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Enhancing Museum Tourism through Virtual and Augmented Reality Technologies: Evidence from the National Museum of the Mujahid (Algiers)

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Abstract

This study investigates the application of Virtual Reality (VR) and Augmented Reality (AR) technologies in enhancing museum tourism, focusing on the National Museum of the Mujahid (Algiers) as a case study. A structured questionnaire was distributed to museum employees, and statistical analysis revealed a significant positive impact of VR and AR implementation on visitor engagement, learning outcomes, and overall museum performance. The findings indicate that immersive technologies can create more interactive and memorable experiences for visitors, increasing both satisfaction and repeat visits. Moreover, the study highlights how integrating digital innovations can support museum staff in delivering educational content effectively. Based on these results, practical recommendations are provided for museum managers and policymakers aiming to implement VR and AR tools. The research advocates for broader adoption of immersive technologies across Algerian museums, aligning local practices with international standards and contributing to the development of a more digitally enriched cultural tourism sector.

Keywords: Virtual Reality, Augmented Reality, Museum Tourism, Visitor Engagement, Digital Innovation, National Museum of the Mujahid, Algeria

Introduction

The tourism sector is currently one of the most important sectors in any country's economy, given its role in promoting cultural exchange, showcasing civilizational heritage, and supporting livelihoods. Museums, with their diverse collections and exhibitions, constitute a key component of the tourism product. They play an essential role in attracting visitors, preserving artifacts, and presenting cultural narratives. Over time, museums have evolved in terms of the types of displays and presentation techniques, blending classical approaches with modern interactive methods to enhance visitor engagement.

Promoting museums as tourist destinations constitutes an important element of the tourism marketing mix. Promotion aims to raise awareness among tourists and to create positive interaction between visitors and the informational content provided. Traditional promotional tools include advertising, public relations, and personal selling, supplemented by exhibitions and festivals. With the revolution in information technology, promotional and activation tools in the tourism sector have developed significantly. In particular, Virtual Reality (VR) and Augmented Reality (AR) technologies have emerged as influential tools for museum presentation and visitor experience enhancement (Al-Umrji, 2017).

Despite the growing adoption of VR and AR globally, limited empirical research has examined their impact on museum tourism in Algeria. This study addresses this gap by investigating interactive display techniques at the National Museum of the Mujahid in Algiers, assessing how VR and AR applications influence visitor engagement and contribute to museum tourism activation

Statement of the Problem

Based on scientific studies in the field of digital communication and information and communication technologies, as well as the field study at the Mujahid Museum in Algiers, some interactive technologies have been introduced into museum display methods. Additionally, after reviewing some literature and articles related to museum tourism- which clarify the relationship between the use of modern interactive technologies in museums and their impact on attracting and engaging visitors, the following fundamental research question emerges: **What is the impact of applying Virtual Reality (VR) and Augmented Reality (AR) technologies in museum displays on promoting museum tourism in Algeria?**

Table1: Study Variables

<<Insert Table 1 here>>

Independent variable	Dependent variable
Virtual Reality (VR) and Augmented Reality (AR)	Museum tourism activation

Source: Prepared by the researcher

Research Hypothesis

Based on the research problem and the defined variables, the study hypothesizes that there is a statistically significant positive relationship between the implementation of VR and AR interactive technologies during museum exhibitions in Algeria (case of the National Museum of the Mujahid) and the activation of museum tourism.

Objectives of the Study

The study aims primarily:

1. To highlight the impact of modern interactive display technologies (VR and AR) on museum exhibitions and their effect on revitalizing museum tourism by providing visitors with unique and meaningful experiences.
2. To clarify the role of museums in preserving historical, artistic, and technical heritage, and their importance in stimulating tourist activity and promoting cultural awareness.
3. To demonstrate the importance of applying modern display technologies in Algerian museums and their effect on tourist movement and engagement.
4. To present a set of proposals pertaining to the research topic, including promotional techniques at the city or national level and their reflections on the tourism sector.

Methodology

The study follows a descriptive approach which focuses on examining the phenomenon as it exists in reality, and aims to describe and test the variables quantitatively using statistical methods. The research relies on a literature review of interactive technologies used in museum displays and conducts a field study at the National Museum of the Mujahid in Algiers during the period 2024-2025. Data collection involved distributing a questionnaire randomly to 40 staff members working at the museum. Personal interviews are also held with responsible personnel to obtain required information. Data are analyzed using SPSS, including reliability tests (Cronbach's alpha) and inferential statistics such as correlation and regression analyses.

