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Article

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Abstract: This study explores the use of AI art generators to enhance formal analysis skills in AP Art History students, with a focus on Islamic Art and Architecture. Students, often entering the course with high academic achievements, find the unique challenge of articulating detailed visual descriptions of artworks. The study's approach involves using AI image-generation websites, like wepik.com, where students create AI images resembling Islamic artworks studied in class. This method aims to refine their descriptive skills, focusing on visual evidence rather than relying on identifying details. The choice of Islamic Art, markedly different from other historical periods covered in the curriculum, is intended to boost retention and learning engagement. The results show that students were more successful in describing architectural artworks compared to two-dimensional narrative pieces, with limited site access and the need for iterative description refinement being key challenges. Successful attempts were marked by precise vocabulary usage and detailed descriptions, resulting in AI images closely matching the original artworks. In contrast, less successful attempts revealed deficiencies in comprehensive and detailed descriptions, particularly in narrative artworks. These outcomes highlight the potential and limitations of AI tools in art history education, suggesting that their effectiveness depends largely on the depth and precision of student inputs. The study not only demonstrates the innovative application of AI in education but also underscores the importance of detailed visual analysis, pointing towards future enhancements in AI-assisted educational methodologies.

Keywords: AI art generation; AP Art History; Islamic Art and Architecture; formal analysis skills; educational technology

1. Introduction

Art history education has predominantly relied on a pedagogical blend of lectures and interactive discussions, with a strong emphasis on visual analysis and detailed observation [1]. This pedagogical method, commonly known as formal analysis, involves a thorough scrutiny of an artwork's visual attributes, systematically describing and evaluating these elements using a repertoire of standard terms and concepts such as format, scale, composition, perspective, depiction of figures and space, and the application of form, line, color, light, and texture [2]. The objective of this approach is to interpret and articulate the visual experience of art, enabling students to appreciate not merely the content or historical backdrop but the intrinsic artistic form and its influence on the audience. As the field has evolved, the perception of formal analysis has transitioned from a belief in a universal human reaction to visual stimuli to a recognition of a more individualized

interpretation. Despite these changes, formal analysis continues to be a vital component of art historical pedagogy, particularly in foundational courses [3].

In the realm of formal analysis within art history education, instructors typically implement a range of assignments aimed at sharpening students' abilities in detailed observation and critical analysis. One prevalent exercise is the in-depth observation task, where students dedicate substantial time to scrutinizing a single piece of art, meticulously observing every element from the intricacies of brushwork to the subtleties of lighting and coloration [4]. This practice enhances their ability to discern subtle artistic details and deepens their comprehension of artistic methods. Additionally, a standard pedagogical tool is the comparative analysis essay. In this exercise, students choose two pieces of art, often originating from differing eras or styles, and examine both the parallels and distinctions in their form, technique, and thematic content [5]. This activity prompts students to critically evaluate the influence of varying historical contexts and artistic movements on visual representation. The end goal of such analyses is to generate descriptions that vividly convey the visual experience, transforming visual perceptions into articulate verbal representations that allow readers to form a mental image of the discussed artwork. These descriptions highlight crucial aspects of the artwork, including its composition, color and light usage, thematic elements, and stylistic features. Mastering the skill of crafting such vivid, comprehensive descriptions is essential in art history, as it empowers students to effectively communicate their visual observations and insights [6].

As traditional methods in enhancing formal analysis skills in students have predominantly been non-digital, there is an emerging trend towards incorporating digital tools [7]. Innovations in digital art history, spearheaded by technologies like virtual reality (VR), have significantly bolstered these skills. VR, offering an immersive experience akin to viewing art in person, has been instrumental in advancing critical analytical skills in the field of art history [8]. Yet, the full potential of generative artificial intelligence (AI), particularly AI art generators, as an adjunct tool in art history remains underexplored. These AI tools present a novel avenue for students to engage deeply with the elements of art such as composition, style, and technique, thereby not only reinforcing their understanding of art history but also acquainting them with AI's role in art creation and analysis. As noted by Zullich et al. [9], AI emerges as a promising tool in the digital art history classroom, augmenting technologies like VR and expanding pedagogical approaches in art historical analysis.

