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The Impact of Applying Project-Based Learning Techniques on Developing Critical and Analytical Thinking Skills in History

Faleeha Oleiwi Nayyef
Independent Research, Uzbekistan

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ABSTRACT

Objective: *This study aimed to determine the impact of applying project learning techniques in developing critical and analytical thinking skills in the subject of history for middle school students.* ***Method:*** *The study relied on experimental curriculum, and the SPSS statistical analysis program was used to analyze data to test the health of the hypotheses.* ***Results:*** *The research found that there is a moral impact on the application of project learning techniques in developing critical and analytical thinking skills in history for middle -grade students in the post application.* ***Novelty:*** *Based on the results, the researcher presented a number of recommendations, the most prominent of which are: the need to discuss the teacher to students with the details of the project plan and its goals and clarify some of the difficulties that can face them, and to help them choose the project's work tools in order to achieve the desired benefit from the educational project, and to provide an educational environment that allows learners to discuss Their ideas and analyzes, presenting their conclusions, and giving them the freedom to criticize ideas and information in light of specific educational standards.*

INTRODUCTION

Thinking skills are essential and necessary skills for every individual living in contemporary societies. These skills are vital for individuals to adapt to their communities and achieve their aspirations. Consequently, the school is considered one of the environments where individuals should be trained in various thinking skills such as critical and analytical thinking, through different means such as the school textbook, implementing educational projects, and utilizing multimedia technologies [1], [2].

Therefore, developing thinking and learning its skills through the curriculum becomes an accessible and feasible process when there is an active, qualified, and well-trained teacher capable of developing critical and analytical thinking skills among students. Teaching and training students in critical and analytical thinking skills is considered an easy process rather than a difficult one, as students naturally tend to think when they encounter an event or situation that requires insight and reflection [3], [4].

Critical and analytical thinking skills are among the important topics that correspond with the changes of the modern era, which is characterized by rapid transformations and a massive explosion of knowledge. Their importance increases as students acquire these skills and learn how to employ them in dealing with different types of knowledge through analysis, interpretation, inference, and evaluation. Project-Based Learning (PBL) strategies and their techniques represent one of the instructional strategies that provide a learning environment with diverse objectives. These strategies rely on applications that enhance learning and develop learners' critical and analytical

skills throughout their lives through various educational situations. In addition, they promote self-learning, as project-based learning is a collaborative form of learning that encourages participation and cooperative work among learners. Working in groups contributes to the development of professional teamwork skills among learners and enhances effective communication skills required in professional work environments after graduation [5], [6].

Furthermore, this approach enhances students' understanding of the subject of history, which holds an important position among the branches of social studies. It aims to develop students' intellectual abilities, stimulate their thinking, and train them in understanding, analysis, inference, synthesis, and collecting information and facts from different sources. It also enables them to make decisions and issue sound judgments regarding the issues they study [7], [8].

The study of history is not limited to recording the past or reading scattered facts, information, and events. Rather, it is a science that seeks to study the conditions of nations and peoples in order to understand the changes and developments that have occurred over time. Moreover, the study of history represents a fertile field for developing students' critical and analytical thinking skills and helping them face the growing problems of our contemporary world [9], [10].

Research Problem and Questions

History is among the leading subjects through which topics related to prevention from the risks of disasters, both natural and social, can be addressed because it provides learners with a comprehensive understanding of geography and climate on the one hand, and history, events, their developments, and the evolution of civilizations on the other hand. However, students still suffer from difficulties in understanding and comprehending this subject appropriately. This difficulty is mainly due to the weakness of their critical and analytical skills, which enable them to understand, interpret, and analyze historical topics. Therefore, it is necessary to adopt strategies that enable learners to receive historical information in a manner based on critical and analytical understanding, allowing them to first understand the historical event, then analyze it for deeper comprehension, and critique it when necessary.

Accordingly, the study raises the following main research questions:

1. What is the effect of implementing project-based learning techniques on developing critical and analytical thinking skills in the subject of history?
2. Are there any statistically significant differences between the mean responses of the research sample in the two groups regarding the effect of implementing project-based learning techniques on developing critical and analytical thinking skills among first-grade intermediate students in the subject of history?

Objectives of the Study

1. To determine the effect of implementing project-based learning techniques on developing critical and analytical thinking skills in the subject of history.

