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RESEARCH ARTICLE

The Impact of Using Virtual Tours in Teaching Social Studies on Developing Students' Visual Historical Identity and Aesthetic Appreciation

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ABSTRACT

This study investigates the effectiveness of virtual tours in teaching social studies, focusing on their impact on the development of historical visual identity and aesthetic appreciation among students. To meet the study's objectives, a semi-experimental approach utilizing experimental and control groups was employed. Two study instruments were developed: the historical visual identity test and the aesthetic taste scale, both of which were validated for reliability and stability. The participants in the study consisted of 40 seventh-grade students from Sanar Secondary School for Boys and Translator Secondary School for Boys, located in the Directorate of Education in Ajloun Governorate, during the academic year 2024/2025. The findings indicated statistically significant differences at the 0.05 level between the arithmetic means of the control group and those of the experimental group regarding the aesthetic taste test, which can be attributed to the teaching method favoring virtual tours. The findings from the second question indicated statistically significant differences at the 0.05 level between the arithmetic means of the control group and those of the experimental group regarding the scale of aesthetic taste associated with the teaching method, favoring virtual tours. The researchers advocate for the integration of virtual tours into social studies curricula to improve historical comprehension and overall understanding. Additionally, they emphasize the importance of offering workshops and training for educators on the effective implementation of virtual tours in teaching.

INTRODUCTION

The utilization of virtual tours in social studies education is an innovative strategy designed to enrich the learning experience and encourage students to engage with historical and cultural material. It offers an interactive virtual environment that allows students to genuinely and fully study historical and cultural locations without the necessity of actual travel. Virtual reality technology facilitates engaging interactive experiences that allow students to investigate historical landmarks, cultural locations, and significant events in an intriguing and immersive manner.

Hanafi and Ibrahim (2022) assert the necessity of equipping learners for real-life challenges by developing innovative educational curricula that align with the contemporary electronic landscape. They advocate for the creation of positive virtual learning environments that allow students to perceive and analyze subjects as if they were tangible, thereby facilitating exploration within an interactive realm. This has resulted in the rise of virtual tours.

The categories of virtual tours encompassed photos, videos, audio, panoramas, 3D virtual tours, and synchronous virtual reality tours, ranging from basic to intricate, illustrating the significant advancements in this domain. Consequently, virtual tours serve as a mechanism that facilitates the acquisition of diverse knowledge, experiences, and abilities, while also fostering the development of higher-order thinking and requisite technical competencies (Al-Jabbas, 2019).

Online virtual tours offer a simulated representation of the actual environment, serving as an effective medium for both educators and learners. These excursions provide students educational opportunities that may be challenging to acquire through conventional tours. Virtual tours can be conducted to locations that are challenging to access, either due to distance, such as the South Pole and other planets, or due to hazards, such as monitoring volcanic activity. These tours also enhance learners' self-discovery and self-directed learning abilities (Hassan, 2011).

Virtual tours represent a revolution in the educational process, as they provide an effective alternative to traditional field visits, making it easier for learners of different ages to explore information in new and interesting ways. They also enhance the ability of learners to self-learn and interact with the educational content presented, which contributes to achieving better and more enjoyable educational results. It is also considered an innovative educational tool that meets the needs of learners in the shadow of information technology, as it provides diverse educational experiences that help enhance understanding and interaction with content (Muhammad, 2022).

The use of virtual tours contributes effectively to the transfer of historical concepts and human interaction with them through time and space, and it can be used to record and monitor various historical facts and achievements, and transfer them to current and future generations, and its use contributes to preserving cultural and human heritage and enhancing loyalty and belonging to the homeland (Badir, 2021).

Virtual tours are employed in the development of the historical visual identity through the employment of various educational tools and means such as drawings, maps, images and shapes, which are visual tools that gain the learner a large amount of historical information and knowledge in a brief manner, through which deduction and problem-solving processes and relationships can be carried out through linking images (Nazzal, 2016).

Through virtual tours, students can learn about art, architecture and historical design, which is an essential part of visual identity, enabling them to explore famous works of art and historical buildings and express their opinions and emotions about them. In this way, their visual abilities are developed and their aesthetic taste is developed (Abani, 2015).