Integrating these conventional methods with prompt engineering for AI visual models, such as Dall-E 3, Midjourney, or Stable Diffusion, offers a compelling expansion of these analytical skills. In AI, prompt engineering involves the creation of detailed prompts to direct AI in generating specific visual outputs, mirroring the intricacies of formal analysis in art history where meticulous attention to detail and the translation of visual elements into explicit, descriptive language are essential. However, with these innovative AI tools, the descriptions serve as inputs for the AI model to produce visual representations [10]. By using their formal analysis skills in prompt engineering, students can learn to adeptly navigate generative AI tools, generating prompts that lead to accurate visual reproductions of historical artworks. This convergence of traditional art historical methodologies with contemporary AI

technology represents an innovative and potentially influential approach in art education, merging detailed observation and descriptive acumen with digital creativity [11].

In the realm of secondary education, particularly in Advanced Placement (AP) Art History courses for students in grades 10 through 12, there exist unique pedagogical challenges. Students often enter these courses with high expectations, having achieved academic success in prerequisite Honors History and English courses. However, they soon encounter a steep learning curve, realizing that the ability to interpret history through the lens of art is not an innate skill but one that requires dedicated learning, training, and continual development. A fundamental aspect of AP Art History education involves familiarizing students with the identifiers of artworks, known as LEAFPDF (Location, Era, Artist, Form, Patron, Date, and Function), along with the content and context of the artworks. While students frequently recount this information in written Free Response Questions, a significant challenge arises when they are required to provide "visual evidence." The ability to descriptively and vividly articulate artwork, as though explaining to someone who has never encountered the piece, is a skill that needs extensive practice and is crucial across various educational disciplines.

To address this challenge and inspire skill application through engaging methods, the study employed AI image-generation websites, such as wepik.com. Students utilized their allocated attempts to create AI images resembling the artworks they had studied, with a particular focus on the Islamic Art chapter. This choice was deliberate; Islamic art and architecture, with its distinct characteristics and divergence from Christian art of the Middle Ages, provides an excellent contrast for enhancing retention and facilitating memorable art learning experiences. However, students encountered difficulties, particularly with two-dimensional narrative works, underscoring the need for more practice and refinement in their descriptive abilities. Additionally, limitations in website access highlighted the necessity for more iterative attempts to improve accuracy in their AI-generated images.

The methodology of the study, focusing on AI-assisted visual recreation and analysis, addresses these pedagogical challenges by providing a novel and interactive approach to learning formal analysis in AP Art History. This approach not only aids in developing descriptive skills of students but also introduces them to innovative digital tools, thereby enriching their learning experience. The study's findings contribute significantly to teaching and learning in AP Art History courses, demonstrating the potential of AI tools in enhancing students' ability to analyze and articulate visual elements of art, an essential skill in their academic and future professional endeavors.

2. Literature review

The instruction of formal analysis and close observation in art history classes is essential for developing a comprehensive understanding of both art history as a discipline and the nuanced details of individual artworks. This teaching method underscores the importance of meticulous observation and the effective

communication of visual elements, fundamental aspects of formal analysis. Walton [12] underscores the importance of accurately articulating the visual attributes of art, a key competency in the field of art history. Gasper-Hulvat [13] argues that formal analysis, which focuses on the form and structure of artwork, is typically the cornerstone of art historical study and plays a crucial role in art discussions, especially when combined with other interpretive methods. This analytical approach involves an intensive visual examination of artworks, concentrating on their constituent elements and the design principles utilized by artists in various media.