Theoretical Framework:

I. Museums and Museum Display Techniques

A. Definition of the Museum:

The origin of the word museum goes back to Greek roots (mouseion), derived from Musa, meaning "Mount Helicon." The ancient Greeks built a temple on Mount Helicon near the Acropolis of Athens and called it Mouseion (Merriam-Webster, 2025). In Arabic, the term "متحف" (museum) is derived from the root "أتحفه به" meaning "to offer as a gift." The word تحفة (tuhfa) denotes something luxurious or precious. According to Al-Mu'jam Al-Waseet, a museum is defined as "a place for artistic or archaeological artifacts." Thus, the word museum signifies a place where valuable, artistic, or historical objects and cultural properties are gathered- items that inspire admiration and contemplation (Neghli, 2025).

The Canadian Museums Association (CMA) (2007) defines museums as institutions created for public benefit, aimed at acquiring, preserving, researching, interpreting, and displaying tangible and intangible evidence of society and nature. As educational institutions, they provide a forum for inquiry and critical examination. In 1974, the International Council of Museums (ICOM), at its 11th conference held in Copenhagen defined a museum as "a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates, and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study, and enjoyment" (International Council of Museums [ICOM], 1974).

B. Museum Display Techniques

Museum display is one of the core functions of a museum. It refers to how museum collections are presented and exhibited within or outside museum halls. In other words, it is the process of communicating museum artifacts such as

antiquities, paintings, statues, and other objects to visitors. The display process can be seen as a communication process between the sender (the museum) and the receiver (the visitor), using various means- verbal, audiovisual, electronic, and interactive media- to achieve a specific goal, while observing visitor feedback. The elements of communication can be applied to museum display as follows:

- ✓ Message: the content or goal intended to be conveyed through the museum display.
- ✓ Sender: the institution responsible for managing the museum and explaining its collections.
- ✓ Medium: the tools and methods used to present museum collections.
- ✓ Receiver: the museum visitor. (Ashqar, 2022)

Modern display technologies vary from country to country and from museum to museum, as innovations emerge continuously. Modern museums benefit from these technologies not only in display but also in storage, promotion, and restoration. Such technologies enhance visitor engagement and create unique interactive experiences. Accordingly, the following part attempts to present a comprehensive overview of these technologies, particularly Virtual Reality (VR) and Augmented Reality (AR), which have revolutionized visitor experiences in museums worldwide.

1. Virtual Reality (VR)

Virtual reality is a simulated environment that mirrors the real world, allowing individuals to experience and interact with it using specialized tools (Ibrahim, 2017). It enables immersion and interaction in a three-dimensional environment similar to the real world, giving users the sensation of full presence (Asmaa et al., 2017).

Virtual Reality contains a set of features that make it a powerful technology. Sherman & Craig (2018) illustrate that it provides users with alternative experiences comparable to real-world situations. It also allows representation and immersion in the real world, and enhances problem-solving abilities. Moreover, Virtual Reality removes spatial and temporal limitations, and enables fast access to and transfer of information.

The terms “immersive reality” and “virtual reality” are often used interchangeably, as the first refers to complete absorption in an artificial 3D world that stimulates light, sound, sensory perception, and emotions, creating an engaging experience for the users. This, also, is the essence of virtual reality.

Applications of Virtual Reality:

Virtual Reality can be useful in multiple fields. In education, it enables virtual visits and simulations of otherwise inaccessible locations, such as virtual museum tours and exhibition walkthroughs. In the field of training, VR provides realistic simulators for training purposes (e.g., flight simulators). In medicine, it is used for surgical training and 3D visualization before real operations. The visual media can use VR in advertising, TV production, and 3D film creation (Mazuryk & Gervautz, 1996). Furthermore, VR plays an important role in promoting tourism through its use of three-dimensional reality simulation, which allows tourists to visit and move between tourist sites while remaining in their own location. The state of virtual reality can be described by its ability to provide such immersion and engagement that the tourist becomes isolated from the real world (Jaafar, 2007). It offers an authentic experience that helps preserve touristic and heritage sites while enabling virtual visits to locations that are not suitable for overcrowding.

Virtual reality technology can be utilized to promote tourism by simulating and marketing tourist destinations, thereby helping to preserve real sites from deterioration while also providing a competitive advantage (Bazazo, 2014). Moreover, interaction with virtual reality is not predetermined but occurs simultaneously as the user engages with the computer. For instance, when a tourist takes a virtual tour of a specific site, they can choose their own path, knock on a door, cross a street, or perform other actions that mimic real-life experiences (Khamis, 2015).

