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How to use image interpretation scaffolds in history classrooms

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Abstract

Images, particularly photographs, are ubiquitous in history education, offering opportunities for fostering historical reasoning. However, adolescents often engage with images passively and superficially, rather than thoroughly and critically examining them. This article introduces two image interpretation scaffolds – sequenced and flexible – that can support adolescent students in the analysis and interpretation of visual historical sources. Connecting integration of the scaffolds to didactical frameworks, this overview discusses how they can promote active inquiry and critical reasoning. Further, this article shows the complementary role of internet search and AI tools (e.g., ChatGPT) in fostering deeper engagement during the analysis and interpretation with the scaffolds. Practical recommendations are provided for history educators to use the sequenced and flexible image interpretation scaffolds effectively, enabling students to view reasoning about and with images not merely as a passive process but as an active inquiry of the past.

Keywords

Image interpretation, image analysis, internet research, historical reasoning, classroom teaching

1. Introduction and aims

In history education images are popular, on average three per lesson are shown (Bernhard, 2017). Used images are photographs, reconstruction drawings, historical images, art works, cartoons, and posters. Among these, photographs are the most used. This aligns with the rise of digital photography, where taking, editing and sharing images online is part of everyday life. Especially adolescents not only produce but inform and communicate through photographs (Külling-Knecht et al., 2024).

Given the prevalence of photographs in adolescents' lives, one would expect that critical analysis and interpretation skills would be emphasized in the history classroom. Uncontextualized or edited images can mislead students, creating distorted perceptions of the past and present (Krammer, 2008). Current AI tools intensify this problem, because they not only allow for image editing but can also generate entirely new images (Spengler, 2024). To counter this, developing competencies of historical reasoning by connecting the past to the present and future through questioning, analyzing, and interpreting sources is one of the major aims of history education (Schreiber et al., 2006; Van Drie & Van Boxtel, 2008).

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However, research shows that critical image analysis and interpretation skills are rarely cultivated in history classrooms: Adolescents often inspect images superficially and struggle to contextualize them (Bernhardt, 2007; Wolfrum & Sauer, 2007). Looking at classroom practices reveals that textbooks and teachers seldomly assign tasks that require a thorough examination of images. Instead, images are often used for illustrative purposes rather than for discussion and contextualization (Bernhardt, 2023). Hence, this may hinder students' active engagement with images and possibly foster cognitive shortcuts leading to confirmation/explanation bias (McCullagh, 2000). These biases occur when individuals rely on perceived or sought-after information that corresponds with their prior experiences and beliefs, limiting their capacity to critically evaluate new perspectives (Wolfrum & Sauer, 2007).

To help students when learning with images, image interpretation scaffolds were developed (Ormond, 2011). Although image interpretation scaffolds can foster adolescents' historical reasoning (Van Loon & Waldis, 2024), their integration into classroom settings requires further discussion. This article aims to explore how to use these scaffolds in history classrooms to engage adolescents actively in critical historical reasoning with images.

2. Image interpretation scaffolds

2.1 Reasoning about and with images

Reasoning historically about and with images is challenging and includes complex processes such as perception, analysis and interpretation (Rouet et al. 1996; Van Loon et al., 2024). Lange (2011) showed that these individual processes overlap and may therefore occur simultaneously. However, to facilitate students' learning with images, these processes can be trained separately with the support of image interpretation scaffolds and might improve the transition from analysis to interpretation (Van Loon & Waldis, 2024).

When reasoning about images students need to critically analyze the source and assess the value and the limits of its information in an objective way, including the recognition of the author's perspective and aims as well as the context in which the source was produced. Image interpretation scaffolds guide students during the analysis, as shown by Van Loon and Waldis (2024). However, the process of critical historical reasoning does not stop with the analysis. A thorough analysis forms the foundation and must inherently aim toward interpretation as its ultimate purpose (Hamman, 2007; Schreiber, 2007).

When reasoning with images students select relevant information from the source to address their research question, constructing explanations that connect the past to the present with justified subjective positions (Van Loon et al., 2024). The benefits of the scaffolds for the interpretation are inconsistent and might depend on the type of image and the information available or found on the internet (Van Loon & Waldis, 2024).

Besides analysis and interpretation, training students' visual skills should be a complementary goal when learning with images and scaffolds (Bernhardt, 2018). Research shows that students often focus on central, striking, or familiar elements, such as faces, while overlooking finer details (Bauer & Schwan, 2018; Labischová, 2018). To address this, students need strategies for identifying image details and understanding overall composition, e.g., by scanning images holistically rather than focusing on specific elements.