In art history curricula, students are engaged through diverse assignments aimed at fostering these analytical skills. These tasks vary from visual analysis essays, which center on the artwork itself, to comparative essays and research papers that may include primary texts for a more comprehensive contextual understanding [14]. Visual analysis essays, in particular, focus on close observation, often reducing the dependence on a broad range of secondary sources [15]. Such assignments are structured to refine students' capabilities in observation and articulation, thus enhancing their grasp of art historical methodologies and the artworks under study. Successfully completing these assignments necessitates a clear understanding of the given prompts, highlighting the need to match analytical skills with specific scholarly requirements [16].

The scholarly examination of formal analysis in art history unveils its complex role and the evolution of its methodologies. Olin [17] investigates the historical development of formal analysis in the United States, tracing its beginnings to the 19th century. Initially, formal analysis was seen as a detached, scientific method for classifying and interpreting art. However, Olin contests this perception, arguing that formal analysis functioned more as a superstructure, appearing foundational due to its authoritative status. The study also examines the links between art history and scientific fields, such as comparative anatomy and physical anthropology, highlighting a case study of collaboration during the "Great War." Earlier, Prown [18] distinguished the unique role of art historians, who primarily focus on artworks. He differentiates between "formal analysis" and "stylistic analysis," concentrating on the art object's structure and style, respectively. Prown suggests that style, as a fusion of form and unique manner, is culturally expressive and thus valuable for understanding broader cultural narratives beyond art history.

In 2015, Locher et al. [19] examined how formal art training affects the perception and aesthetic judgment of art compositions, probing whether such training enhances the analysis of compositional elements and influences aesthetic evaluations, especially in artworks with varied balance and symmetry. Following this, Nelson [20] focused on employing Visual Thinking Strategies (VTS) in art and information literacy instruction. Developed by Housen and Yenawine, VTS uses art discussions to foster participation, critical thinking, and meticulous observation. Nelson demonstrates how VTS not only improves research strategies but also ties to formal and critical analysis in art history. These studies collectively underscore the dynamic essence of formal analysis in art history education, highlighting evolving methodologies, pedagogical importance, cross-disciplinary applications, and innovative teaching techniques.

These examples underscore that teaching formal analysis and close observation in art history involves guiding students to cultivate skills in detailed observation, critical thinking, and effective articulation of their analyses. It is crucial for students to comprehend art elements and design principles, and to learn to analyze and discuss art, starting with formal analysis. Such teaching is vital for developing students' abilities to analyze and interpret artworks, involving close observation, critical thinking, and understanding of art elements and design principles, crucial for delving into art histories and communicating about art effectively [21]. Additionally, recent scholarship in teaching and learning related to formal analysis in art history has indicated a significant shift towards enhancing student engagement and learning outcomes, particularly in online settings. Kutis [2] explores this evolution and presents a case study that highlights the importance of structuring assignments in online courses, especially in introductory art history classes. This approach involves breaking down the traditional formal analysis assignment into smaller, more manageable tasks using the learning management system (LMS), Canvas.

The shift to online learning environments introduces distinct challenges, particularly in sustaining effective interaction between teachers and students and in providing immediate support for complex assignments. Kutis underscores the effectiveness of scaffolding assignments in enhancing student achievement. This approach involves creating a series of smaller tasks that cumulatively lead to a more complex project. Scaffolding not only affords students repeated opportunities to develop their visual analysis and writing skills but also facilitates ongoing instructional feedback. These practices are acknowledged as exemplary in teaching and learning pedagogy. By focusing on distinct elements of the overarching formal analysis task in each smaller assignment, students gradually hone their abilities. This technique is especially beneficial in online environments where direct teacher-student interaction is less frequent, allowing for continuous instructor guidance. Quantitative evidence from this approach indicates that scaffolding significantly bolsters student learning and achievement, highlighting its value in equipping students with the critical skills required for formal analysis in art history. This strategy is particularly relevant in the context of self-regulated learning, addressing the changing needs of students in a digital landscape.

