



TRANSFERRING CULTURAL HERITAGE ELEMENTS TO DIGITAL ENVIRONMENT: INNOVATIVE APPLICATIONS IN EDUCATION

TRANSFERINDO ELEMENTOS DO PATRIMÔNIO CULTURAL PARA O AMBIENTE DIGITAL: APLICAÇÕES INOVADORAS NA EDUCAÇÃO

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Abstract: The broad concept of cultural heritage, which encompasses both natural and historical structures, as well as the cultural environment, is of significant importance. Additionally, it encompasses intangible assets, including knowledge, experience, and beliefs, as well as enduring practices. The transfer of cultural heritage to digital media is a crucial process that contributes to the preservation of these values and facilitates their use in education. In today's world, digitalization is being effectively utilized in cultural heritage and education, as well as in every field. The purpose of this research is to examine the studies conducted in Turkey to date on the digital transfer of cultural heritage and its use in education, a topic of increasing relevance and interest. 'Google Scholar' will be used as the database for this research. In this context, the terms 'cultural heritage, digital media, and education' will be selected as search terms. The research will analyze studies conducted on this topic using various criteria to present the existing literature. Furthermore, the development trajectory in the relevant field will be highlighted, and gaps in the literature will be addressed. The study, which will utilize a purposive sampling technique, will analyze the data using bibliometric methods. Based on the results obtained at the conclusion of the research, recommendations for future studies will be provided, which may shape the direction of research in this field.

Keywords: Digital Media. Education. Cultural Heritage. Cultural Environment. Turkey.

Resumo: O conceito amplo de patrimônio cultural, que abrange estruturas naturais e históricas, bem como o ambiente cultural, é de grande importância. Além disso, abrange ativos intangíveis, incluindo conhecimento, experiência e crenças, bem como práticas duradouras. A transferência do patrimônio cultural para mídias digitais é um processo crucial que contribui para a preservação desses valores e facilita seu uso na educação. No mundo atual, a digitalização está sendo efetivamente utilizada no patrimônio cultural e na educação, bem como em todas as áreas. O objetivo desta pesquisa é examinar os estudos realizados na Turquia até o momento sobre a transferência digital do patrimônio cultural e seu uso na educação, um tópico de crescente relevância e interesse. O Google Acadêmico será utilizado como base de dados para esta pesquisa. Nesse contexto, os termos "patrimônio cultural", "mídias digitais" e "educação" serão selecionados como termos de busca. A pesquisa analisará estudos realizados sobre este tópico usando vários critérios para apresentar a literatura existente. Além disso, a trajetória de desenvolvimento na área relevante será destacada e as lacunas na literatura serão abordadas. O estudo, que utilizará uma técnica de amostragem intencional, analisará os dados utilizando métodos bibliométricos. Com base nos resultados obtidos na conclusão da pesquisa, serão fornecidas recomendações para estudos futuros, que poderão moldar a direção da pesquisa nesta área.

Palavras-chave: Mídia Digital. Educação. Patrimônio Cultural. Ambiente Cultural. Turquia.

Introduction

Cultural heritage, in its most general terms, is the totality of works (artistic, literary, architectural), knowledge, skills, and habits accumulated by societies over centuries. In other words, cultural heritage encompasses, on the one hand, historical monuments such as mosques, churches, fountains, castles, amphitheaters, palaces, and mansions, and, on the other hand, traditions, beliefs, literature, the Karagöz shadow play, handicrafts, and other cultural expressions. “Intangible cultural heritage” constitutes another aspect of cultural heritage. Intangible cultural heritage is defined as “practices, representations, narratives, knowledge, skills, and related tools, equipment, and cultural spaces that communities and individuals consider their own, passed down from generation to generation, and form a part of cultural identity” (Türker et al., 2012). In this sense, the digitalization of cultural heritage can be achieved through various applications and web environments.

For example, technologies such as VR, augmented reality (AR), 3D modeling, and virtual tour applications can be used to digitize a historical heritage (ancient city, mosque, church, museum, or open-air museum). In contrast, animations can be used to bring a fairy tale or epic to life. If the heritage is dance or music, these can be converted into videos and published on YouTube. On the other hand, if it is a manuscript or miniature, these can be illustrated and digitized in formats such as JPEG or PNG.

Digitalizing cultural heritage is crucial, and digitizing a cultural heritage element is not just for touristic or entertainment purposes. The digitalization of many cultural heritages (e.g., visual arts, ancient literary works, etc.) primarily enables them to be stored and preserved much more easily and securely. Of course, the digitalization of some heritages, such as architectural structures, does not ensure the physical preservation of the original structure. However, creating 4D images of a structure that a natural disaster might destroy allows it to be passed on to future generations in a different form.

