, practices and skills that complement the learning processes that take place in the basic curriculum. These activities also express educational activities directed to students, with the aim of developing their abilities to understand and delve into the study material, and are carried out under the supervision and guidance of the subject's professor, such as puzzles, games, scientific anecdotes and historical anecdotes. Thus, enrichment activities are a type of activities that stimulate the students' effectiveness and their positives (Jeska. et al., 2018).

Among goals of the enrichment programs are the following ones: helping students multiply learning basic skills based on the needs of the students and not their ages, providing scientific content and learning resources that are not available in the general curriculum, exploring various fields of science and knowledge, providing opportunities for the learner to participate in the selection of content, and developing higher thinking skills and creativity, developing personal capabilities that influence overall growth, in addition to developing internal motivation towards achievement.

Omar and Darrag (2018: 323) identifies the functions of enrichment activities as follows:

- An educational psychological function: it works on developing the ability to explore and curiosity, developing scientific talents, investing time, and improving the psychological and social characteristics of the learner.

- A social function: the use and practice of enrichment activities provide appropriate opportunities to assume responsibility and cooperation, and gain confidence either in themselves or in others, in addition to respect for regulations.

- Achievement function: enrichment activities help to increase academic achievement, improve its quality, and confront according to the variety of knowledge sources the enrichment activities provide.

Enrichment activities are complementary and an extension of the general curriculum, and focus on developing higher-order thinking skills, creative and critical thinking, and effective teaching. They also include independent, free activities that depend on students and their mental levels. It is important that they become comprehensive, flexible and intertwined with other knowledge; owing to the fact that the aim of the enrichment activities is to develop the skills of the students, and to consolidate information and ideas in their minds. This contributes to the development of the learner mentally, socially and psychologically.

Caleon & Subramaniam (2007) split the enrichment activities into several types as follows:

- General exploratory activities: These are activities that include many fields and topics, hobbies, and biographies of scientists. Examples of these activities include field trips to exhibitions, museums, scientific and research centers, and seminars and lectures where scientists and experts are hosted.

- Group training activities: they target training in the skills of learning processes that are used in scientific research, and training in creative and critical thinking skills, as well as providing situations to challenge and provoke critical and innovative thinking.

Enrichment experiences and activities can be combined with the topics of the formal curriculum on the grounds that they are within the scope of the formal curriculum. The discovery activities allow students to interact with a specific person, a concept, or an object of knowledge, stimulate interest, and provide opportunities for discovery. Different thinking processes and management strategies must be learned; so that students can carry out self-directed investigations and develop products and ideas, where enrichment is achieved in several ways, including: learning centers, educational resource halls, additional courses, projects, individual and group studies, apprenticeship programs at the hands of specialists, and leadership education programs (Shaffer. 2013).

Second: Critical Thinking

There were many definitions of thinking; because scholars didn't agree on a specific definition. Some of them defined it as a mental activity, individual carried out bythrough which he studies the dimensions of the problem, studies the relationships between objects, then

studies the available information or possibilities and organizes them, then tries to understand the relationship between them and his experiences on the one hand, and between all of this and the goal that he seeks to reach on the other hand. The attempt is repeated until the individual realizes this relationship, reaching his goal, and thus solving theobjective he faces. (Brem& Boyes, 2017: 178).

There are several types of thinking: inductive thinking, deductive thinking, relative thinking, critical thinking, investigative thinking, creative thinking, intuitive thinking, meta-cognitive thinking, and visual thinking. Moreover, there are other types of thinking that include free association (fluency) and restricted association (flexibility). It can also be divided into several patterns represented in critical thinking, innovative thinking and thinking related to problem solving. It can also be divided into several forms represented in convergent thinking, divergent thinking, critical thinking, creative thinking, reflective thinking and analytical thinking (Nassar, 2009: 24).

The concept of critical thinking refers to a person's ability to analyze and evaluate ideas for the purpose of improving and refining them, as it is deemed a mental process in which the individual evaluates the information that comes to his brain. Moreover, it refers to the person's ability to solve and evaluate his problems that confront him, as the critical thinking begins with the existence of a claim or something that needs to be validated, or an idea that needs to be modified, directed and innovated. In order for a person to have the ability to think critically, he must have the ability to think logically and to deduct (Davis. et al, 2010).