Visual identity is an important aspect in the processes of teaching and learning social studies through the teaching of historical topics, as it works to develop many thinking skills, including visual thinking skills such as formulating questions and conducting historical investigations inside and outside the classroom through consensual tours, where the student is not only listening but also watching historical sites and looking for sound explanations that reach sound results by employing his senses in the educational situation (Al-Mutairi, 2020).

Virtual tours also play an important role in the development of aesthetic taste among students by taking tours in historical places by default easily, quickly and at the lowest costs and highlighting the aesthetic aspects of it, as he controls the way he understands the image by reflecting its content electronically, and reconciles his feeling and knowledge on the one hand, and his desire to enjoy, on the other hand, and this results in that the student dyes the artwork with his spirit and experience, which is similar to the feelings and ideas of the photographer, which increases emotional empathy and symbolic empathy (Abani, 2015).

Aesthetic taste in education is nothing but the integration of beauty into the educational process, which makes it a fun process. The student who attends school is full of feelings and feelings, and when the teacher presents the new learning mixed with aesthetic experiences, it makes the learning process a beautiful and enjoyable experience capable of developing his mental images, and its impact is not limited to that, but the aesthetic experiences have a great impact in connecting the different branches of knowledge in a deep way (Younis, 2020).

Aesthetic taste is one of the requirements of the times. The student needs emotional satisfaction and a sense of beauty around him. Attention must be paid to aesthetic education that will improve the student's taste and develop a sense of beauty towards historical sites. Hence, the role of the aesthetic approach in making education more enjoyable and effective by including the element of beauty through virtual tours (Al-Maliji & Al-Jundi, 2021).

The aesthetic approach through virtual trips is based on the development of aesthetic trends of historical and archaeological sites among students from wide areas beyond the dry interpretation of these sites to enjoy studying them, which leads to the opening of the minds of learners, and helps them to reach to see the hidden beauties of these sites (Sayed, 2013).

Syukur (2022) aimed to develop the virtual tour of the museum using the 3D Vista operating system as a source for learning history. This study was conducted in Turkey, where the semi-experimental approach was used. To achieve the goal of the study, the study tool of pre-test and post-test was used for one group, and it was tested on 30 students from the tenth grade in secondary school (2021/2022). The results of this study were as follows: The learning tools developed were tested to verify their validity after verifying them with 4 experts, and the educational resources for virtual tours in the museum were tested in terms of practical application with an application rate of 87.87%, and the effectiveness of the device consisting of student activities in the learning process obtained an N-Gin score of 5.57 with an average score. The conclusion of this study is that the learning tools that have been developed have been tested to be valid, practical and effective.

Hassan and Obeidat (2022) also sought to reveal the effectiveness of employing interactive video in the teaching of social and national education in the development of visual thinking and communication skills among students. The study used semi-experimental design, and the study tools of the visual thinking test and the communication skills scale were built. Their validity and stability were verified, and they were applied to the study members consisting of (48) students from the fifth grade of Mada International Academy of Wadi Al-Sir in the Jordanian capital, Amman. They were distributed into two groups, an experimental group consisting of (25) students, and a control group consisting of (23) students during the second semester of the academic year 2021/2022. The results of the study found that there were statistically significant differences at the level of (0.05) between the averages of the experimental and control groups in the visual thinking test, and they were in favor of the experimental group who were exposed to the interactive video teaching method.

Ali (2023) aimed to demonstrate the efficacy of virtual tours of ancient sites in Al-Ahsa in fostering historical notions among kindergarten students and to ascertain the disparities between men and girls in the acquisition of these concepts. A quasi-experimental methodology with a singular set design was employed. To fulfill the study's purpose, the study instrument was employed in an achievement assessment.

The study sample comprised 30 children, both boys and girls, aged 5 to 6 years, enrolled in the third level of kindergartens affiliated with the third primary school for early life in Hofuf, Al-Ahsa Governorate, during the academic year 2022/2023. The results indicated statistically significant differences at the 0.05 level between the average scores of the experimental group in the pre- and post-assessments of the graphical test of historical ideas, favoring the post-assessment. The

virtual tours of archeological sites influence the formation of historical notions in kindergarten children. The results indicated no statistically significant differences at the 0.05 level between the average scores of males and girls on the historical ideas test following the post-application.