Besides preservation, it can also enable many heritages to become more active tourist attractions. Someone from anywhere in the world who visits the “Antep Mosaic Museum” on digital media will often want to visit the museum live, and this will increase tourist activity (Yeniasır&Gökbüllüt, 2022).

Besides preservation and tourism, the digitalization of heritage also offers very valuable and effective platforms for education. It is evident that digital natives, in particular, are no longer able to adapt to learning solely through books and teacher instruction and are distracted in the classroom. Therefore, enriching education with digital tools and environments is not just a necessity but an exciting opportunity for students of the new age. At this point, the need for cultural heritage transmission supported by digital media becomes evident.

The use of digital heritage in education has the potential to enhance learning significantly. For instance, a student studying far from Istanbul who only sees information and images of the Sultanahmet Mosque may not gain a comprehensive understanding of it. However, a student who tours the mosque virtually, experiences it in VR, and also watches an informative YouTube video will learn far more and retain this knowledge better. This example illustrates the value of digital heritage in providing more immersive and engaging learning experiences that can pique students’ curiosity.

Methodology

Research Model

This research is based on a literature review and a bibliometric analysis, both qualitative research approaches. This study systematically examined academic studies conducted in Turkey on the digitalization of cultural heritage and its use in education. The research model aims to reveal the current state of knowledge in this area, outline its development, and suggest ways in which it could further evolve.

Sample

The research sample comprises academic publications selected using purposive sampling. Articles and presentations obtained using the keywords 'cultural heritage', 'digital environment', and 'education' were included. Publications directly related to the research topic, searched in the Google Scholar database, were included in the study. The study covers studies conducted between 2010 and 2025.

Data Collection

Data were obtained through searches of the Google Scholar database. Publications accessed via the specified keywords were initially evaluated based on their titles, abstracts, and keywords. Studies that were not directly related to the research topic were excluded from the sample. The identities, publication types, and content characteristics of the publications included in the study were recorded.

Data Analysis

The collected data were analyzed using bibliometric analysis. This method examined the subject trends, methodological approaches, and applications of the publications in education. Furthermore, content analysis identified prominent themes, trends, and gaps in the literature. Both quantitative distributions and qualitative interpretations were evaluated throughout the analysis process.

Research Questions

The purpose of this research is to examine the studies conducted in Turkey to date on the digitalization of cultural heritage and its use in education. To this end, the following research questions will be answered:

1. What studies have been conducted in Turkey on the digitalization of cultural heritage and its use in education?
2. What topics are prominent in these studies?
3. What gaps are there in the literature on the digitalization of cultural heritage and its use in education?
4. What work needs to be done in this area in the coming years?

Results and Discussion

Relevant studies on the subject were identified through the literature review and are evaluated below. The review section first examines studies that directly address digital heritage and its use in education, followed by studies that mention digital heritage but do not firmly establish its connection to education.

The first study directly addressing the relationship between digital heritage and education is "The Educational Role of Virtual Museums in Cultural Transfer: Ottoman Artifacts," prepared by Apan and Özdemir (2024) and published in English.

This article examines the educational role of virtual museums as a key tool in cultural transfer, within the context of representing Ottoman artifacts —a significant cultural heritage —within virtual museums. Museums, indispensable elements of cultural transfer and education in contemporary society, have gained the opportunity to reach a wider audience by transitioning to the digital environment. In this context, the representation of Ottoman artifacts in virtual museums and their role in cultural transfer are emphasized. It has also been noted that the representation of Ottoman artifacts in virtual museums has educational effects, such as expanding learning environments, facilitating access to information, and increasing cultural awareness.

This study demonstrates the educational potential of virtual museums by examining the role of representing Ottoman artifacts in cultural transmission and education. The research demonstrates that virtual museums serve as important tools for the preservation and dissemination of cultural heritage, and that the representation of Ottoman artifacts in virtual museums contributes to this process.

Another study, "Exploring Cultural Heritage through Virtual Museums: Prospective Social Studies Teachers' Views and Experiences of Virtual Museums," was conducted by Utkugün and Yıldırım (2024).

This study aimed to examine the views and experiences of prospective social studies teachers regarding virtual museums. Their visits to virtual museums were examined under various themes (archaeology museums, history and ethnography museums, science and technology museums, and nature and environment museums). It was determined that important sites such as Göbeklitepe and the Anatolian Civilizations Museum stood out (p. 467).