Critical thinking requires a person to use the higher cognitive levels of thinking in Bloom's classification (analysis - synthesis - evaluation), as it is one of the most forms of complex thinking that attracts the attention of researchers and educators. Many scientific studies indicate that critical thinking is not linked to a certain age stage, and does not exist in man by instinct, so his acquisition is not achieved except through training, exercise and experience, through which it is possible to distinguish between hypotheses and results as well as between truth and opinion (Dixon. 2009).

Abdel-Aty (2008: 153) indicates that one of the justifications for teaching critical thinking to the learner is that he should be able to make the right decisions related to his scientific and practical future. Moreover, the critical thinking among students leads to the best understanding of the cognitive content that they study in the various courses, because learning is basically a thinking process, and teaching critical thinking enables learners to meet the requirements of the future, which will not lie in acquiring the vast amount of information and facts that they learn, but rather through acquiring logical and rational methods in deducing and interpreting ideas.

Paul (2016) indicates that critical thinking goes through three interconnected and sequential stages: the stage of analyzing the idea or the topic, the stage of evaluation for this thinking, and then ends with the stage of modifying and improving the thinking or the final product of the idea after modification and revision. Critical thinking is usually linked to creative thinking, as the Critical thinking and innovative thinking are two related concepts, as critical thinking develops different thinking skills in a person such as analysis, evaluation, judgment, problem solving and logical thinking.

Malamitsa, et, al. (2008) indicates that one of the critical thinking skills is the skill of analysis, which means understanding meanings and revealing relationships between concepts and phrases, evaluation skill and indicates the extent of confidence between the given information and data, and the skill of deduction, which means reaching rationally acceptable conclusions and guesses, and skill Deductive reasoning means that the supposed validity of the introduction requires the validity of the conclusion, and the skill of inductive reasoning.

In sum, it is necessary to find enrichment strategies for the curriculum that contribute to the development of academic achievement and various thinking skills such as critical thinking, while the student's acquisition of critical thinking skills is one of the most important things that must be developed in the education process. The student has critical thinking skills.

Previous Studies

The researcher divided the previous studies into two main axes as follows:

First: Studies relating to the accompanying enrichment activities: a summary of these studies will be presented as follows:

Hijazi's study (2020) aimed to verify the effectiveness of a program based on enrichment activities in sports patterns to develop mathematical proof skills for 30 students in the second year of middle school. The study applied the mathematical proof skills test, in addition to the training program. The results showed the growth of the mathematical proof skills of the study sample as a result of the enrichment activities.

Ahmed's study (2019) also aimed to use the enrichment activities accompanying the social studies curriculum to develop moral thinking skills among a sample of (45) students from Ali bin Abi Talib Primary School in New Damietta, where the enrichment activities included 12 activities distributed over three units of study for the set curriculum and the preparation of a moral reasoning scale. The results of the study indicated that there were statistically significant differences between the mean scores of the two applications, the pre and post applications, in favor of the post application in the moral reasoning scale.

Hassan's study (2019) aimed to use the enrichment activities accompanying the social studies curriculum; to develop moral thinking skills among primary school students. A moral reasoning scale applied with the enrichment activities program was applied to (45) students of the grade 6 Ali Ibn Abi Talib Elementary School in New Damietta. findings indicated that t statistically significant difference between thetwo group pre and post for the post application.

Saqri's study (2019) also aimed to develop a suggested program for the English language teachers to employ electronic enrichment activities in improving the listening and speaking skills of (60) middle school students in the Buraidah city. A questionnaire was prepared for this, in addition to the proposed program for the employment of teachers for electronic enrichment activities. The study found that there are differences in the arithmetic averages of the responses of the sample members with regard to the reality of the English language teachers' use of electronic enrichment activities in improving the listening and speaking skills at the middle stage.