2. To identify statistically significant differences between the mean responses of the research sample in the two research groups regarding the effect of implementing project-based learning techniques on developing critical and analytical thinking skills.

Significance of the Study

1. The importance of this study emerges from the urgent need to study the science of history in order to understand the lessons of the past, comprehend the present, and anticipate the future. Additionally, it contributes to analyzing historical events and understanding global developments and changes, while keeping pace with them through openness to the civilizations of pioneering and diverse nations and peoples.
2. Clarifying the importance of developing critical and analytical thinking in the subject of history, as it helps learners break down events and reconnect and reconstruct them in ways that align with the events themselves on the one hand and with the learner's own understanding on the other.
3. Highlighting the necessity of relying on modern teaching strategies in general, and in teaching history in particular, since it is a subject that requires cooperative work among learners in order to avoid boredom and reach information more easily.
4. Providing a scientific contribution to the educational field, as the variables presented have not previously been studied together. Therefore, the study may serve as a reference for researchers and those interested in developing thinking skills.

Reasons for Choosing the Study

1. Its relevance to the researcher's academic specialization.
2. The researcher's personal desire to review recent studies, gain further knowledge about the study variables, and conduct a practical applied study on students in the preparatory and secondary stages in Iraqi schools.

Study Limits and Delimitations

1. Subject Limits: Investigating the effect of implementing project-based learning techniques on developing critical and analytical thinking skills in the subject of history.
2. Spatial Limits: The study will be conducted in Iraqi schools.
3. Human Limits: A sample of first-grade intermediate students in Iraqi schools.
4. Temporal Limits: During the academic year 2024.

Study Hypotheses

1. There is a difference between the mean scores of first-grade intermediate students in the experimental and control groups on the critical and analytical thinking skills test in the post-test application.
2. There is a difference between the mean scores of first-grade intermediate students in the experimental group on the critical and analytical thinking skills test between the pre-test and post-test applications.

RESEARCH METHOD

The experimental method was adopted because it is appropriate for the objectives, hypotheses, and ideas proposed in the study. The variables will be described by referring to previous studies and research. Teaching plans for the subject of history were designed according to project-based learning techniques, along with a test of critical and analytical thinking skills, to be applied to a sample of first-grade intermediate students selected through purposive sampling. The research then analyzed the obtained data and tested the proposed hypotheses based on several statistical analyses using the Statistical Package for the Social Sciences (SPSS), version 25.

Study Terminology

Project-Based Learning: Is one of the systematic instructional approaches in which learners participate in acquiring knowledge and enhancing essential life skills through an extended inquiry process carried out by learners regarding diverse and complex issues [11].

Operational Definition: The teaching procedures used in presenting the lesson on the historical eras experienced by Muslims according to project-based learning techniques for first-grade intermediate students.

Critical Thinking: It is a mental activity performed by the learner to reach logical judgments through specific standards and rules with the aim of correcting errors and demonstrating sensitivity to the situation and context in which it occurs, in order to reach a solution to a specific problem or to examine and evaluate the solutions presented to the learner during the classroom situation [12].

Operational Definition: The score obtained by first-grade intermediate students in the subject of history according to the test designed to measure their critical thinking skills.

Analytical Thinking: It is the ability possessed by the learner to confront problems that arise and work to break them down into parts in a careful and systematic manner, paying attention to the details that compose them and searching for the surrounding details in order to reach the most appropriate intellectual conclusions [13].

Operational Definition: The score obtained by first-grade intermediate students in the subject of history according to the test designed to measure their analytical thinking skills.

Theoretical Framework and Previous Studies

First: Theoretical Framework

Project-Based Learning: Project-based learning is considered a methodological alternative to traditional learning. It involves direct engagement with the subject of study and culminates in students implementing a project proposed by the teacher. Learners analyze the proposed topic, reflect upon it, organize themselves, search for information, work as a team, and make decisions. This approach aims to enhance knowledge of the learning content as well as develop skills and attitudes, and to teach learners how to employ these resources in solving the problems presented [14].

Projects can also be defined as complex tasks based on challenging questions or problems that engage students in design, problem-solving, decision-making, or investigative activities. They provide students with opportunities to work relatively independently over extended periods of time, culminating in realistic products or presentations [15].