Moving from Kutis's [2] emphasis on using LMS to segment formal analysis into manageable components, we enter the burgeoning field of text-to-image AI technology, a paradigm shift in art history education. While these tools have been extensively explored for art creation, their application in art history education is still largely unexplored [22]. AI art prompts, textual instructions that direct text-to-image generators to produce original artworks, leverage AI algorithms trained on vast visual art datasets, enabling the AI to replicate various artistic styles and techniques. Notable advancements in this area, particularly with tools like Dall-E and Stable Diffusion, introduce exciting prospects for visual arts education. Dehouche and Dehouche [23] investigate the impact of these AI programs in art history, aesthetics, and technical training, analyzing a substantial dataset of 72,980 Stable Diffusion prompts. Their research contributes to formalizing this novel art creation approach, revealing that Text-to-Image AI harbors the potential to transform art education, offering cost-effective and creative opportunities for experimentation and expression.

However, these advancements also raise concerns about the ownership of AI-generated artworks, necessitating new legal and economic frameworks to safeguard artists' rights [24]. The adoption of AI in art history education marks a significant stride in exploring innovative methodologies and addressing contemporary challenges in the discipline.

Building upon these insights, Gu et al. [11] present an exhaustive analysis of prompt engineering—a method that enhances large pre-existing models with tailored cues, known as prompts, to modify the model for new tasks. Their study examines the latest developments in prompt engineering across various types of vision-language models, including multimodal-to-text generation models (such as Flamingo), image-text matching models (like CLIP), and text-to-image generation models (e.g., Stable Diffusion). Gu et al. provide detailed overviews of these models, their prompting techniques, applications, and the associated ethical and integrity challenges. Their research highlights the importance of prompt engineering in connecting vision-language models with practical applications and outlines the challenges and future prospects in this swiftly advancing area. Both these studies underscore the revolutionary impact of AI in visual arts education, particularly in the instruction of art history and formal analysis, while also recognizing the ethical and legal concerns inherent in this technological advancement.

In the realm of visual arts education, the integration of text-to-image AI prompts contemplation about the role of artistic intention. Concerns exist that reliance on AI systems could constrain the diversity of student expressions, potentially leading to a uniformity in artistic outputs. However, these technologies also offer unique advantages. AI art generators can deepen students' understanding and appreciation of various artistic styles, movements, and techniques. Through the use of specific prompts and style selections, students are able to create AI-generated art that mirrors a range of historical periods and artistic practices. In art history instruction, AI art generators can be particularly effective. They offer an innovative and interactive method for students to engage with and scrutinize historical artworks, styles, and techniques. This methodology not only promotes an active learning approach but also acts as a catalyst for creativity and imagination, enabling students to explore the myriad possibilities of artistic expression through a contemporary, digital medium.

Before moving on to the methodology, it is pertinent to note that the College Board still recommends a traditional approach to teaching formal analysis in AP Art History classes. Resources such as the Art History Teaching Resources website (https://apcentral.collegeboard.org/courses/ap-art-history) provide educators with ideas, guidance, and rubrics for formal analysis assignments, assisting in the development of students' analytical skills. The current pedagogical approach in AP Art History thus encompasses a blend of visual and contextual analysis, supplemented with practical guidance and resources for educators, aligning with traditional methodologies while also embracing contemporary innovations.

3. Methodology

In this study, the effectiveness of AI art generators in enhancing the formal

analysis skills of high school students enrolled in AP Art History courses is explored through a mixed-methods approach. This methodology combines quantitative assessments, captured through pre- and post-study surveys of student knowledge and attitudes towards AI in art history, with qualitative analyses of student written works and feedback. The integration of AI art generator assignments into the AP Art History curriculum ensures these activities both complement and extend the standard educational content, offering a seamless blend of traditional learning with innovative digital tools. The design of the study is structured to provide an evaluation of the educational value of the tools in art history, employing a sequence that includes participant recruitment, informed consent, baseline and endpoint assessments, instructional sessions on tool usage, and a series of AI-based assignments aimed at refining student visual description and formal analysis skills.