Omar and Darraj study (2018) investigated the effect of using enrichment activities designed in teaching the life operations unit on the achievement of sixth grade students in Riyadh compared to the usual method. The study included a sample of (67) sixth grade students, who were divided into two groups, an experimental group and a control group. The researchers prepared the enrichment activities in addition to an achievement test applied to the two groups. Findings indicated statistically significant differences between the experimental group and the control group for the experimental group in the achievement.

Second: Studies relating to the critical thinking: A summary of these studies will be presented as follows:

The study of Ijbara et al. (2021) aimed to identify the effect of using a study program based on the stem learning curve in teaching mathematics on the critical thinking skills of a sample of (44) students from "advanced schools for smart learning" through the use of the quasi-experimental approach. The results showed that there were statistically significant differences between the mean scores of analysis skill, induction skill, inference skill, conclusion skill, and evaluation skill for the first group.

Al-Zaboun et al. (2020) study sought to identify the effect of employing active learning strategies in developing critical thinking skills in physics for a sample of (99) students of the upper basic stage at Manshiyat Bani Hussein Secondary School for Boys. The students were divided into four groups: a control group and three experimental groups where the first experimental group studied with the mental mapping strategy, the second one studied with the cooperative learning strategy, and the third one studied with the modeling learning strategy. The results showed a positive effect on developing critical thinking skills in favor of the experimental groups.

Hafez's study (2015) concerned with verifying the effectiveness of using the reciprocal teaching strategy in teaching literary texts to develop literary taste and critical thinking skills of (70) first year secondary school students, students were divided into two groups, control and experimental group. The results showed that there were statistically significant differences between mean scores of

the two groups in the critical thinking skills for the experimental group.

Al-Barqawi's study (2013) aimed to identify the effectiveness of critical and creative thinking skills on the literary appreciation of (90) fourth-grade literary students in preparatory and secondary day schools for boys in the ethnic center of Babil Governorate. The sample was divided into three groups: the first experimental group studied using critical thinking skills, the second studied the same course using creative thinking skills. The results indicated that there were statistically significant differences between the three groups in their scores on the literary appreciation scale, in favor of the first and second groups.

Al-Mulhim's study (2012) was concerned with discussing the impact of a program depending on dynamic evaluation in developing critical thinking and cognitive beliefs for middle school students in public education schools in Al-Ahsa Governorate. The sample consisted of (28) students, who were divided into two experimental and control groups. Findings indicated that a significant differences between the two groups for the experimental group.

Previous Studies Discussion

The studies of Hegazy (2020), Ahmed (2019), Hassan (2019), Saqri (2019), Omar and Darraj (2018), Al-Hadabi et al. (2012) agreed on the effectiveness of the accompanying enrichment activities strategy in raising academic achievement rates and improving achievement motivation and attitude towards academic courses, improving various thinking skills such as creative and critical thinking, and benefiting both teachers and students from applying the enrichment strategies.

The results that dealt with studies that focused on critical thinking indicated that critical thinking skills can be improved through different teaching strategies, and this was confirmed by the studies of Ijbarh et al. (2021), Al-Zaboun et al. (2020), Hafez (2015), Al-Barqawi (2013), Al-Hadabi. Al-Ashwal (2012), Al-Mulhim (2012).

Study sample: The current study sample included (45) students of both sexes at Abu Dhabi University, who are studying the Islamic culture course for the academic year 2020/2021 spring semester. This can be shown according to the following table:

Table (1) *Distribution of the study sample according to Gender*

Gender	Number	%
Males	14	31,1
Females	31	68,9
Total	45	100

The previous table indicates the distribution of the study sample according to gender, where males represented (31.1%) of the study sample, while females represented (68.9%), which is an indicator of an increase in the percentage of females over males.

Study Tools

The current study included two tools as follows: the critical thinking scale and the achievement motivation scale as follows:

First: Critical Thinking Scale: the current study relied on the Watson - Glaser Critical Thinking Appraisal to measure critical thinking skills, What concerns us in the current study is the total degree of critical thinking, which was translated by Jaber Abdel Hamid and Yahya Hindam (2002). Consequently, this Appraisal will be relied upon as the best appraisal in the Arab environment that measures critical thinking.