Al-Musharrafi et al. (2023) sought to elucidate the function of cognitive excursions and their application in using virtual tours within the museum practices of student teachers at the Faculty of Early Childhood Education at Matrouh University. A semi-experimental one-group design was employed. To accomplish the study's objective, the research instrument utilized consisted of the observation card and the accomplishment test. The sample comprised 50 female students from the Faculty of Early Childhood Education at Matrouh University during the academic year 2022/2023. The study's results indicated the efficacy of cognitive excursions in utilizing virtual tours within the museum activities of student teachers at the Faculty of Early Childhood Education.

Crossings and Obeids (2023) looked for evaluate the effectiveness of a virtual historical museum in enhancing students' enjoyment of learning within the context of history education. A semi-experimental approach was employed to meet the study's objectives. The learning pleasure scale was developed, and its validity and reliability were established. This tool was utilized on a sample of 54 students, comprising 22 in the experimental group and 32 in the control group. The experimental group received instruction through the virtual historical museum, while the control group was taught using traditional methods in a Yarmouk model school during the academic year 2022/2023. The study's results indicated statistically significant differences at the 0.05 level in the learning pleasure scale between the experimental and control groups, favoring the experimental group that utilized the virtual historical museum.

Abdel Moneim's study (2024) aimed to assess the effectiveness of virtual tours utilizing Google digital applications in enhancing tourism awareness and self-learning skills among kindergarten children. The research was conducted in Sharqia Governorate, Egypt. An experimental approach was employed, and the research tools included the e-tourism awareness scale and the e-tourism self-learning skills scale, both designed for kindergarten children. The research sample included 60 children, comprising boys and girls aged 5 to 6 years. The experimental group consisted of 30 children, while the control group also included 30 children for the academic year 2024/2025. The findings indicated that the program utilizing virtual tours through Google digital applications positively influenced the development of tourism awareness and self-learning skills in kindergarten children.

Saleh (2024) aimed to investigate the impact of virtual tours on female students in the Faculty of Physical Education, specifically by examining their attitudes towards virtual recreation. The research was carried out in Tanta, Egypt. A one-group experimental approach was employed. The study utilized a recreation scale designed for university students. The primary research sample comprised 364 female students, supplemented by an exploratory sample of 50 female students external to the main research sample. The study was conducted during the academic year 2024/2025. The findings indicate that the proposed recreational program effectively enhances the attitudes of female students in the Faculty of Physical Education towards virtual recreation.

The current study is similar to some previous studies in dealing with the subject of virtual tours, whether as an independent or dependent variable. The current study is distinguished from the previous studies in the following:

- Employing virtual tours while teaching social studies and measuring their impact on the historical visual identity test and the aesthetic taste scale.
- Building a test of historical visual identity.

- Build a scale of aesthetic taste.

Statement of the Problem

Virtual tours serve as significant educational resources that engage various student senses, thereby enhancing the comprehension of educational content. By accessing information from diverse sources, these tours increase student motivation to learn. The study's problem arose from a researcher's experience as a social studies teacher, who inquired among colleagues about the use of technology in teaching. It was discovered that the majority do not utilize any technological resources in social studies instruction. This study responds to the recommendations of several prior studies, including those by Katat (2022), Hanafi and Ibrahim (2022), and Abdel Moneim (2024), which advocated for the incorporation of diverse virtual tours in educational settings. This study reveals the impact of using consensual tours in social studies education on the development of historical visual identity and aesthetic taste in students.

Questions of the Study

1- Is there a statistically significant difference at the significance level (α=0.05) between the arithmetic means of the control group and the experimental group regarding the historical visual identity test associated with the teaching method (traditional, virtual tours)?

2- Is there a statistically significant difference at the significance level (α=0.05) between the arithmetic means of the control group and the experimental group on the aesthetic taste scale associated with the teaching method (traditional, virtual tours)?

Significance of the Study

The significance of the study is that:

- **Teachers**: It develops teaching methods using technological innovations in education, including virtual tours.

- Curriculum Planners: Assists history curriculum planners in planning topics for history in the core stage using virtual tours.

- Researchers: This study contributes to opening new horizons for researchers to conduct further studies to develop historical visual identity at the upper basic stage or at other educational stages.

Limitations of the Study

Spatial limits: This study was applied in Sanar Secondary School for Boys and Al-Marjam Secondary School for Boys of the Directorate of Education in Ajloun Governorate, Jordan.

Time limits: This study was applied during the first semester of the academic year2024-2025.

Human Limits: A group of 7th graders.