Virtual Reality Tools:

Mazuryk & Gervautz (1996) stress that Virtual Reality uses excellent tools to bolster users' interaction in virtual environments. **3D Glasses**, for example, are worn to view specially produced 3D images or videos. Another tool is **Head-Mounted Display (HMD)**- a helmet-like device with built-in dual screens and audio, enabling full immersion. Additionally, interactive **tactile gloves** with motion sensors allow users to manipulate virtual objects in real time- for instance, rotating an artifact in a museum display.

2. Augmented Reality (AR)

Augmented Reality (AR) refers to the technology that overlays digital content (software and computer-generated objects) onto the real world in real time. It merges virtual objects and data with the user's real environment through wearable devices or mobile phones (Ding, 2017). In short, AR combines the virtual and the real, enriching the physical environment with additional layers of digital information.

Since the early 21st century, AR has been applied in museum exhibits- most notably through mobile applications. Its power lies in providing interpretive content and valuable observations by integrating virtual objects into the museum space. For example, AR was used in Algeria at the Roman archaeological site of Tipasa, where virtual reconstructions were projected onto artifacts to show visitors how they originally looked centuries ago. This enhanced visitor engagement and made artifacts appear to come “back to life.” With advancements in artificial intelligence, Augmented Reality has become one of the most attractive technologies for museum visitors.

Augmented Reality Tools:

To integrate virtual elements with the real world, Augmented Reality uses various tools. The simplest display method involves the use of computer screens and cameras to merge real and virtual imagery. Video See-Through Systems goes a step further to combine real-world footage with computer-generated visuals via head-mounted displays. Mobile Devices, mainly smartphones and tablets, overlay virtual images onto real-world scenes captured through device cameras using AR apps. Moreover, mixed reality projection combines physical and virtual 3D forms via projection mapping, blending both worlds in real space (Cortes et al., 2018). All these tools are designed to provide users with exceptional experiences that merge the virtual and the real together.

In summary, both Virtual Reality and Augmented Reality have revolutionized museum display methods. They enhance visitor experiences through immersion, interactivity, and education, transforming museums into dynamic, engaging spaces that bridge the real and the virtual. Despite these advances, empirical studies examining the impact of VR and AR on museum tourism in Algeria remain limited. This study addresses this gap by focusing on the National Museum of the Mughad in Algiers.

Applied Framework of the Study

The impact of applying Virtual Reality (VR) and Augmented Reality (AR) technologies in museum displays to promote tourism in Algerian museums is the main focus of this part of study. It begins with a presentation of the demographic characteristics of the research sample, followed by a detailed statistical analysis and interpretation of the data. Inferential statistical methods such as correlation and regression analysis are used to determine the relationships among the study variables. The analysis was conducted using the SPSS software package.

Validity and Reliability of the Questionnaire:

1. Validity of the Questionnaire:

The preliminary version of the questionnaire was reviewed by a number of experts and specialists from the National Higher School of Tourism and the Faculty of Information and Communication Sciences, to ensure the clarity and linguistic accuracy of the statements and to assess the questionnaire's relevance to the study's main problem: "The impact of applying Virtual Reality (VR) and Augmented Reality (AR) technologies in museum displays on enhancing museum tourism in Algeria."

Based on the evaluators' feedback and recommendations, several linguistic and structural adjustments were made to improve the instrument's quality.

2. Reliability of the Questionnaire:

Reliability refers to the consistency of the measurement tool - that is, obtaining the same results if the questionnaire is repeated with the same sample under identical conditions. The SPSS software was used to calculate Cronbach's Alpha coefficient, which measures internal consistency.

The value of this coefficient ranges between (0) and (1), and a value greater than 0.70 is generally considered acceptable. The following table presents the Cronbach's Alpha values for all variables.

Table (02): Cronbach's Alpha Coefficients for the Study Dimensions

<<Insert Table 2 here>>

Variable	Number of Items	Cronbach's Alpha
Virtual Reality and Interactive Technologies	05	0.791
Augmented Reality	04	0.759
Promotion of Museum Tourism	04	0.823
Barriers to Use	04	0.714

Source: Prepared by the researcher based on SPSS outputs.