Project inquiries may also be based on societal issues or concerns related to economic, political, social, media, or educational matters, or even on stimulating curiosity about a particular topic. Projects generally culminate in realistic products or presentations [16]. Project-based learning focuses on labor market needs, as it addresses both the professional and social domains. This contributes to improving learners' employment opportunities after graduation, helps meet the demand for skilled labor, supports continuous training capacities, and assists in the development of vocational education [17].

Critical Thinking: Critical thinking is a complex form of thinking composed of a series of mental processes carried out according to known standards through examining knowledge, facts, and the relationships between them with the aim of making a judgment. It can also be described as the learner's ability to express an opinion of agreement or disagreement based on convincing logical reasons. With regard to the concept of critical thinking, it represents the process of organizing, describing, analyzing, and evaluating information in order to reach a particular conclusion. It is followed by creative thinking, in which new ideas, diverse alternatives, and innovative solutions to problems are generated. Critical thinking includes logical reasoning that supports the development of evaluative skills in research, particularly for students studying history [18].

Critical thinking is widely recognized as an educational objective. Although its definition remains debatable, differing viewpoints can be regarded as varying interpretations of the same fundamental concept. Critical thinking has been described as the ability to analyze information objectively and make a reasoned judgment. It involves evaluating sources such as data, facts, observable phenomena, and research findings. It is also defined as the objective analysis and evaluation of an issue in order to form a judgment, and as the mental process of conceptualizing, applying, analyzing, synthesizing, and evaluating information [19].

Masoud and Hindi indicate that critical thinking includes a series of mental processes such as identifying, analyzing, and evaluating data. Critical thinking means being skilled in performing these activities accompanied by a form of logical skepticism. Myers believes that critical thinking represents the power of organizing faculties (the ability to create an analytical framework), accepting new possibilities (avoiding prejudice), and suspending judgment (safe skepticism and avoiding premature conclusions). It is therefore a rational and deep form of thinking that allows us to determine what we believe and what actions should be taken.

Among the characteristics of individuals who possess this skill is that they have an open mind toward new ideas, can distinguish between facts and opinions using

reliable scientific sources, and issue judgments carefully after evidence has been provided and examined. They do not rely on emotional thinking but rather view problems clearly from multiple perspectives while respecting the differences in others' ideas and opinions. They also possess emotional tendencies and values such as curiosity, understanding others, and self-confidence [20].

Critical Thinking Skills

Analysis Skill: In the field of analytical thinking, this skill is defined as the learner's ability to break down the subject matter into its primary and secondary components.

Deduction Skill: This skill refers to the learner's ability to deduce a conclusion by distinguishing between the probability of correctness or error, and to recognize the validity of a conclusion in light of certain facts.

Induction Skill: This skill refers to reaching generalizations from which facts are derived in order to confirm the experiences acquired by the learner, and consequently arrive at the judgment issued by the individual.

Reasoning Skill: This is the mental skill or ability through which previous experiences, situations, and experiments are used in order to reach a solution or a specific conclusion.

Evaluation Skill: This skill refers to the individual's ability to make judgments about the quality of the proposed idea by identifying what is primary or secondary within the source, particularly the available sources. The evaluation skill includes two sub-skills: claims and evaluation of arguments [21].

Analytical Thinking

Analytical thinking is the ability of an individual to pay attention to details when solving problems they encounter and to deal with them in a systematic and logical manner. Individuals with analytical thinking rely on searching for the best method, formula, procedure, or system that enables them to reach a solution compared to other thinking styles. Individuals with this thinking style prefer induction, prediction, and rationality based on data, objectivity, and procedural aspects. When solving problems, they focus on planning, attempting to find the best possible method, verifying facts, and trying to predict what may happen in the future [21].

Training students in analytical thinking skills is therefore essential. Developing a specific set of skills helps individuals solve many of the problems they encounter in their daily lives. When analyzing successful analytical thinking, it can be understood as a sequential mental process in which the mind is stimulated to break down a situation or condition in order to organize it, reorganize it, and arrange it so that it becomes structured, prepared, and suitable for the functioning of the brain and its processes.

This process also involves encoding, recording, and integrating information into the learner's experiences in order to help them solve or manage the issues they seek to address. Clarifying this thinking approach makes the learner more aware, insightful, understanding, and profound in achieving their cognitive goals. This highlights the importance and quality of these advanced mental processes represented in cognitive processing, problem-solving, and organization. Accordingly, studying successful

analytical thinking is essential in making the thinking process purposeful and effective [12].