Following the initial phase focused on recruitment and consent, the study progresses through a series of structured activities and assessments. These include a pre-study survey to establish baseline knowledge, instructional sessions to familiarize students with AI art generators, and AI-based assignments embedded within the curriculum of the course. Mid-study and post-study surveys, alongside feedback sessions conducted via the LMS/Canvas, facilitate ongoing evaluation of the intervention's impact. The assignments, designed to encourage application and refinement of visual analysis skills, offer students alternative tasks to ensure equitable participation regardless of research involvement. Data analysis incorporates statistical evaluation of survey responses and thematic analysis of qualitative data, culminating in a debriefing session that shares preliminary findings and gathers final participant feedback. The structured approach not only augments student learning experiences by integrating cutting-edge technology into art history education but also provides insights into the broader potential of generative tools to innovate pedagogical practices in the humanities.

The study was conducted with high school students enrolled in AP Art History courses, specifically those in the 10th grade (15–16 years old), 11th grade (16–17 years old), and 12th grade (17–18 years old). These students typically enter the course with expectations of success, having secured their place through high achievement in Honors History and English courses. However, they soon encounter the complexities of analyzing art from a historical perspective. The primary learning objective was to enhance students' skills in visual description and analysis, a crucial aspect of AP Art History. This skill is not innate but requires development and practice. Students are expected to learn about the identifiers of artworks, known as LEAFPDF (Location, Era, Artist, Form, Patron, Date, and Function), along with the content and context of the artworks.

To engage students and encourage the application of their skills in a novel and entertaining way, an assignment using AI image-generation websites was designed (**Table 1**). The website wepik.com was chosen for this task. Each student was given 10 free attempts to generate an AI image that resembled an artwork they had studied in class. The focus was on the Islamic Art chapter, selected for its distinct contrast to Christian art of the Middle Ages, thereby enhancing retention and creating a memorable learning experience. Students could choose from the following list of

artworks for their assignment, all part of the College Board's required works for the Islamic Art section:

- #85. Mosque of Selim II
- #183. The Kaaba
- #185. Dome of the Rock
- #186. The Great Mosque of Isfahan
- #187. Folio from the Qur'an
- #188. Basin of St. Louis (Baptistere de Saint Louis)
- #189. Bahram Gur Fights the Karg
- #190. Court of Gayumars
- #191. Ardabil Carpet
- #209. Taj Mahal

Table 1. AI Islamic art/architecture assignment.

Step	AI Islamic art/architecture assignment description
1	Download the PowerPoint Template from Modules.
2	Title the PowerPoint with your name and date.
3	Visit https://wepik.com/ai to generate AI images of art.
4	Type in a description of each work of art from the Islamic Chapter (see list below).
5	Generate an AI image. Aim to create an AI image that closely resembles the Islamic artwork without using specific identifiers (title, era, patron, artist, location, etc.).
6	The first two artworks (the Pyxis of al-Mughira and the Alhambra) are completed as examples.
7	Free download or screenshot the generated image and insert it into the corresponding PowerPoint slide. Note: You only get 10 free attempts.
8	Copy/paste the description you entered that created the most accurate image compared to the original artwork.
9	Copy/paste the actual image of the artwork.
10	Submit your work when completed.

After studying the 12 required works of art, students engaged in the AI assignment to practice their visual description skills. The instructor provided two completed examples (the Pxyis of al-Mughira and the Alhambra) to guide students on expected outcomes. The task required students to focus on visual evidence alone, avoiding the use of key identifying facts, thereby emphasizing the use of pictorial descriptive skills and specific vocabulary terms relevant to each work. The AI site generated four different potential images based on the students' descriptions. Students then compiled these AI-generated images into a PowerPoint presentation alongside images of the original artwork and the descriptions used to create the AI version. This format allowed for a direct comparison between the students' interpretations and the original artworks, providing a clear framework for evaluating their descriptive skills and understanding of the artworks.