Based on Table (02), the Cronbach's Alpha coefficients for the study variables range between 0.714 and 0.823, all exceeding 0.70, which indicates strong internal consistency among the questionnaire dimensions, confirming the reliability and validity of the data for further analysis and hypothesis testing.

Additionally, the questionnaire responses were rated using a five-point Likert scale, through which respondents expressed their degree of agreement or disagreement with each statement. The scale levels are distributed as follows:

Table 03: Likert Scale Degrees of Agreement

<<Insert Table 3 here>>

Level of Agreement	Rank
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Source: Prepared by the researcher based on Likert Scale.

Descriptive Statistics Test for the Questionnaire**Table 04: Mean Scores and Standard Deviations of Statements Related to Virtual Reality**

<<Insert Table 4 here>>

Statement	Mean	Standard Deviation	Percentage (%)	Degree of Agreement
The application of Virtual Reality technology in the National Museum of the Mujahid has contributed to its revitalization and the increase of visitors.	2.70	0.714	47.92	Moderate
The application of Virtual Reality technology contributes to improving the museum's image and reputation.	3.75	0.427	74.6	High
Modern touch screens help visitors obtain museum information more easily.	3.83	0.709	76.6	High
Interactive tables (touch-operated and multi-user) contribute to achieving social learning experiences.	4.07	0.518	81.4	High
Adjustable 3D sensors provide better interpretation possibilities for museum exhibits.	3.88	0.650	77.0	High

Source: Prepared by the researcher based on SPSS outputs.

The mean score of the statement “*The application of Virtual Reality technology in the National Museum of the Mujahid has contributed to its revitalization and the increase of visitors*” falls within the range [2.6 – 3.39], which corresponds to a “Moderate” level of agreement on the five-point Likert scale. This indicates that the respondents tend to show a neutral or moderate attitude regarding the implementation of Virtual Reality in the museum and its contribution to revitalizing its activity and increasing visitor numbers.

As for the mean scores of the remaining statements, they fall within the range [3.4 – 4.19], which corresponds to a “High” level of agreement on the five-point Likert scale. These scores are significantly higher than the neutral point (3), indicating a statistically meaningful difference. This reflects that most respondents agree with the content of these statements

and believe that modern touch screens, interactive tables, and adjustable 3D models provide visitors with an enjoyable and engaging museum experience. Moreover, respondents consider that Virtual Reality technologies are available and effectively implemented in the National Museum of the Mujahid.

Consequently, it can be concluded that the overall mean scores related to the dimension of *Virtual Reality and interactive technologies* indicate a “High” level of agreement according to the five-point Likert scale. Consequently, respondents generally agree with the content of this dimension and acknowledge the important role that Virtual Reality technologies play in enhancing the museum experience

Table 05: Mean Scores and Standard Deviations of Statements Related to *Augmented Reality*

<<Insert Table 5 here>>

Statement	Mean	Standard Deviation	Percentage (%)	Degree of Agreement
Augmented Reality technology plays a major role in reviving Algerian archaeological pieces and collections displayed in the National Museum of the Mujahid in Algiers and its annexes across different provinces.	4.23	0.678	81.6	High
Mobile phone applications facilitate the use of Augmented Reality in the museum.	3.83	0.696	78.5	High
Augmented Reality technology helps create greater sensory and visual interest in museum exhibits.	3.72	0.712	76.3	High
The implementation of Augmented Reality is feasible in the Museum of the Mujahid and considered cost-effective, especially with the advancement of Artificial Intelligence technologies.	4.42	0.654	82.9	High

Source: Prepared by the researcher based on SPSS outputs.

The mean scores related to the statements of the *Augmented Reality* dimension fall within the range [3.7 – 4.4], which corresponds to a “High” level of agreement according to the fields of the five-point Likert scale. These values are higher than the neutral point of the scale (3), indicating a significant positive tendency among respondents. The relative importance of these statements shows that the participants agree with their content and believe that Augmented Reality plays a major role in reviving Algerian archaeological pieces and collections displayed in the National Museum of the Mujahid in Algiers and its annexes across various provinces.

Respondents also believe that mobile applications facilitate the use of this technology, and that the implementation of Augmented Reality in the Museum of the Mujahid is feasible and cost-effective, especially with the advancement of Artificial Intelligence technologies.

Therefore, it can be concluded that the overall mean scores of respondents’ answers on the *Augmented Reality* dimension indicate a “High” level of agreement according to the five-point Likert scale. Consequently, the respondents agree with the general content of this dimension and acknowledge the important role that Augmented Reality technologies play in enhancing museum displays and promoting visitor engagement.

