

Ai in Heritage Education: Teaching History through Iconography

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Abstract

The integration of Artificial Intelligence (AI) into educational practices offers innovative opportunities for fostering cultural heritage awareness among primary school students. This study presents a pedagogical framework for employing AI-generated image content to teach the iconography and iconology of saints depicted in the Church of Santa Maria in Vallo di Nera. Through this approach, AI serves as a tool to create visually engaging and age-appropriate educational materials, facilitating children's exploration of religious imagery while deepening their understanding of historical and cultural contexts. The primary objective of this initiative is to enhance students' visual literacy and critical thinking skills by interpreting religious symbols and their associated narratives. By focusing on the saints represented in the frescoes and artworks of Santa Maria, the proposed educational strategy introduces children to the rich cultural and spiritual traditions embedded within medieval art. AI-generated visual aids, tailored to the cognitive and emotional development of primary school learners, provide simplified yet accurate representations of saints and their attributes, such as Saint Leonard with chains symbolizing the liberation of prisoners or Saint Antony with a pig because of monks of Saint Anthony reared pigs whose lard was employed as a medicinal remedy against the so-called "Fire of Saint Anthony". This educational framework is designed to align with constructivist pedagogical principles, fostering collaborative learning, historical contextualization, and inquiry-based exploration. Students engage with AI-generated illustrations, enriched with interactive elements such as puzzles and questions, to examine the broader social, cultural, and theological significance of these artistic depictions. For example, prompts encourage students to consider why saints were linked to specific symbols and how these representations reflected societal values and spiritual beliefs of the time. Moreover, this method bridges art, history, and traditions to educational approach, making it a multidisciplinary tool for cultivating cultural sensitivity and historical awareness. By combining AI's capacity to generate diverse visual materials with the pedagogical goal of making cultural heritage accessible, this approach underscores the transformative potential of technology in preserving and transmitting the intangible values of historical art to younger generations.

Keywords: *Iconography, Iconology, Cultural Heritage, Digital Technology, Art, Education*

1. Introduction

The integration of Artificial Intelligence (AI) in educational settings is revolutionizing traditional teaching approaches, particularly in the creation of visual content for children. AI-powered image generators, which transform textual descriptions into detailed and engaging illustrations, provide new opportunities for the development of personalized educational games, fostering creativity and active learning. This article explores practical applications in classrooms, as well as the pedagogical and ethical implications of AI usage, drawing on concrete examples such as DALL-E, Storywizard AI, Akool for Creative Text-to-Image Generation, and MidJourney [1].

2. Iconography in School

The term *iconography* derives from the Greek nouns *eikón* (image) and *graphé* (writing, graphic representation of signs). This discipline focuses on the study of the themes contained in images, with particular attention to their classification, description, interpretation, and evolution within specific historical contexts. A correct iconographic analysis serves as a fundamental premise for *iconology*, a discipline that investigates the symbolic, allegorical, emblematic, metaphorical, and ideological meanings of images, the subjects represented, the composition, and the content of a work of art [2].

The study of iconology was extensively explored by Panofsky, who, in his essay *Meaning in the Visual Arts* (1962), highlighted the crucial role of iconography and iconology in interpreting the meanings of artworks. He emphasized how these elements reflect the ideas and beliefs of a given culture and society, allowing a

deeper understanding of the relationship between the artist and the historical context in which they operated [3].

Iconographic studies began to develop in the second half of the sixteenth century with the aim of analyzing the themes, subjects, and events depicted in works of art. They prove to be fundamental tools for dating artworks, determining their provenance, and verifying their authenticity. However, iconographic analysis requires an interdisciplinary approach that integrates various fields of study, including history, literature, religion, and mythology. These disciplines contribute to understanding the specificity of the artwork and its multiple relationships with the cultural context in which it was produced.

In the school environment, iconographic recognition allows artworks to be placed within their original culture, facilitating the interpretation of connections between images and other aspects of cultural life at the time they were created. Therefore, it is essential for teachers to convey to students the importance of an interdisciplinary approach in the study of artworks, enabling them to develop a broader and more conscious understanding of artistic and cultural heritage.

3. Cards in Play: The Iconography of the Frescoes of Santa Maria in Vallo di Nera Explained to Children

The primary objective of this project is to introduce primary school students to the critical analysis of images and iconographic symbols related to saints, fostering a deeper understanding of the historical, social, and cultural context in which such representations originated. Through observation and interpretation of images, students will be encouraged to reflect on the values, traditions, and beliefs of medieval and Renaissance societies while also promoting critical thinking and visual literacy skills.