Thematic Boundaries: Module Four (Civilizations of the Levant) of the book of social studies for the seventh grade, chapter one.

Procedural Terms

Virtual Tours: This technique employs virtual reality to construct realistic environments, simulating significant archaeological and historical sites, enabling students to discern the key attributes of these monuments, along with their location and significance, devoid of temporal or spatial limitations, utilizing various media forms such as text, images, video, audio, and 3D representations.

Visual Historical Identity: It refers to the process of cultivating the capacity to recognize and analyze historical visual elements, including art, architecture, and design, within a specific temporal context, focusing on aspects such as form, scale, function, architectural style, color, and details. This is assessed by the extent to which seventh-grade students achieve proficiency on a foundational visual identity test designed for this purpose.

Aesthetic Taste: It refers to the technical criteria of historical sites and the capacity to recognize and articulate beauty within the framework of social studies education. Aesthetic taste encompasses students' capacity to assess artworks, architectural designs, and historical artifacts, as well as to articulate their ideas and emotions regarding them. The measurement is based on the scores achieved by seventh-grade pupils on the designated aesthetic taste scale.

METHODOLOGY

The study relied on the experimental semi-experimental approach, as it is the most appropriate to reveal the impact of employing virtual tours during the teaching of social studies in the development of visual historical identity and aesthetic taste among students of the seventh grade.

Study Population

The participants in the study were seventh-grade students from Sanar Comprehensive Secondary School for Boys and Al-Marjam Comprehensive Secondary School for Boys, both associated with the Directorate of Education of Ajloun Governorate. The schools were selected deliberately. The decision was based on the researcher’s role as a teacher at Sanar Secondary School. The collaboration of the school administration at Al-Marjam Secondary School and the social studies teacher's readiness to assist during the implementation of the study processes are noteworthy. Two divisions of seventh-grade students were randomly chosen, with one designated as an experimental group including 20 students from Sanar Secondary School, and the other as a control group consisting of 20 students from Al-Marjam Secondary School.

The Study Material

The instructional material comprised a teacher's handbook, developed through the subsequent steps:

- Consult the educational literature and prior research about the deployment of virtual tours, and delineate the roles of both the educator and the learner in this process, including the studies by Bayoumi (2021), Hanafi and Ibrahim (2022), and Abdul Razzaq (2021).
- Citation of educational literature and prior research about visual historical identity and aesthetic preferences, including the works of LaMi (2018), Abdullah (2022), and Abdul Moncef (2023).

- Consult a collection of teacher manuals in Jordan to understand their design and content.
- The fourth unit of the seventh-grade social studies textbook, titled "Civilizations of the Levant," was examined, and the specific outcomes of each lesson were delineated, followed by the

formulation of detailed steps for implementing each lesson in accordance with the virtual tour strategy.

- The Teacher's Guide has been completed in its preliminary version, encompassing the following:

- A theoretical analysis of the virtual tour strategy and its significance in education.
- Providing overarching guidelines to the educator that are noted throughout the unit in accordance with the virtual tours approach.

- The overarching objectives of the educational unit include comprehending the concepts and terminology presented, establishing connections between cause and effect, recognizing similarities and differences, distinguishing between the main idea and supporting details, sequencing information, interpreting timelines, identifying problems and solutions, and drawing conclusions.

- The specific outcomes of each lesson were formulated: the capacity to differentiate the ancient civilizations of the Levant by recognizing their civilizational manifestations and accomplishments, as well as valuing the contributions of the ancient kingdoms in Jordan, while understanding the factors leading to the decline of the ancient civilizations of the Levant.

- Pedagogical approaches aligned with the concept of virtual excursions: The variety of pedagogical tools and tactics appropriate for instructing social studies, including collaborative learning, interactive learning, multimedia technologies, and specialized virtual tours for each course, has been delineated as follows:

No.	Lesson Title	Virtual tours
1	Lesson 1: The Ancient Civilizations of the Levant (Genesis)	Text, images, video, and digital maps.
2	Lesson 2: The Ancient Civilizations of the Levant (Civilizational Aspects and Achievements)	Text, images, video, digital maps, panoramic images.
3	Lesson 3: Civilizations of the Ancient Kingdoms of Jordan	Text, images, video, digital maps, panoramic images, virtual tours.
4	Lesson 4: The Ancient Civilizations of the Levant (Stage of Collapse)	Text, images, video, digital maps, panoramic images, virtual tours.