Patterns of Analytical Thinking

Thinking Strategy: This includes vision, premises, values, and assumptions.

Thinking Strength: This requires the individual to remain positive and continuously develop their thinking, which gives them confidence in achieving their goals.

Creative Thinking: This refers to the individual's awareness of opportunities for creative solutions rather than merely acquiring information, and involves using higher mental processes such as originality and judgment.

Analytical Thinking: This pattern of thinking helps individuals reach the correct choice. A person who thinks analytically should maintain these considerations in their thinking. Analytical thinkers should select appropriate solutions and plan carefully when designing their strategies by comparing alternatives and examining the sequence of available solutions. Teachers should encourage them to perform various tasks that refine the information they have learned and will continue to learn [13].

Second: Related Previous Studies

Study by Muslama entitled: Teaching Writing Skills through the Linguistic Landscape Based on Project-Based Learning for Secondary School Students: A Multi-case Study in Muhammadiyah Schools [14].

The study aimed to investigate teaching writing skills through the linguistic landscape based on Project-Based Learning (PjBL), which aligns with the characteristics of creative and innovative thinking skills, critical thinking skills, communication skills, and collaboration skills among secondary school students in Muhammadiyah schools.

The researcher adopted the descriptive analytical method and found that the process of teaching writing skills through the linguistic landscape based on project-based learning for secondary school students differs in implementing the stages of introduction, identification, and renewal. The results also showed that there are five forms of linguistic landscapes based on project-based learning which are syntactic linguistic landscape, map linguistic landscape, vocabulary linguistic landscape, calligraphy linguistic landscape, and biographical linguistic landscape

The supporting and hindering factors are divided into internal and external factors. Overcoming these obstacles requires integrated efforts such as increasing educational investment to improve resource readiness, and adopting appropriate teaching models by teachers.

Study by Al-Raddadi entitled: Designing a Proposed Program Based on Electronic Project-Based Learning in Social Studies and Measuring Its Effectiveness in Developing Disaster Prevention Literacy among Third Intermediate Grade Female Students [20].

The study aimed to design a proposed program based on electronic project-based learning and measure its effectiveness in developing the dimensions of disaster prevention literacy (cognitive, skill-based, and affective). The research followed a quasi-experimental method using a two-group design (experimental and control) with pre- and

post-testing. The study sample consisted of 64 third intermediate grade female students in public schools in the Madinah region, equally divided into two groups. The results showed a positive effect of the program on developing the different dimensions of disaster prevention literacy.

Study by Abd, Mohammed & Yusuf entitled: The Effect of the Venn Diagram Strategy on Developing Analytical Thinking among Female Students of the Institute of Fine Arts in the Subject of Contemporary Art History [18].

The study aimed to identify the effect of the Venn diagram strategy on developing analytical thinking among students of the Institute of Fine Arts in the subject of contemporary art history for fifth-stage students in the Department of Fine Arts (Academic year 2021–2022).

The research design included experimental and control groups with pre- and post-tests. The study concluded that the Venn diagram strategy was effective in raising students' achievement levels in the subject of contemporary art history.

Foreign Studies

Study by Pantiwati entitled: The Effects of the Blended Project-Based Literacy that Integrates School Literacy Movement Strengthening Character Education Learning Model on Metacognitive Skills, Critical Thinking, and Opinion Expression [6].

The study aimed to investigate the effects of a blended project-based learning model integrating the School Literacy Movement and character education (Li-Pro-GP) on students' metacognitive skills, critical thinking, and opinion expression. An experimental design was used. The study was conducted at Government Junior High School 23 Malang, with a sample of 30 students from grades 7–12. Data were analyzed using SmartPLS. The results showed that the Li-Pro-GP blended learning model significantly enhanced students' metacognitive skills, critical thinking, and opinion formation.

Study by Chen et al entitled: Effect of Project-Based Learning on Development of Students' Creative Thinking [9].

The study aimed to investigate the effect of integrating creative thinking instruction through project-based learning in an engineering course. A quasi-experimental design was implemented. The lecture-based strategy was applied to the control group, while the experimental group was taught using the project-based learning strategy. The results showed that the project-based learning approach enhanced students' creative thinking, particularly in fluency and flexibility. Students reported in interviews that appropriate creative thinking tools significantly enhanced their creativity. Therefore, providing diverse creative thinking tools is necessary to support the development of creative thinking habits.