Table 06: Mean Scores and Standard Deviations of Statements Related to the Promotion of Museum Tourism

<<Insert Table 6 here>>

Statement	Mean	Standard Deviation	Percentage (%)	euJ
Tourists tend to visit museums that possess modern display technologies.	4.83	0.638	82.6	High
Virtual Reality and Augmented Reality technologies are important promotional tools that contribute to increasing the number of museum visitors.	3.63	0.706	76.5	High
The application of interactive technologies in the National Museum of the Mujahid contributes to the sustainability of its tourism activity.	3.42	0.772	70.9	High
The application of Virtual Reality and Augmented Reality technologies serves as a tourist attraction factor for the National Museum of the Mujahid.	4.43	0.651	82.9	High

Source: Prepared by the researcher based on SPSS outputs.

The mean scores related to the statements of the *Museum Tourism Promotion* dimension fall within the range [3.4 – 4.8], which corresponds to a “High” level of agreement according to the categories of the five-point Likert scale. These values

are higher than the neutral point (3), indicating that respondents show a positive tendency and high level of agreement toward this dimension. The relative importance of these statements reveals that the respondents agree with their content and believe that interactive display technologies create a positive touristic image of the museum, contributing to the sustainability of museum activities. Such technologies are perceived as effective promotional tools for attracting tourists.

Additionally, respondents agree that the use of Augmented Reality in museums increases visitor numbers, thereby contributing to the enhancement of museum tourism activity overall. They also believe that tourists are more likely to visit museums equipped with modern display technologies.

Hence, it can be inferred that the overall mean scores for this dimension indicate a “High” level of agreement according to the five-point Likert scale. Consequently, respondents agree with the general content of this dimension and acknowledge the significant role that Augmented Reality technologies play in stimulating and promoting museum displays.

Table 07: Mean Scores and Standard Deviations of Statements Related to Barriers to Use

<<Insert Table 7 here>>

Statement	Mean	Standard Deviation	Percentage (%)	Degree of Agreement
Difficulty in providing Virtual Reality devices due to their high cost.	4.13	0.738	80.6	High
Lack of qualified personnel to operate Virtual Reality and Augmented Reality devices.	4.96	0.806	86.5	High
Fear that technology may replace traditional museum and tourist site visits.	3.42	0.872	68.03	High
The implementation of these technologies requires coordinated governmental efforts involving several sectors, such as the Ministry of Communication and Digital Technologies, the Ministry of Culture, and the Ministry of Tourism.	4.43	0.651	82.9	High

Source: Prepared by the researcher based on SPSS outputs.

The mean scores related to the statements of the *Barriers to the Use of Interactive Technologies* dimension fall within the range [3.4 – 4.9], which corresponds to a “High” level of agreement according to the fields of the five-point Likert scale. The relative importance of these statements indicates that the respondents agree with their content and believe that the difficulty of providing Virtual Reality devices due to their high cost, the lack of qualified personnel capable of operating these devices, and the fear that technology might replace traditional museum and tourist site visits- all represent major obstacles to the implementation of such technologies.

In addition, respondents emphasize that the need for coordinated governmental efforts- involving several ministries such as the Ministry of Communication and Digital Technologies, the Ministry of Culture, and the Ministry of Tourism- constitutes another significant barrier to the widespread adoption of these technologies in national museums.

The overall standard deviation value (0.81) is lower than the overall mean value (4.32), which indicates a low level of dispersion in respondents’ opinions. This confirms the consistency and reliability of the data collected from the sample of the study.

Results of the General Hypothesis Test Based on the Significance of the Regression Model Fit:

To test the overall significance and goodness of Fit of the regression model, an (F-test) was conducted. The obtained F-value (432.865) is statistically significant at a level below (0.05), which indicates the validity and quality of the model’s Fit. This result confirms the significant effect of applying Virtual Reality (VR), Augmented Reality (AR), and other interactive technologies on the promotion of museum tourism, thereby supporting the main hypothesis of the study.

Based on the obtained results, it can be affirmed that there is a strong statistically significant relationship between the application of modern interactive technologies, such as Virtual Reality and Augmented Reality in museum displays, and the enhancement of museum tourism in general.