- Necessary activities and materials, time and method of implementation: The unit was divided into 8 classes for each lesson, two classes, and from the educational means, tools and activities used: digital maps, the Internet, models, models, and various electronic media.

Evaluation strategy: structural evaluation, final evaluation, performance-based evaluation.

Student Role

- Discuss the learner with both his colleagues and his teacher about the concepts to be discussed.

- Comparing what the learner is doing in terms of positives, observations and activities.

- The learner excludes wrong answers and helps and discusses with fellow learners.

- The learner should be active, positive and effective. He/she talks, discusses and asks questions.

Teacher Role

- Creating a classroom environment based on dialogue, interaction and discussion among all students.

- Stimulating students' thinking and motivation towards learning.

- Provide students with feedback.

-Build collaboration groups for discussion, interpretation, dialogue, making predictions, presenting different solutions, and deciding on them.

- Accepting the opinions of all students and not criticizing them and allowing them to express them.

Study Tools

To achieve the objectives of the study, which is to reveal the impact of employing virtual tours in the light of teaching social studies in the development of historical visual identity and aesthetic taste, the following tools were used:

1. Historical Visual Identity Test

The following procedures were executed in the preparation of the test:
1. The researcher constructed the study test utilizing theoretical literature and pertinent prior investigations, including the Abdul Moncef study (2023) and the Abdullah study (2022).

2. The unit of the Levantine civilizations was referenced, examined, and interrogatives were constructed based on it in accordance with the principles of historical visual identity creation.

3. The specification table for the historical visual identity exam was developed, since the test initially had twenty multiple-choice questions.

4. The test's validity was assessed by a panel of specialized arbitrators, comprising university professors in social studies, teaching methodologies, and history, all of whom possess doctoral qualifications, alongside several educational supervisors from the Ministry of Education. They were solicited for their opinions regarding the test's content coverage and its appropriateness for each skill, the degree to which the test fulfilled the study's objectives, the clarity of the test questions, and the relevance of the alternatives to the questions. Subsequently, the arbitrators' feedback was collected and implemented, with some suggesting amendments and rephrasing for enhanced clarity.

5. To ascertain the stability of the test, the test-retest method was employed, involving an exploratory sample of 20 seventh-grade students external to the study sample. The test was administered to this exploratory sample after a two-week interval, and the Pearson correlation coefficient was computed between the scores of the exploratory sample students at both time points, yielding a value of 0.90, which is deemed high and suitable for the objectives of this study (Odeh, 2014).

The equivalence of the two study groups to test the historical visual identity

The equivalence of the two study groups (experimental and control) in preperformance was tested, using a t-test for independent samples, and Table (1) shows this.

Table (1) Results of the t-test to reveal the equivalence of the two study groups in preperformance Historical Visual Identity Test

Dependent variable	SPG	Arithmetic Mean	Standard Deviation	Calculates the T test.	Degree of freedom	sig
Historical Visual Identity Test	Experimental group	9000	2.67346	1.120	38	270
	Control group	0500	2.08945			

It is noted from Table (1) that there is no statistically significant difference between the average performance of the two study groups in the historical visual identity test; this indicates that the two groups are statistically equal before the treatment is carried out.

2. Aesthetic Taste Scale

To achieve the study's aims, the researcher devised the aesthetic taste scale, adhering to the subsequent steps in its preparation:

1. focusing upon the theoretical literature and prior research concerning aesthetic taste, including Younis (2020) and the Zurk study (2018), the aesthetic taste scale was developed in its preliminary form, ensuring that the items were coherent and valid, comprising a total of 20 items.

2. The apparent validity was assessed by submitting the aesthetic taste scale in its original form to a panel of ten arbitrators to determine its apparent validity. They were requested to evaluate the scale based on the linguistic integrity of the paragraphs and their appropriateness for the current research sample. The arbitrators' perspectives were adjusted according to their deemed appropriateness. The researcher obtained approval for the suggested revisions from 80% of the arbitrators. The final version of the scale had twenty paragraphs.

3. To ascertain the construction validity indicators for all items of the aesthetic taste scale, the scale was administered to a survey sample of 20 students. The construction validity indicators were computed using the Pearson correlation coefficient between each item and the overall scale, as presented in Table 2.