Study by Sari & Prasetyo entitled: Project-Based Learning in a Critical Reading Course to Enhance Critical Thinking Skills [5].

The study aimed to investigate the implementation of project-based learning (PjBL) in critical reading courses to enhance critical thinking skills and to describe students' responses toward its implementation. The research adopted a mixed-method approach, and the sample included 26 EFL students at STKIP PGRI Sidoarjo, Indonesia.

The results indicated that EFL students lack critical thinking in reading, especially in Indonesia. The study also found that 88.89% of students were enthusiastic about working on tasks using the PjBL model, and 54% achieved excellent performance.

Commentary on Previous Studies

Based on the presentation of the group of Arab and foreign studies discussed above, it can be observed that they agree with the present research in at least one of the variables addressed in the current study. Therefore, it can be said that they are similar to the current research in their topic, or in part of it. However, all the variables of the present study have not been observed together in any previous study. This indicates that the present study is characterized by originality in terms of combining these variables, which also reflects the lack of such studies in Iraqi academic libraries.

This study is considered an extension of previous studies and represents a recent Arab study in comparison with earlier studies.

RESULTS AND DISCUSSION

Chapter Three: The Practical Study

Research Population: The research population was defined as all first-grade intermediate students in Al-Anbar, with a total number of 1,364 male and female students.

Research Sample: A sample representing the research population was selected and divided into two groups: experimental and control, each consisting of 29 male and female students.

The researcher conducted equivalence between the two research groups according to the following procedures:

1. Equivalence According to Previous Year Scores in History

The following table presents the results of the t-test, showing the arithmetic mean, standard deviation, sample size, degrees of freedom, calculated value, and tabulated value. The calculated t-test value was lower than the tabulated value, indicating that there are no statistically significant differences between the two groups at the probability level of 0.05.

This reflects the similarity between the two research groups in their history subject scores during the previous academic year.

Table 1. Equivalence of the Two Research Groups in Students' Scores in the History Subject in the Previous Year

Group	Sample	Mean	ST	df	t-test		p-value
Experimental	29	49.87	7.65	56	Calculated	Scheduled	Not significant
Control	29	51.32	7.42	56	0.780	2.00	Not significant

2. Equivalence According to the Level of Critical and Analytical Thinking Skills

The following table shows the results of the t-test, displaying the arithmetic mean, standard deviation, sample size, degrees of freedom, and the calculated and tabulated values. The alternative hypothesis was rejected because the calculated t-test value was lower than the tabulated value, indicating that there are no statistically significant differences between the two groups according to the agreed probability level (0.05). This demonstrates the similarity between the two research groups in their level of critical and analytical thinking skills.

Table 2. Equivalence of the Two Research Groups in Students' Scores on the Critical and Analytical Thinking Skills Test

Group	Sample	Mean	ST	df	t-test		p-value
Experimental	29	22.36	4.82	56	Calculated	Scheduled	Not significant
Control	29	20.54	4.49	56	0.24	2.00	Not significant

Internal and External Validity of the Experiment

Internal validity in the experimental design refers to controlling variables that may affect the study results accurately and effectively in order to ensure precise and reliable outcomes. External validity, on the other hand, relates to dealing with variables in a safe and responsible manner to ensure the credibility and reliability of the research results. Several procedures were followed to ensure both internal and external validity in the study, such as: selecting a random sample, controlling intervening variables, and standardizing the use of research tools. All these procedures aim to protect the study data and participants from any potential harm.

Research Requirements

Regarding the requirements of the research, they included the following:

Test Measuring Critical and Analytical Thinking Skills among First-Grade Intermediate Students in the Subject of History

The researcher sought to design a test that measures students' ability to evaluate information and connect it in order to reach new knowledge. The test consists of 30 items, divided into two sections: 15 items measuring critical thinking skills + 15 items measuring analytical thinking skills The test type was multiple-choice, where each item includes one correct answer.

The test characteristics were measured as follows:

Reliability: The reliability of the test was confirmed according to the opinions of reviewers and specialists, who showed an agreement exceeding 80% on several items. They also suggested modifying some items to ensure the enhancement of critical thinking skills among second intermediate grade students.

Difficulty, Ease, and Discrimination Indices of Test Items: The obtained values demonstrated that the test items were suitable for achieving the purpose of the study.