This finding represents one of the key outcomes of the study, emphasizing that the continuous improvement of museum display technologies in Algerian museums is an essential condition for improving their operational performance and increasing tourist activity, thus contributing to the enhancement of the national economy. Furthermore, the results confirm the social acceptability and readiness for adopting these technologies, as evidenced by the absence of statistically significant differences in respondents’ answers. This demonstrates the respondents’ support for integrating modern technological innovations within museum environments.

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References

Books

- Alexander, E. P., & Alexander, M. (2008). *Museums in motion: An introduction to the history and functions of museums* (2nd ed.). Library of Congress Cataloging-in-Publication Data.
- Ding, M. (2017). *Augmented reality in museums*. Arts Management and Technology Laboratory, Heinz College, Carnegie Mellon University.
- Mazuryk, T., & Gervautz, M. (1996). *Virtual reality: History, applications, technology and future*. Vienna: Institute of Computer Graphics, Vienna University of Technology.
- Sherman, W. R., & Craig, A. B. (2018). *Understanding virtual reality: Interface, application, and design*. (2nd ed.). Cambridge, MA.

Journal Articles and Conference Papers :

- Asmaa, A., Ahmed, M., & Hassan, S. (2017). Interaction in a three-dimensional virtual environment for enhanced presence experience. *Journal of Virtual Reality and Interactive Environments*, 12(3), 45–58.
- Feiner, S. K. (2002). *Augmented reality: New vision*. *Scientific American Magazine*, 286 (4), 34–41.
- Neghli, I. (2025, May 10). The Role of Algerian Museums in Promoting Cultural Tourism: Opportunities and Challenges. *Pegem Journal of Education and Instruction*, 15(4), 482–491.

Websites

- Ambient Interactive. (n.d.). *Multi-touch table and wall interactives*. Retrieved from <https://www.ambientinteractive.com/multi-touch-table-wall-interactives/>
- Canadian Museums Association. (2007). *Ethics guidelines*. Canadian Museums Association. <https://museums.ca/site/reportsandpublications/ethicsguidelines>
- Cortes, G., Marchand, E., Lécuyer, A., Brincin, G., & Brignin, G. (2018). *MoSART: Mobile spatial augmented reality for 3D interaction with tangible objects*. *Frontiers in Robotics and AI*, 5. <https://doi.org/10.3389/frobt.2018.00093>
- Merriam-Webster. (n.d.). *Museum*. In *Merriam-Webster.com dictionary*. Retrieved November 8, 2025, from: <https://www.merriam-webster.com/dictionary/museum>
- International Council of Museums. (1974). *The definition of a museum (Copenhagen, 1974)*. International Council of Museums (ICOM). <https://icom.museum/en/resources/standards-guidelines/museum-definition/>
- Bazazo, I. K. (2014). Application of interactive virtual reality technologies in marketing virtual tour routes. [Research paper]. ResearchGate. https://www.researchgate.net/publication/269994427_Application_of_Interactive_Virtual_Reality_Technologies_in_Marketing_Virtual_Tour_Routes

Arabic References

- Jaafar, A. N. (2007). *تكنولوجيا الواقع الافتراضي واستخداماتها التعليمية*. Amman: Dar al-Manahij
- Khamis, M. (2015). *تكنولوجيا الواقع الافتراضي، وتكنولوجيا الواقع المعزز، وتكنولوجيا الواقع المدمج*. The Egyptian Association for Educational Technology / *Journal of Educational Technology*, 25, 1
- l-Umrji, J. I. (2017). *أهمية استخدام تقنية الواقع المعزز في تدريس التاريخ للصف الأول الثانوي على تنمية التحصيل ومهارات التفكير التاريخي والدافعية للتعلم لدى الطلاب* [The effectiveness of using augmented reality technology in teaching history to first-year secondary students: Effects on achievement, historical thinking skills, and learning motivation.] *Al-Majalla Al-Tarbawiyya Al-Dawliyya Al-Mutakhasisa (Specialized International Educational Journal)*, 6(4), 135–155.
- Ashqar, K. J. (2022). *أثر تطبيق تقنيات العرض التفاعلية في المتاحف السورية على الجذب السياحي: دراسة حالة متاحف محافظة دمشق*. The impact of applying interactive display technologies in Syrian museums on tourist attraction: A case study of the museums of Damascus Governorate. *Al-Baath University Journal — Economic Sciences Series*, 44(27), 73–114.
- Ibrahim, M. (2017). *الواقع المعزز والافتراضي* [Augmented reality and virtual reality]. Conference of the Faculty of Education: Applications of Technology in Education, Benha University.