In the study, prospective teachers evaluated the use of virtual museums in social studies classes positively, citing reasons such as their ability to facilitate the teaching and learning process, support long-term learning, and make lessons more engaging. During the research process, prospective teachers designed various learning materials and activities using virtual museums, increasing their cultural awareness and contributing to educational life.

As a result of the research, it has been suggested that schools' technical infrastructure be strengthened, virtual museum content be enriched, prospective teachers be encouraged to use virtual museums as course materials, and virtual and physical museum visits be combined (p. 467).

Dündar et al.'s study, "Digitalization and the Sustainability of Cultural Heritage: A Study Based on Teachers' Views" (2025), also attempted to analyze social studies teachers' views on the impact of digitalization on the sustainability of cultural heritage within a scientific framework.

According to the research findings, teachers stated that digital applications play a significant role in the transmission and preservation of cultural heritage. In this regard, this research will make a significant contribution to the preservation of cultural heritage, its transmission to future generations, and the role of digitalization in educational processes. Furthermore, the findings are expected to inform educational policies and enhance teachers' awareness of the sustainability of cultural heritage (pp. 204-205).

Kılıç et al. (2023) conducted a training program titled "Virtual Museums in Education" for participants in their study titled "Virtual Museums in Education." The program included workshops by educators specialized in various fields.

During the seven-day training, participants received approximately 50 hours of theoretical and practical training on topics such as creative drama, museum drama, gamification, design-focused thinking, using Web 2.0 tools, museum pedagogy, virtual museum evaluation, and museum examples (p. 858).

The study concluded that teachers and graduate students have positive attitudes and perceptions toward the use of virtual museums in education; however, they require theoretical and practical knowledge on how to integrate virtual museums into existing classroom activities effectively. Therefore, the study recommended that teachers make websites offering free access to various teaching materials, especially learning scenarios for virtual museum applications, available to teachers (p. 863).

Çınar et al.'s (2021) study, «Student Opinions on the Use of Virtual Museums in Social Studies Classes,» also concerns virtual museums, a key component of digital heritage.

This study, conducted to determine the opinions of 7th-grade middle school students about the use of virtual museums in Social Studies class, provided information about virtual museums and conducted a sample virtual museum tour. Afterward, the students were provided with links to the War of Independence and Republic Museums for virtual tours. They were given worksheets prepared by the researchers for use during their virtual visits to the museums.

The study concluded that students believed virtual museum tours in Social Studies class would contribute to learning, as they provide an alternative to museum visits, eliminate time and space constraints, and enrich the classroom environment, making the teaching-learning process more enjoyable (162).

The students emphasized that the virtual museum visits they undertook as part of their

Social Studies course contributed to their learning, provided easy access to virtual museums, and enriched the classroom environment, making the teaching-learning process more enjoyable. This result suggests that students have a positive attitude toward the usability of virtual museums as educational environments in Social Studies classes (p. 164).

The other study evaluated is Mamur et al.'s (2020) "Digital Learning Experience in Museums: Cultural Readings in a Virtual Environment."

This study, conducted over seven months in seven cities across Turkey, was structured around the cultural and critical readings of primary and secondary school visual arts teachers regarding VR museum experiences through objects and representations.

According to the study results, although teachers emphasized that VR museum experiences cannot offer significantly richer experiences than real museum visits, they stated that the virtual museum experience can be practical for visual arts classes because it offers the opportunity to explore the museum without the barriers of distance and stimulates enthusiasm and interest in learning through digital technologies. It can be integrated with various learning activities (p. 335).

Based on the research results, it is recommended that teachers' awareness and competence be further enhanced through various in-service training activities to diversify remote access opportunities to museums in art classes using critical visual reading approaches.

In his study, "The Cultural Adventure of Riddles from Oral Culture to Digital Platforms," Türkylmaz (2025) provides a detailed explanation of how riddles continue to evolve in digital environments. In this context, a comparative study of traditional riddles and examples of riddles on digital platforms is conducted to assess their digital transformation and cultural continuity. The study's subheadings address topics such as websites, educational platforms, social media platforms, memes, mobile games and applications, digital books and e-books, and educational and interactive video content. It is noted that riddles are being used for educational purposes beyond their traditional form. It has been determined that riddles have become educational materials that support mental development on educational platforms such as MentalUP, Morpa Campus, and EBA (p. 808).

Halaç and Öğülmüş (2021) analyzed the digital datasets of cultural heritage held on Openheritage3D in their article, "Digital Storage of Cultural Heritage Data: The Openheritage3D Example."

Open Heritage 3D is a data-sharing network that makes three-dimensional digital cultural heritage data open and accessible. The application informs interested parties about the number of open-access heritage sites in each country, their locations, and which are currently published and which are in the process of being published (p. 525).