Table 3. Difficulty, Ease, and Discrimination Indices for the Critical and Analytical Thinking Test

Discrimination	Ease	Difficulty	S	Discrimination	Ease	Difficulty	S	Discrimination	Ease	Difficulty	S
0.63	0.63	0.37	3.	0.50	0.63	0.37	2.	0.5	0.69	0.31	1.
0.50	0.56	0.44	6.	0.50	0.63	0.37	5.	0.50	0.63	0.37	4.
0.63	0.63	0.37	3.	0.50	0.63	0.37	2.	0.56	0.59	0.41	1.
0.50	0.56	0.44	6.	0.50	0.75	0.25	5.	0.50	0.63	0.37	4.
0.50	0.56	0.44	9.	0.63	0.56	0.44	8.	0.50	0.69	0.31	7.
0.63	0.63	0.37	12.	0.50	0.63	0.37	11.	0.56	0.59	0.41	10.
0.50	0.56	0.44	15.	0.50	0.75	0.25	14.	0.50	0.63	0.37	13.
0.63	0.63	0.37	18.	0.50	0.63	0.37	17.	0.5	0.69	0.31	16.
0.50	0.56	0.44	21.	0.50	0.63	0.37	20.	0.50	0.63	0.37	19.
0.63	0.63	0.37	24.	0.50	0.63	0.37	23.	0.56	0.59	0.41	22.
0.50	0.56	0.44	27.	0.50	0.75	0.25	26.	0.50	0.63	0.37	25.
0.50	0.56	0.44	30.	0.63	0.56	0.44	29.	0.50	0.69	0.31	28.

Educational Program Based on Project-Based Learning Techniques

A teaching plan was prepared for the lesson "Historical Eras Experienced by Muslims", aiming to achieve the following behavioral objectives:

1. Enhancing students' analysis and critical thinking skills through studying historical eras and providing in-depth interpretations of historical events.
2. Enhancing students' research and analytical abilities by using project-based learning techniques so that they learn how to search for, collect, and analyze information systematically.
3. Strengthening teamwork and collaboration skills among students through participation in educational projects that require coordination and cooperation among group members.
4. Enhancing students' cultural and historical awareness and improving their understanding of previous cultures and traditions that influenced Islamic societies.

5. Developing students' communication and expression skills through presenting a final project that requires explaining and presenting their ideas and findings to classmates and teachers.
6. Strengthening students' self-development abilities by setting goals and organizing their time to accomplish an educational project based on their skills and personal interests.

To achieve the previous behavioral objectives, several activities were used to support the implementation of project-based learning techniques in teaching the lesson on the historical eras of Muslims:

1. Research Project: Students are asked to select a historical topic of importance to Muslims and conduct research on it, such as the Crusades, the Abbasid Caliphate, or Islamic civilization in Andalusia.
2. Group Presentation Project: Students prepare a presentation on a specific period in Islamic history and explain the major events and prominent figures during that period.
3. Historical Book Project: Students write a short historical book about a specific historical era of Muslims explaining the events and developments that occurred during that period.
4. Creative Presentation Project: Students produce a creative presentation illustrating different aspects of Islamic culture and history, such as using visual arts or traditional dance.
5. Applied Project: Students may be asked to prepare a simulation of an important historical event, such as reenacting a specific battle or portraying a famous historical figure such as Sultan Saladin.

Experimental Procedures

1. Determining the research objective, which aims to develop students' critical and analytical thinking skills in the subject of history.
2. Preparing a teaching plan whose content and tools achieve the intended objective.
3. Conducting a pre-test before the experiment to determine students' prior knowledge and their ability in critical and analytical thinking.
4. In cooperation with the students, the experiment is implemented, where data are collected, analyzed, and the results are evaluated.
5. After completing the research procedures, a post-test is conducted to evaluate the development of students' critical and analytical thinking skills.
6. Evaluating the results based on performance in the test and estimating the improvement in students' critical and analytical thinking skills.

Statistical Methods

The researcher conducted advanced statistical tests to analyze the differences between the two groups, such as the t-test to verify whether there were significant differences in the means between the two groups. In addition, the test of the difference between means was used to determine whether there were precise differences between the two groups.