The game is structured around three types of cards: **Illustrated cards**, depicting saints with their distinctive iconographic attributes. **Context cards**, describing elements of medieval and Renaissance society, such as trades, historical events, and religious traditions. **Riddle cards**, containing questions or riddles related to the symbolic meanings of saints' attributes.

For example, the card depicting Saint Catherine features the iconography of the spiked wheel, while Saint Leonard is represented by shackles, symbolizing his role as the protector of prisoners. Context cards provide cultural insights, such as the connection between saints and animals in medieval symbolism, highlighting their protective roles. Lastly, riddle cards pose reflective questions, such as: "Why were saints often associated with animals? What values did these representations convey?" [4]

The game can be played both collaboratively and competitively, with multiple phases. During the preparation phase, the cards are shuffled and distributed among players, assigning each student a saint card and two context cards. In the next phase, students analyze the images of the saints, observing their iconographic details, such as Saint Anthony the Abbot, traditionally depicted with a piglet, symbolizing the Antonine monastic practice and the use of animal fat as a remedy for herpes zoster. Subsequently, players must match their saint card with the relevant context cards, establishing logical connections between the provided information.

Once the matching is completed, other players or the teacher read a riddle card, posing questions that require critical analysis of the images. For instance, in the case of Saint Christopher, students are asked to reflect on the meaning of the child he carries on his shoulders and its symbolic representation. Points are awarded based on the correctness of the matches and responses, with the teacher intervening when necessary to provide historical and cultural insights [5].

From an educational perspective, the game promotes several competencies. Firstly, it strengthens image education by enhancing students' ability to observe and interpret iconographic representations. Additionally, it aids in historical contextualization, allowing students to understand aspects of medieval society, such as the symbolic role of animals in popular religiosity or the perception of divine protection during travel, as illustrated by the figure of Saint Christopher. The game also fosters collaborative learning, encouraging peer dialogue and the exchange of ideas, and stimulates critical thinking by analyzing the relationships between images, symbols, and historical contexts [6].

This educational game serves as an effective tool to combine fun with cultural discovery, transforming religious iconography into a pedagogical means for understanding history and society. The project can be integrated into interdisciplinary curricula involving subjects such as Italian, history, religion, and art, promoting meaningful and engaging learning experiences.

4. AI Image Generators for Education

AI image generators, such as DALL-E and MidJourney, utilize deep learning architectures based on transformer neural networks and diffusion models. These systems are trained on extensive datasets containing text-image pairs, learning to recognize visual patterns associated with specific linguistic descriptions. For example, when a user inputs the prompt: "The church of Santa Cristina is located in the



middle of a pine forest. Its double-pitched façade is characterized by small blocks of dressed stone arranged in rows. The building was modified with the addition of a small bell tower," the model analyzes syntax, adjectives, and nouns, activating neurons associated with concepts such as "church," "pine forest," "double-pitched façade," and "small bell tower." The generation process occurs through an iterative optimization mechanism in which the AI progressively adjusts pixels to align with both the textual prompt and visual coherence.

Furthermore, tools like Storywizard AI and Ryan AI demonstrate how these models can be adapted for educational contexts. By limiting input vocabulary to age-appropriate terms and incorporating filters to exclude inappropriate content, these platforms ensure safety for younger users. Ryan AI, for instance, offers dynamic adaptation features: if a child changes the protagonist from "angel" to "shepherd," the system not only regenerates the character but also adjusts the background, maintaining narrative coherence [7].

5. Conclusions

The integration of AI-generated imagery into educational practices presents innovative opportunities to enhance students' engagement, creativity, and cognitive development. By employing AI tools in the study of religious iconography and historical artworks, educators can facilitate deeper connections between students and cultural heritage, making learning experiences more interactive and inclusive.

The use of multimodal AI capabilities can accommodate diverse learning styles (Gardner, 2013), making education more accessible. For instance, visual learners benefit from concept maps illustrated by AI, while auditory learners can engage with text-to-speech storytelling that synchronizes with AI-generated images. Additionally, AI can simplify textual descriptions, adapting them to different age groups and incorporating high-legibility fonts for improved accessibility [8].

Ultimately, AI-assisted learning fosters interdisciplinary engagement, bridging the gap between history, art, literature, and technology. Teachers, as digital mediators, play a crucial role in guiding students toward responsible AI usage, ensuring that these tools are leveraged ethically and effectively to enrich the educational experience.

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