Table (2) Evaluate the correlation coefficients between each aesthetic taste vertebrae and the instrument as a whole

Paragraph	Tool Correlation Coefficient	Paragraph	Tool Correlation Coefficient
1	.81	11	.37
2	56	12	53
3	21.	13	58
4	50	14	56
5	.43	15	.60

6	.38	16	53
7	.41	17	.23
8	39	18	.41
9	.40	19	24
10	53	20	.52

Table No. (2) shows correlation coefficients ranging between (0.21) and (0.81), where the value of the correlation coefficient (00.2) was adopted as a criterion for the acceptance of paragraphs as indicated by Odeh (2010), and therefore none of the paragraphs of the aesthetic taste scale was deleted, as the scale is in its final form of (20) paragraphs.

According to the stability of the aesthetic taste scale by applying the stability equation of the scale in the method of internal consistency (Cronbach Alpha) and the stability of the return (Re-Test) of the exploratory sample of (20) students, and the stability coefficient of the return was (0.86), and the internal consistency coefficient is equal to (0.80).

Aesthetic Taste Scale Correction

The triple Likert gradient was adopted to correct the study instrument (significantly, moderately, moderately), and the corrected paragraphs were given as follows: significantly (3), moderately (2), moderately (1).

The Equivalence of the Two Study Groups Aesthetic Taste

The equivalence of the two study groups (experimental and control) in preperformance was tested, using a t-test for independent samples, and Table (3) shows this.

Table (3) Results of the t-test to reveal the equivalence of the two study groups in the preperformance of aesthetic taste

Dependent Variable	SPG	Arithmetic Mean	deviation Normative	Calculates the T test	Degree of Freedom	Statistical Significance
Aesthetic Taste	Empiricism	1.	0.51689	1.385	38	174
	Control group	9500	0.34527			

It is noted from Table (3) that there is no statistically significant difference between the average performances of the two study groups for aesthetic taste; this indicates that the two groups are statistically equal before the treatment is carried out.

Procedure of the Study

To achieve the objectives of the study, the following procedures were to achieve the study's aims, the subsequent procedures were executed:

- Determine the study's problem, its inquiries, and its variables.
- Examining the theoretical literature and prior research pertinent to the study's topic.
- Developing the visual historical identity assessment and the aesthetic taste scale in their

preliminary versions, and validating the content by presenting the research instruments to a panel of qualified evaluators.

• Developing the study material, which included a teacher's handbook and verifying its authenticity.
• Implement a balanced timetable across groups to ensure students engage in equal study durations daily, which will be incorporated into the teacher's handbook.
• Coordinate with the administration of Sanar and Al-Murjem schools to execute the study.
• Collaborate with the laboratory supervisor to ensure the provision of suitable equipment in the laboratory, including computers, presentation devices, Internet access, and seating arrangements.

• Commencing the implementation of the study in the first semester of the 2024-2025 academic year.

• Using the instruments (historical visual identity test, aesthetic preference scale) on an exploratory sample to assess the validity and reliability of the tools, as well as the suitability of the timeframe suggested by the evaluators.

• Take advantage of the instruments in advance (historical visual identity assessment, aesthetic preference scale) on both groups (experimental and control) to confirm their equivalence.
• Teaching the experimental group through virtual tours, while the control group receives traditional instruction, over a span of three weeks with three weekly sessions, each lasting 45 minutes.

• Applying remote tools (historical visual identity assessment, aesthetic taste scale) on both groups (experimental and control).

• Grading the historical visual identity test papers following the presentation of the educational material for both groups, deconstructing the data from the aesthetic taste scale, and subsequently analyzing the data utilizing the appropriate statistical methods in accordance with the Statistical Package for the Social Sciences (SPSS) to address the study questions and derive interpretations of the results.

• Formulating recommendations based on the attained results, which may enhance a novel area of inquiry.

Research Variables

The study included the following variables:

Independent variable: teaching strategy and has two categories (virtual tours, regular method)

Dependent variables: dimensional visual historical identity, dimensional aesthetic taste.

Results and Discussion

Q1: The results related to the first question: " Is there a statistically significant difference at the level of significance (α=0.05) between the arithmetic averages of the control group and the arithmetic averages of the experimental group on the historical visual identity test attributed to the teaching method (traditional, virtual tours)?

To answer the first question, the arithmetic means and standard deviations of the scores of the two study groups were calculated on the test of visual historical identity in the pre and post

measurements according to the teaching strategy, (traditional, virtual tours), and Table (4) shows this.