The article conducted an analysis and evaluation of Openheritage3D, a web-based platform that stores and makes publicly available digital cultural heritage data. However, no detailed analysis was conducted regarding its use in education. Regarding education, the platform can be used in cultural heritage education and contributes to the sustainability of cultural heritage (p. 537).

Doğan's (2024) study, "The Transformation of Cultural Heritage into Digital Heritage: Examples of Museums and Archaeology," provides general information under headings such as "Digitalization of Cultural Heritage and Memory, New Media and Digitalization, Transformation of Cultural Heritage into Digital Heritage, and Digitalizing Museums and Archaeology." The section titled "Digitizing Museum," which relates to the main topic of the study, discusses the techniques (AR, VR) and tools used in the digitalization of museums.

The study briefly touches upon the use of digital archaeology museums in education. Regarding education, it is mentioned that the digitalization process also provides opportunities for "distance education" and "e-education" related to museums. Furthermore, through online education, museums and participants can interact (p. 177).

Vargün and Nuhoglu's (2019) study, titled "The Role of Information and Communication Technologies and Mobile Applications in Cultural Heritage Education," evaluated the contribution, creative possibilities, and shortcomings of information and communication technologies (ICT), augmented reality (AR), and mobile applications to cultural heritage education by examining existing mobile applications.

The study did not provide details about how the education would be conducted; only a

general introduction and explanation of the technologies in question was provided. However, it is an important study because it offers insight into how digital technologies can be effectively utilized in education.

Okdan et al.'s (2024) study, "Digitalizing Traditional Dance Repertoire in a Format Suitable for Teaching," aimed to ensure the sharing, transfer, and sustainability of this information through a digital archive created by recording traditional dance content. Furthermore, the aim was to digitize the traditional dance repertoire, making it convenient and accessible in educational settings.

The study also aimed to "record 152 traditional dance repertoires selected from 17 Anatolian provinces in a format and environment suitable for teaching." By transferring the archives to the Audiovisual Specialization Archive of the Ege University Library and Documentation Department, the cultural material has been archived in a digital environment and made accessible to the public, providing a cultural resource that students can access at any time during and after their education." (p.36)

In their study titled "Digital Libraries as Cultural Heritage Carriers: The Dresden Digital Copy of the Book of Dede Korkut," Demritel et al. (2023) aimed to reveal the importance of digital libraries in terms of cultural heritage through the digitized copy of the Book of Dede Korkut in the digital collections of the Dresden Digital Library (p.333). This study examines the detailed impact of digital libraries on the continuity of cultural heritage and their cultural functions. It evaluates their new opportunities for preserving, developing, and presenting cultural heritage. However, the study does not address how the digital presence of manuscripts considered cultural heritage in libraries will be used concretely in education. However, ubiquitous access to digital books will greatly facilitate education and become an important resource (p. 334).

Conclusion

This study examined articles and presentations published between 2010 and 2025 in Turkey that addressed the digitization of cultural heritage and its application in education. Findings obtained through a literature review and bibliometric analysis suggest that the digitisation of cultural heritage is becoming a more widely discussed topic, with applications such as virtual museums, augmented reality (AR) and virtual reality (VR) technology, digital archives, and online educational platforms becoming more prominent.

According to the results, digital applications play a significant role in preserving cultural heritage, transmitting it to future generations, and promoting long-lasting learning in education. In particular, utilizing virtual museums in educational settings enhances students' cultural awareness and enhances the effectiveness of the learning process. Furthermore, the integration of digital heritage tools into educational processes by teachers and students contributes to more engaging and interactive lessons.

However, some limitations are also evident in the literature. Most studies focus on virtual museum applications, but the relationship between other digitization methods (e.g., digital libraries, digital gamification, mobile applications) and education is not adequately and in-depth addressed. Furthermore, many teachers lack the knowledge and experience to integrate digital heritage tools into their lessons effectively, and the technical infrastructure of many schools is inadequate for supporting these applications.

In conclusion, digitalising cultural heritage is strategically important for preserving cultural values and enhancing educational effectiveness. In this context, the digitisation of cultural heritage serves as both a preservation method and a powerful educational tool, directly contributing to the recognition, understanding, and acceptance of cultural identities among future generations. Future studies on the use of digital heritage in education are also crucial. Future research could examine the effects of digital heritage applications on student achievement, motivation, and sense of cultural belonging in detail. Comparative studies across different age groups and different subjects could be conducted to diversify the effects of digital heritage on learning. Publications in various databases could also be reviewed. Furthermore, integrating new technologies, such as VR, AR, mobile applications, and game-based learning methods, into cultural heritage education could significantly advance the field.

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