2.2 Sequenced and flexible image interpretation scaffold

The most common image interpretation scaffolds in history education are based on guidelines by the art historian Panofsky (1939/2018), who differentiates between three sequential steps (see table 1 from a history textbook, Aeby et al., 2017, p. 104): Pre-iconographical description, iconographical analysis, and iconological interpretation (Hamann, 2012). In Panofsky's scaffold, image description focuses on the denotation (what is shown), and iconographical analysis refers to the connotation (how something is shown, considering cultural conventions). Iconological interpretation addresses the image's broader cultural meaning, including the ideas, beliefs, and feelings of that period (Pfisterer, 2020; Schmidt-Maiwald, 2018). Panofsky's sequenced scaffold has an easily applicable step-by-step structure. This might be why this approach still occupies a prominent position in education (Schmidt-Maiwald, 2018). Through time, Panofsky's scaffold

has been adapted and extended by several authors from history education by maintaining its progressive steps and including didactic questions (Fink, 2023).

Table 1: An example of sequenced image interpretation scaffold

Evaluate an image source in three steps	
1. Describe the picture:	• Note all the people, objects, and symbols depicted in the picture. • How are the people dressed, how are they behaving? • What is in the foreground and what is placed in the background? • Are there people or objects that are in a special light? • What questions do you have when you look at the picture?
2. Explain the content:	• What do you know about the event, the people in the picture, and the artist who created the picture? • When was the picture created? • If symbols are shown, what do they mean? • Where is the picture shown (newspaper, church...), and to whom is it addressed? • Where is the picture shown (newspaper, church...), and to whom is it addressed? • Tip: If you don‘t already have this information, find it out on the internet or in the library.
3. Interpret the picture:	• Now combine the information from the first and second step. • Write down the statement that you wanted to make with this picture. • What is the meaning of the colors in the picture? What feelings should be conveyed? • Are there objects or creatures that represent something? Why did you choose these repesentatives?

To support self-structured image interpretation and critical reasoning, a flexible scaffold was developed. This scaffold is based on guidelines for art historians to inspect and analyze images (Bätschmann, 2009), and has been adapted by Van Loon and Waldis (2024) (see figure 1). The developed flexible scaffold consists of two circles. The inner image circle describes questions as guidelines for visual inspection. The outer context circle suggests questions about information not visible in the image that require further research. With the circular structure, the flexible scaffold aims to give students more autonomy than with the sequenced scaffold: They decide with which questions, and at which circle they start their analysis. Importantly, the flexible scaffold supports critical reasoning by emphasizing the context of the image. It engages students in linking an image to a historical event/phenomenon and its present relevance while prompting critical analysis of trustworthiness and historical accuracy.