Table (4) Arithmetic means and standard deviations of the scores of the students of the control and experimental study groups in the pre and post measurements according to the variable of the teaching strategy

SPG	Pre-Test		Post-Test	
	Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation
Experimental group (virtual tours)	9000	2.67346	16.8000	2.50473
Control group (conventional method)	0500	2.08945	7000.	2.49420

Total score

Table (4) illustrates significant differences between the arithmetic means of the scores for the two study groups in the post-measurement of the visual historical identity test, based on the teaching strategy variable (traditional vs. virtual tours). The results indicate that the post-arithmetic mean for the experimental group is 16.8000, with a standard deviation of 2.50473, which exceeds the post-arithmetic mean for the control group, recorded at 13.7000, with a standard deviation of 2.49420.

To determine the statistical significance of the observed variations at the significance level (α=0.05), a one-way analysis of covariance (ANCOVA) was conducted on the post-metering data from the historical visual identity test. This analysis accounted for the pre-test score as a covariate to eliminate any pre-existing differences that could influence the study's outcomes, thereby isolating the effect of the independent variable (strategy). The results of this analysis are presented in Table 5.

Table (5) Results of the accompanying One-way ANCOVA analysis, for the scores of the students of the two study groups, experimental and control, in the post visual historical identity test, according to the variable of the teaching strategy

$^2\eta$	Significance level	F value	Mean Square (MS)	Degrees of Freedom (DF)	Sum of Squares (SS)	Source of variance
145	017	296	522	1	522	Pre-test
267	001	471	.865	1	.865	Teaching Strategy
			5.483	37	878	Error
				39	333.	Nephrology

Table (5) indicates a statistically significant difference at the significance level (α=0.05) between the arithmetic means of the scores of the two study groups in the post-measurement of the historical visual identity test, based on the teaching strategy variable. The value of (F) was (13.471), with a statistical significance of (0.001), indicating a significant effect of the teaching strategy. The value of Aita's box (η^2=0.267) indicates that the teaching strategy accounts for 26.7% of the explained variation in the dependent variable, specifically in the post visual historical identity test. This suggests a high impact size, as noted by Al-Kailani and Al-Sharifain (2016), where an impact size is considered high if it exceeds 16%.

To ascertain the attribution of the difference, the adjusted arithmetic means and standard errors from the post-measurement based on the teaching strategy were extracted, as presented in Table (6).

Table (6) Adjusted arithmetic means, and standard errors of the scores of the students of the study sample on the Historical Visual Identity Test according to a variable of the teaching strategy

Teaching Strategy	Arithmetic Mean	Rate Standard Error
Pilot Group (Virtual Tours)	631	.528
Control group (standard method)	13.869	.528

Total Score

The results presented in Table (6) demonstrate a significant difference favoring the experimental group, which utilized the virtual rounds strategy, with an adjusted arithmetic mean of 16.631, in contrast to the control group employing the conventional method, which had an adjusted arithmetic mean of 13.869.

The researchers attribute this result to the implementation of virtual tours for learners, which effectively meets the intended educational objectives. Virtual tours enhance the historical visual identity of learners by offering an interactive environment that enables active exploration of content. This form of learning improves participation and deepens understanding of diverse historical subjects. Virtual tours offer visually engaging educational content, facilitating information absorption and enhancing the enjoyment of the learning experience. Virtual tours enable students to observe, engage with, and contemplate historical sites, thereby reinforcing their mental representation of these locations.

The empirical group's findings indicate that virtual tours serve as an effective teaching medium for enhancing students' comprehension of historical content. This approach aids in the development of their visual historical identity and simplifies complex historical concepts by presenting them in accessible visual contexts. This finding aligns with the conclusions of Nazzal (2016) and Al-Mutairi (2020), which suggest that virtual tours enhance visual identity and visual intelligence.

Q2: Results pertaining to the second question, which inquired: "Is there a statistically significant difference at the significance level (α=0.05) between the arithmetic means of the control group and the arithmetic means of the experimental group regarding the scale of aesthetic taste associated with the teaching methods (traditional, virtual tours)?

The arithmetic means and standard deviations of the scores from the two study groups were calculated on the scale of aesthetic taste for both pre and post measurements, based on the teaching strategies employed (virtual tours versus the conventional method). This information is presented in Table 7.