Validity and Reliability of the critical thinking Appraisal: The validity of the appraisal was calculated based on the opinions of a number of jury members, where the appraisal was presented to the jury members to ensure its validity for application in the current study. This coefficient is statistically significant at the level (0.05).

Second: The achievement test: An achievement test was prepared in the Islamic culture course the students study. This test included (15) questions so that through the achievement test, the standards of knowledge and understanding are measured.

The validity and reliability of the achievement test: The test was presented to a group of jury members with the aim of verifying its validity for application in the current study, then it was agreed on the questions agreed by the jury members, while the statements that were not agreed upon by the jury members were modified or deleted. Furthermore, reliability was calculated by Alpha Cronbach coefficient

for the dimensions of the test and its total score, as follows:

Table (2) *indicates correlation coefficient for re-application on the achievement motivation scale*

Dimension	Alpha Coefficient	Significance
Knowledge	0,81	0,05
Comprehension	0,79	
Remembering	0,88	
Total Score	0,72	

It is clear from the previous table that Cronbach's alpha coefficient was statistically significant at the level (0.05) for the dimensions of knowledge, comprehension and remembering in addition to the total score of the test.

Approach of the Study

The following study followed the quasi experimental approach that depends on one group design and the pre-post applications.

Results of the Study

This part of the study reviews its findings, as the study questions will be addressed separately:

First: answer of the first question: this question stated "Are there statistically significant differences between the mean scores of the two pre and post applications after applying the enrichment activities in the knowledge skill with regard to the achievement test?" Table (3) shows the results of this question as follows:

Table (3) *shows the Z value and its Statistical Significance for the Differences between the Mean Scores of the two Pre and Post Applications in the Knowledge Skill in relation to the Achievement Test*

Skill	Application	No.	Mean Scores	Total Scores	Zee value
Knowledge	**Pre**	45	8,00	120,00	-4.6
	Post	45	18,00	345,00	

Statistically significant at 0,05 level where Z value < 0.05

It is clear from the previous table that there are statistically significant differences between the pre and post applications in favor of the post application, after applying the enrichment activities, where the calculated Z value of knowledge skill was (-4.6) and this value is less than the table value which is (0.11). This means that there are statistically significant differences between The two applications after applying the enrichment activities in the knowledge skill in favor of the post application.

Second: The answer to the second question: this question stated "Are there statistically significant differences between the mean scores of the two pre and post applications after applying the enrichment activities in the comprehension skill with regard to the achievement test?" Table (4) shows the results of this question as follows:

Table (4) *shows the Z value and its Statistical Significance for the Differences between the Mean Scores of the two Pre and Post Applications in the Comprehension Skill in relation to the Achievement Test*

Skill	Application	No.	Mean Scores	Total Scores	Zee value
Knowledge	**Pre**	45	6,5	112,0	-4.3
	Post	45	18,5	350,0	

Statistically significant at 0,05 level where Z value < 0.05

It is clear from the previous table that there are statistically significant differences between the pre and post applications in favor of the post application, after applying the enrichment activities, where the calculated Z value of comprehension skill was (-4.3) and this value is less than the table value which is (0.11). This means that there are statistically significant differences between The two applications after applying the enrichment activities in the comprehension skill in favor of the post application.

Third: The answer to the second question: this question stated "Are there statistically significant differences between the mean scores of the two pre and post applications after applying the enrichment activities in the remembering skill with regard to the achievement test?" Table (5) shows the results of this question as follows:

Table (5) *shows the Z value and its Statistical Significance for the Differences between the Mean Scores of the two Pre and Post Applications in the Remembering Skill in relation to the Achievement Test*

Skill	Application	No.	Mean Scores	Total Scores	Zee value
Knowledge	**Pre**	45	8,50	110,0	-3.5
	Post	45	16,50	345,0	

Statistically significant at 0,05 level where Z value < 0.05

It is clear from the previous table that there are statistically significant differences between the pre and post applications in favor of the post application, after applying the enrichment activities, where the calculated Z value of remembering skill was (-3.5) and this value is less than the table value which is (0.11). This means that there are statistically significant differences between The two applications after applying the enrichment activities in the remembering skill in favor of the post application.