The completed PowerPoint presentations served as the primary data for evaluation. The effectiveness of the visual descriptions of the students was assessed based on how closely the AI-generated images resembled the original artworks (**Table 2**). This evaluation focused on the accuracy of the descriptive language used and the students' ability to capture the essential visual elements of the artworks

without resorting to key identifying facts. The assessment also considered the students' understanding and application of specific art historical vocabulary relevant to Islamic Art. The ultimate goal of this methodology was to enhance students' ability to conduct formal analysis through a unique, technology-driven approach. By engaging with AI tools and focusing on visual description, students were expected to develop a deeper understanding of the artworks, improve their descriptive vocabulary, and enhance their overall ability to analyze and communicate about art.

Table 2. AI art assignment grading rubric.

AI Islamic art and architecture assignment rubric

Categories	Exceptional, 5 points	Okay, 3 points	Needs Improvement, 1 point	Incomplete, 0 points
Description of Artwork	Artwork description is full, accurate, includes all evidence of color, shape, scenery, size, figure, spacing, composition.	Artwork description is somewhat accurate though it may lack some key evidence of only three or four of the categories: color, shape, scenery, size, figure, spacing, and composition.	Artwork description is extremely lacking and shows no effort to include all aspects of visual evidence and may be missing 5 or more details such as color, shape, scenery, size, figure, spacing, and composition	Artwork description is not present or completely inaccurate.
AI Generated Image	AI generated image is mostly accurate outside of minimal details.	AI generated image is somewhat accurate with a few obvious incorrect details.	AI generated image is mostly inaccurate with many obvious incorrect details.	AI generated image is not present or completely inaccurate.
Accurate Use of Vocabulary	3 or more examples of accurate use of vocabulary is present in the description.	1–2 examples of accurate use of vocabulary is present in the description.	Only 1 example of accurate use of vocabulary is present in the description.	Description is not present or completely lacking the use of vocabulary.
Effort, Presentation	Final PowerPoint submission includes AI website description input, the original image of the artwork, and the AI generate image of the artwork. All images and descriptions fit within their respective spacing on each slide.	Final PowerPoint submission includes AI website description input and the AI generated image of the artwork, but may exclude the original image of the artwork. 6 or more images and descriptions fit within their respective spacing on each slide.	Final PowerPoint submission includes AI generated image of the artwork, but may exclude the AI website description input and the original image of the artwork. 5 or less images and their descriptions fit within their respective spacing on each slide.	Final PowerPoint submission is not present or completely lacking in the inclusion of AI generated image of the artwork, AI website description input, and an image of the original artwork. Most images and their descriptions (if present) are not formatted to fit within their respective spacing on each slide.

Following the assignment, students were encouraged to reflect on their experiences and the challenges they faced in using AI for art analysis. This feedback was integral in understanding the effectiveness of the methodology and in identifying areas for improvement in future iterations of the assignment. The feedback also provided insights into the students' engagement with the task and their perception of AI as a tool in art history education.

4. Results

The study revealed a notable success rate among students in describing architectural works of art. Notably, the AI-generated images for architectural pieces like the Alhambra, the Dome of the Rock, the Mosque of Selim II, the Great Mosque of Isfahan, and the Taj Mahal closely mirrored the original artworks. This success was attributed to student precision in the use of specific architectural vocabulary and

detailed descriptions of spatial elements and structures. For example, in **Figure 1**, the use of the term 'citadel' and detailed description of the Alhambra's palaces and courtyards resulted in an AI image closely resembling the original. Similarly, the descriptions for the Mosque of Selim II, incorporating terms like 'minarets' and 'squinches', yielded accurate AI representations (**Figure 2**).