Testing the Research Hypotheses

First Hypothesis: There is a difference between the average scores of first intermediate grade students in the experimental and control groups on the critical and analytical thinking skills test in the post-application. The differences between the scores obtained by students of the two research groups on the critical and analytical thinking skills test after conducting the experiment were evaluated. Statistical procedures were applied to calculate the mean scores and their dispersion, and based on this, a t-test was calculated to determine whether differences existed or not. The following table shows the obtained results.

Table 4. Difference Between the Means of the Two Research Groups in the Post-Application of the Critical and Analytical Thinking Skills Test

Group	Number	Mean	ST	df	t-test	p-value
Experimental	29	29.53	5.62	56	5.72	0.000
Control	29	22.06	4.37	56	5.72	0.000

The difference between the means of the two research groups in the post-application of the critical and analytical thinking skills test indicates a large difference in performance between the experimental group and the control group. The mean score of the experimental group was 29.53, whereas the mean score of the control group was 22.06. The calculated t-test value was 5.72, which indicates the presence of a statistically significant difference between the two groups. The p-value was 0.000, which is lower than the accepted significance level (0.05). This indicates that there is a statistically significant difference between the two groups in the development of critical thinking skills after the post-test application. The results also indicate that after applying the test to evaluate critical and analytical thinking skills, there was a significant improvement in the performance of the experimental group compared with the control group. The large difference in the means between the two groups and the p-value lower than the accepted level of significance indicate that this difference is not merely random variation but rather a statistically significant difference. These results can be relied upon to guide efforts aimed at improving and developing critical and analytical thinking skills in the experimental group. From the researcher's perspective, there may be several reasons for the differences between the mean performance of the experimental group and the control group in this study. Among the possible factors that may have influenced this difference are that the experimental group may have had a better baseline level of critical thinking skills compared with the control group, which may have contributed to achieving better results after training. In addition, the experimental group may have received more support and resources than the control group, which led to better performance on the test.

Second Hypothesis: There is a difference between the average scores of first intermediate grade students in the experimental group on the critical and analytical thinking skills test in the pre- and post-applications. The differences between the scores obtained by students of the experimental group on the critical and analytical thinking skills test when applied before and after the experiment were evaluated. Statistical procedures were applied to determine the mean of these scores and their dispersion, and accordingly a t-test was calculated to confirm or reject the presence of differences. The following table shows the results obtained.

Table 5. Difference Between the Mean Scores of the Experimental Group in the Pre- and Post-Applications of the Critical and Analytical Thinking Skills Test

Application	Calculated Mean	Standard Deviation	t-test	df	p-value
Pre-test	20.33	4.633	5.24	56	0.000
Post-test	29.53	5.87			

These data appear to reflect noticeable differences between the mean scores of the experimental group in the pre- and post-applications of the critical thinking skills test. Based on the p-value, which measures the validity of the null hypothesis, if the p-value is less than the specified value (0.05), the statistical test indicates the presence of statistically significant differences. According to the data presented in the table, it can be concluded that there was a significant improvement in critical thinking skills after applying the educational program, as the group's mean increased substantially. The statistical value (p-value = 0.000) indicates the existence of statistically significant differences between the pre-test and post-test results.

From the researcher's point of view, the previous result may be attributed to several factors. Among them is that the educational program applied may have been effective in improving the participants' critical and analytical thinking skills. The program may also have introduced new skills or highlighted methods and tools that help develop these skills. Furthermore, the participants in the study may have shown greater interest and interaction with the training program, which contributed to improving their skill levels. In addition, the environment in which the training program was implemented may have been suitable for motivating students and enhancing their ability to think critically.

Based on the factors mentioned above, the previous result may be due to the positive impact of the educational program on improving the participants' critical and analytical thinking skills, in addition to other factors that may have influenced the improvement of participants' performance and their interaction with the training program.

CONCLUSION

Fundamental Finding: Encouraging teachers at different educational stages to employ project-based learning in teaching the subject of history. **Implication:** The teacher should discuss with students the details of the project plan and its objectives, clarify some of the difficulties they may face, and assist them in selecting the tools for implementing the project in order to achieve the intended benefits of the educational project. **Limitation:** Providing a learning environment that allows learners to discuss their ideas and analyses and present their conclusions. **Future Research:** Giving them the freedom to critically evaluate ideas and information according to specific educational standards.

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*** Faleeha Oleiwi Nayyef (Corresponding Author)**
Independent Research, Uzbekistan