Third: The answer to the second question: this question stated "Are there statistically significant differences between the mean scores of the two pre and post applications after applying the enrichment activities in the remembering skill with regard to the achievement test?" Table (5) shows the results of this question as follows:

Table (5) *shows the Z value and its Statistical Significance for the Differences between the Mean Scores of the two Pre and Post Applications in the Remembering Skill in relation to the Achievement Test*

Skill	Application	No.	Mean Scores	Total Scores	Zee value
Knowledge	**Pre**	45	8,50	110,0	-3.5
	Post	45	16,50	345,0	

Statistically significant at 0,05 level where Z value < 0.05

It is clear from the previous table that there are statistically significant differences between the pre and post applications in favor of the post application, after applying the enrichment activities, where the calculated Z value of remembering skill was (-3.5) and this value is less than the table value which is (0.11). This means that there are statistically significant differences between The two applications after applying the enrichment activities in the remembering skill in favor of the post application.

Third: The answer to the second question: this question stated "Are there statistically significant differences between the mean scores of the two pre and post applications after applying the enrichment activities in the remembering skill with regard to the achievement test?" Table (5) shows the results of this question as follows:

Table (5) *shows the Z value and its Statistical Significance for the Differences between the Mean Scores of the two Pre and Post Applications in the Remembering Skill in relation to the Achievement Test*

Skill	Application	No.	Mean Scores	Total Scores	Zee value
Knowledge	**Pre**	45	8,50	110,0	-3.5
	Post	45	16,50	345,0	

Statistically significant at 0,05 level where Z value < 0.05

It is clear from the previous table that there are statistically significant differences between the pre and post applications in favor of the post application, after applying the enrichment activities, where the calculated Z value of remembering skill was (-3.5) and this value is less than the table value which is (0.11). This means that there are statistically significant differences between The two applications after applying the enrichment activities in the remembering skill in favor of the post application.

Fourth: The answer to the second question: this question stated "Are there statistically significant differences between the mean scores of the two pre and post applications after applying the enrichment activities in the critical thinking appraisal?" Table (6) shows the results of this question as follows:

Table (6) *shows the Z value and its Statistical Significance for the Differences between the Mean Scores of the two Pre and Post Applications in the Critical Thinking Appraisal*

Skill	Application	No.	Mean Scores	Total Scores	Zee value
Knowledge	**Pre**	45	10,50	112,0	-3.2
	Post	45	18,50	360,0	

Statistically significant at 0,05 level where Z value < 0.05

It is clear from the previous table that there are statistically significant differences between the pre and post applications in favor of the post application, after applying the enrichment activities, where the calculated Z value of the critical thinking appraisal was (-3.2) and this value is less than the table value which is (0.11). This means that there are statistically significant differences between The two applications after applying the enrichment activities with regard to the critical thinking in favor of the post application.

Discussion

The study questions included four questions, three of which were concerned with the skills included in the achievement test as follows: knowledge, comprehension and remembering.

The results of the three skills indicated that there were statistically significant differences between the pre and post applications in favor of the post application, as indicated by the studies of Hijazi (2020), Ahmed (2019), Hassan (2019), Saqri (2019), Omar and Darraj (2018). Al-Hadabi et al. (2012), where the results of those studies agreed on the effectiveness of the accompanying enrichment activities strategy in raising academic achievement rates and improving various learning skills such as knowledge, comprehension, remembering, analysis, application, achievement motivation, and attitude towards academic courses, in addition to improving various thinking skills, such as creative and critical thinking, and benefiting both teachers and students from applying enrichment strategies, and this is what was shown by the results of the current study on the achievement test.

Moreover, the results of the current study also found the effectiveness of enrichment activities in improving critical thinking skills, as indicated by the results of the studies of Ijbarh et al. (2021), Al- Zaboun et al. (2020), Hafez (2015), Al-Barqawi (2013), Al-Hadabi and Al-Ashwal (2012), Al-Mulhim (2012), where the results of those studies indicated that critical thinking skills are among the most important skills to be developed during the educational process for all students. Results of the current study showed the effectiveness of enrichment activities and their positive and clear impact on the critical thinking skills of learners.

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