Figure 1. AI-generated student work illustrating the Alhambra.
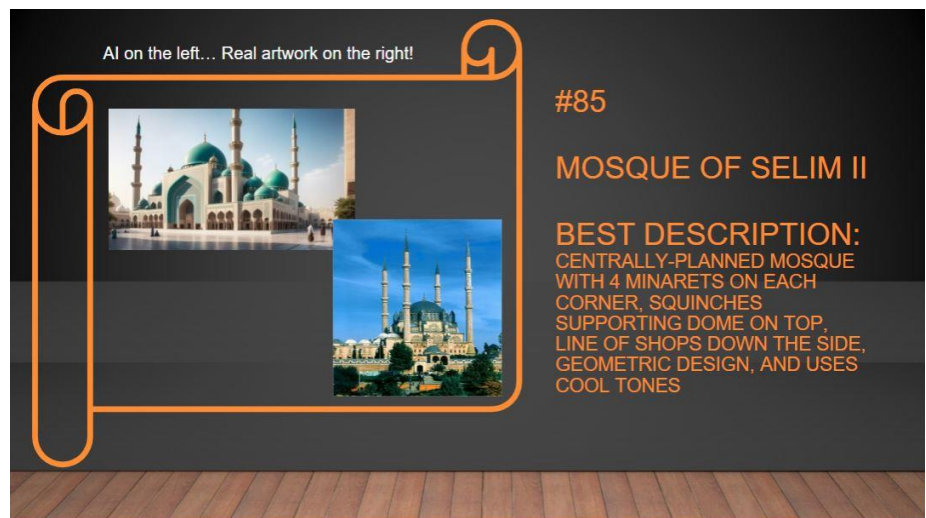

Figure 2. AI-generated student work illustrating the Mosque of Selim II.

In contrast, students encountered difficulties in accurately describing two-dimensional paper narrative works. Instances such as **Figure 3**, an attempt to describe a folio from the Shahnama, resulted in an AI image that significantly diverged from the original, lacking specificity in color and narrative detail. Similarly, **Figure 4**, describing Bahram Gur Fights the Karg, focused too narrowly on one aspect of the narrative, resulting in an incomplete representation. Additionally, students faced constraints due to the limited number of free attempts on the AI website. This limitation became apparent when students realized the need for revising their initial descriptions to achieve more accurate images. The desire for additional attempts to refine their descriptions was a common theme among participants.

Figure 3. AI-generated student work illustrating the Court of Gayumars.

Figure 4. AI-generated student work illustrating Bahram Gur Fights the Karg.

Some instances showcased well-thought-out descriptions that, unfortunately, did not yield accurate AI-generated images. For example, **Figure 5**, despite using appropriate terms like 'kufic' and 'parchment', resulted in an image that did not fully capture the described content. These outcomes indicate a disconnect between the input descriptions and the interpretation on the part of generative AI tools, highlighting the need for more precise framing in descriptions. In all, the results underscore the potential of AI tools in enhancing student understanding and descriptive skills in art history, particularly in architectural works. However, the challenges in accurately describing narrative artworks and the limitations of AI interpretation suggest areas for improvement in both AI technology and pedagogical approaches. The findings offer valuable insights into the integration of AI in art history education and its implications for teaching formal analysis.

Figure 5. AI-generated student work illustrating Folio from the Qur'an.

These results can be understood in the context of research on teaching formal analysis in art history, underscoring the complexity and multidimensionality of engaging students with visual art. Studies such as those by Gasper-Hulvat [13] have highlighted the foundational role of formal analysis in developing critical thinking and visual literacy among art history students. This approach necessitates a deep engagement with artworks, encouraging students to articulate their observations and interpretations using a specialized vocabulary. Locher et al. [19] examined how formal art training influences the perception and aesthetic judgment of art compositions, suggesting that such training deepens the analysis of compositional elements and enriches aesthetic evaluations. Furthermore, the use of digital tools, including AI art generators, introduces new dimensions to this pedagogical approach. Mazzone and Elgammal [22] explored the potential of AI in art making and education, arguing that technology can significantly enhance student understanding and application of formal analysis. The integration of AI tools in art history education, as examined by Dehouche and Dehouche [23], opens up innovative avenues for teaching and learning, allowing students to experiment with and understand art historical concepts through digital creation. Collectively, these studies and theoretical frameworks contribute to a broader understanding of the pedagogical strategies effective in teaching formal analysis in art history, highlighting the potential of integrating traditional methods with new technologies to enhance educational outcomes.