Table (7) Arithmetic means, and standard deviations before and after students' scores on the aesthetic taste scale for the control and experimental study groups according to the teaching strategy variable

Teaching Strategy	Pre-test		post-test	
	*Arithmetic mean	Standard Deviation	*Arithmetic mean	Standard Deviation
Experimental Group (Virtual Tours)	1.	0.51689	2.	39379
Control Group (Traditional Method)	9500	0.34527	2275	0.55618

Table (7) illustrates significant differences in the arithmetic means of the scores between the two study groups in the post-measurement of the aesthetic taste scale, based on the teaching strategy (virtual tours versus the usual method). The results indicate that the experimental group has an arithmetic mean of 2.7325, with a standard deviation of 0.39379, which is higher than the control group's arithmetic mean of 2.2275, with a standard deviation of 0.55618.

To determine the statistical significance of these phenotypic variations at the significance level (α=0.05), covariate analysis was employed to assess aesthetic taste while controlling for a priori aesthetic taste as a covariate. This approach mitigated any confounding effects on the study's outcomes, isolating the independent variable (strategy). The statistical control afforded by one-way ANCOVA was utilized, and the results are presented in Table 8.

Table 8: Regular Budget by Category of Expenditure Results of the accompanying One-way ANCOVA analysis, for the scores of the students of the study groups, experimental and control on the scale of aesthetic taste, according to the variable of the teaching strategy

Source of variance	Sum of Squares (SS)	Degrees of Freedom (DF)	Mean Square (MS)	F value	Significance level	$^2\eta$
Pre-test	1.450	1	1.450	276	010	164
Teaching Strategy	3 320	1	3 320	659	.000	310
Error	374	37	199			
Nephrology	11.374	39				

It is clear from Table (8):

- A statistically significant difference exists at the significance level (α=0.05) between the arithmetic means of the scores of the two study groups in the post-measurement on the aesthetic taste scale, attributed to the teaching strategy. The value of (F) was (16.659), with a statistical significance of (0.000), indicating a significant effect of the teaching strategy. Consequently, the null hypothesis (the first) is rejected, and the alternative hypothesis is accepted, which posits a statistically significant difference at the significance level (α=0.05) between the arithmetic means of the control group and the experimental group on the aesthetic taste scale, based on the teaching method (traditional, virtual tours).

- The value of Aita's box (η^2=0.31) indicates that the teaching strategy accounts for 31% of the predicted variation in the dependent variable, aesthetic taste. This suggests a substantial impact, as noted by Al-Kaylani and Al-Sharifain (2016), who assert that an effect size is considered high when it exceeds 16%.

To determine in favor of whom the differences were attributed, the adjusted arithmetic means and their standard errors were extracted on the post-measurement according to the teaching strategy, as shown in Table (9).

Table 9 Adjusted arithmetic means, and standard errors of the scores of the students of the study sample on the scale of aesthetic taste according to the teaching strategy

Teaching Strategy	Average arithmetic mean Standard error	Standard error
Pilot Group (Virtual Tours)	2.775	101
Control group (standard method)	2.185	101

The results presented in Table (9) demonstrate a significant difference favoring the experimental group, which utilized the virtual rounds strategy, with an adjusted arithmetic mean of (2.775). In contrast, the control group, which employed the conventional method, had an adjusted arithmetic mean of (2.185).

The researchers attribute the superior performance of the experimental group on the aesthetic taste scale to the use of virtual tours as an educational tool. This approach enhances learners' appreciation of beauty and art, resulting in a rich and inspiring learning experience. It enables students to engage with content through diverse images and scenes, thereby deepening their understanding of art and culture. This approach encourages learners to engage with art and design independently, thereby enhancing their interaction with the aesthetics of historical sites. It promotes cognitive engagement and interaction with content, ultimately improving critical thinking skills and aesthetic appreciation among students. The result aligns with the references provided (Al-Sayed, 2013; Abani, 2015).

Recommendations

In light of the findings, the researchers recommend:

1- Virtual tours should be included as an essential part of social studies curricula to enhance historical and aesthetic understanding.

2- Provide workshops and training courses for teachers on how to use virtual tours effectively in education.

3- Support future research that explores the different dimensions of employing virtual tours and their impact on other educational fields.

4- Establish technical support platforms for teachers and students to ensure virtual tours are used effectively to enhance their skills in educational technologies.

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