5. Recommendations

The AI image-generation activity proved to be both enjoyable and educational for the students. It effectively highlighted areas for improvement in their ability to provide accurate visual descriptions of artworks. Successful students adhered closely to the instructions, effectively employed vocabulary learned in class, and provided comprehensive descriptions of the entire artwork or structure. Conversely, students who were less successful tended to omit crucial narrative details, did not fully utilize relevant vocabulary, or failed to provide expansive descriptions regarding colors,

composition, and character or shape descriptions. The assignments were evaluated using a rubric on a scale from 5 to 0 across four categories: description of the artwork, AI-generated image, accurate use of vocabulary, and effort/presentation.

Given the insights gained from this exercise, a potential enhancement to further develop student descriptive skills could involve integrating a Free Response Question (FRQ) from a previous AP exam. For instance, an FRQ focusing on the Great Mosque of Cordoba, a notable Umayyad construction, could be employed. Students would initially respond to this FRQ without additional specific instructions. After completing the AI activity, they would be asked to rewrite their response to the same FRQ. The primary aim of this revised task would be to encourage students to critically evaluate their initial responses and identify areas lacking in visual evidence. The secondary attempt would focus on incorporating improvements and additional details in their descriptions. This process would prompt students to reflect on their progression and the impact of the AI assignment on their ability to include detailed visual evidence as required by the FRQs of the AP exam.

This proposed methodology aims to solidify student understanding and application of visual evidence in art historical analysis. By directly comparing their initial and revised FRQ responses, students can concretely see their growth in articulating visual details. This approach not only reinforces the skills practiced in the AI activity but also prepares them for the types of analytical writing expected in AP exams. Incorporating these adjustments into future iterations of the course could significantly enhance student abilities to analyze and describe art. This method aligns with the goals of AP Art History, fostering a deeper understanding and appreciation of art through detailed observation and analysis. Furthermore, it provides an innovative way to integrate technology in art history education, engaging students in a manner that resonates with their digital literacy and learning preferences.

6. Conclusion

The integration of AI tools in AP Art History education addresses a crucial pedagogical need: enhancing student ability to provide accurate visual descriptions and evidence in analyzing artworks. This study was necessitated by the observation that while students enter AP Art History with high academic expectations, they often struggle with the nuanced skill of visually describing art, particularly when devoid of contextual identifiers like title, era, or artist. As such, the study here employed an innovative methodology, utilizing AI image-generation tools to challenge students in describing artworks from the Islamic chapter of their curriculum. Students were tasked with generating AI images that closely resembled specific Islamic artworks without using direct identifiers. This exercise aimed to deepen their understanding and application of formal analysis skills, focusing on comprehensive and accurate visual descriptions.

The results were revealing: students demonstrated notable proficiency in describing architectural artworks, as evidenced by the AI-generated images closely resembling the original structures. However, challenges emerged in accurately depicting two-dimensional narrative artworks, with students often omitting crucial narrative or compositional details. The evaluation of these assignments, based on a

detailed rubric, underscored the variance in student abilities to visually articulate and analyze artworks. Future research in this domain could expand on the current methodology by incorporating additional tasks, such as responding to Free Response Questions (FRQs) from past AP exams. This approach would enable a comparative analysis of student descriptive skills before and after engaging with the AI activity, providing a more comprehensive understanding of their learning progression. Additionally, further studies could explore the integration of AI tools in other areas of art history education, examining their efficacy across various art styles and historical periods. Moreover, this study contributes to the evolving field of art history education, particularly in the context of digital integration and technological advancements. The findings suggest that while AI tools offer significant potential in enhancing visual analysis skills, there is a need for continued refinement in both the technology and pedagogical strategies. Ultimately, this research paves the way for innovative teaching methods in art history, aligning traditional analytical skills with modern digital tools, and fostering a more interactive and engaging learning environment for students.

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