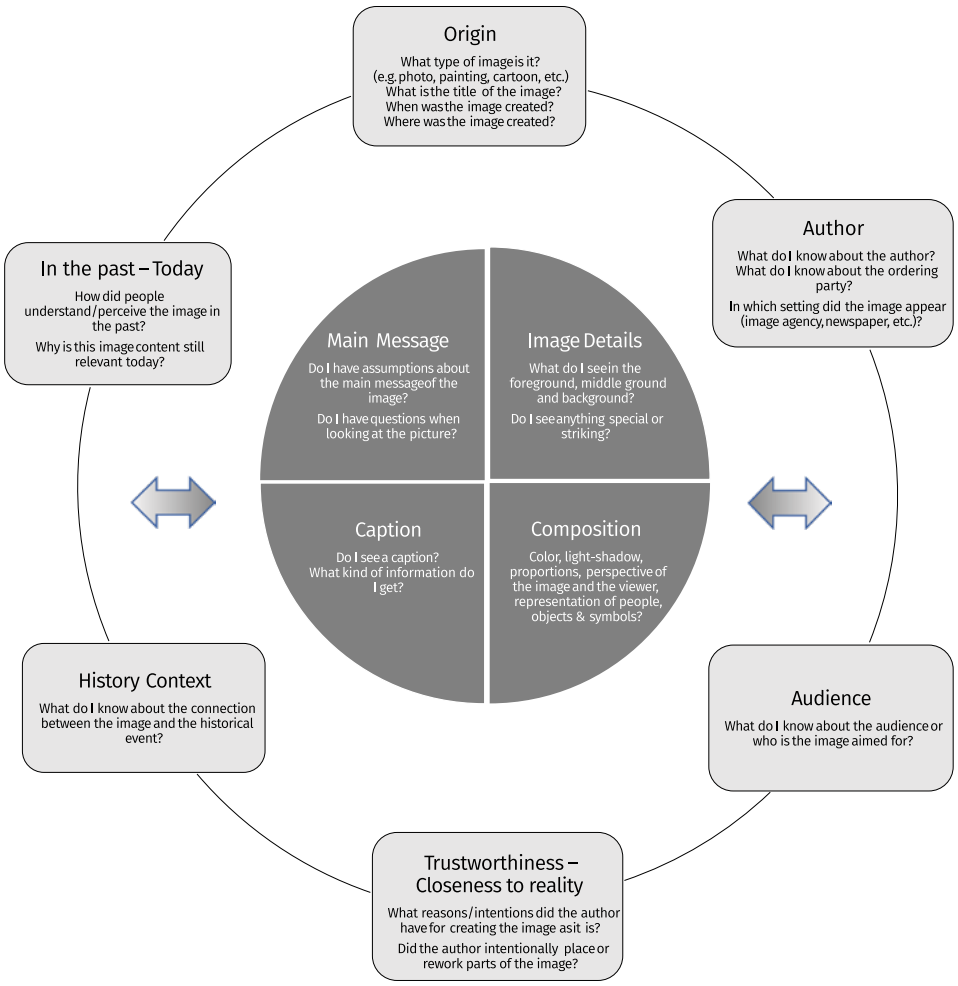

Figure 1: Flexible image interpretation scaffold

When comparing the sequenced and flexible scaffolds, each offers benefits and addresses specific challenges. Van Loon and Waldis (2024) and Van Loon et al. (2025) explored their differences, respective strengths and weaknesses in detail. Instead, this article focuses on examining the didactical framework within which these scaffolds can be effectively utilized for analysis and interpretation in the history classroom. First, general findings on learning with images are presented. Second, possibilities for implementing scaffolds in combination with digital media and historical writing are discussed.

3. Practical applications

3.1 Inquiry learning with images

Inquiry learning (Van Boxtel et al., 2021) engages students in historical reasoning by making them responsible for actively investigating document sets of multiple historical sources. This

approach mirrors historians' disciplinary practice, as students ask questions, analyze sources as evidence, and interpret them with arguments (Monte-Sano & De La Paz, 2012; Van Boxtel et al., 2021). Research suggests it positively impacts historical reasoning, enhancing students' analysis and interpretation of sources (Britt & Aglinskas, 2002; Wiley & Voss, 1999).

The opportunity to combine visual with text sources seems promising for learning, because it can motivate and deepen students' understanding (Mayer, 2005; Prangsma et al., 2008). However, it might also be challenging for learners to use visual and text sources, because they need elaborate competencies including image and text comprehension skills (Van Loon et al., 2024). Thus, the integration of both might be overwhelming and hinder learning, especially for weak learners or students with low prior knowledge (Renkl & Scheiter, 2017). Further, students tend to ignore visual in favor of text information (Van Loon & Waldis, 2024; Wolfrum & Sauer, 2007).

Few studies have used images in document sets, and those mostly illustrate text content rather than serve as independent sources (Van Loon et al., 2024).

3.1.1 Single- and multi-image document sets

Selecting historical images for document sets that prompt inquiry, rather than just illustrate events, is challenging. Simple images may be overlooked; overly complex ones can overwhelm students or lead to misjudgments (Bernhardt, 2006). One solution is using "images within images" (e.g., posters or propaganda) to encourage closer inspection (Van Loon & Waldis, 2024). Captions in teaching materials are often incomplete (Bernhardt, 2017; Kaufmann, 1992), but treating images as primary sources requires including author, type, origin, and format (Bernhardt, 2023). Editing choices, like cropping, should also be noted to avoid misrepresenting historical moments (e.g., the 1972 photo of Kim Phúc by Nick Ut; see Paul, 2005).

To reduce complexity, document sets could include only one primary historical image. Nonetheless, research shows that students struggle to analyze and interpret a single image without supplementary information (Bernhardt, 2023). This can be provided through explanatory texts, for example from history (online) textbooks. Yet in everyday life, adolescents often encounter images without access to contextual information. It is therefore crucial that they learn to critically analyze images and apply these skills independently, even without scaffolds.

Another opportunity to train students' image interpretation skills is the use of document sets with at least two or more images (Sauer, 2000). When using more than one image, the chance that students perceive an image as a "window to the past" can be reduced (Buntz & Erdmann, 2004). Having multiple perspectives of the same event evokes the question of truth and will lead to a closer inspection of the images by identifying similarities and differences. For example, there exist several print graphics showing different perspectives on the beheading of Charles I. of England of 1649 (Kaufmann, 1992, p. 662); or the comparison of election posters with pro and contra arguments. Through investigating these images, students discover that authors' perspectives are shaped by diverse intentions and motivations, revealing a more complex truth than initially assumed (Bergmann, 2016). This shows the power of images, particularly photographs, which can be wielded to manipulate beliefs due to their rapid production and dissemination. While working with document sets containing two or more images appears promising, further research is needed to assess their potential for fostering image interpretation skills.

3.2 Integrating image interpretation scaffolds with digital media

Effective image analysis goes beyond using scaffolds, it also requires an information literacy, especially when engaging with digital media. Both image interpretation scaffolds encourage searching information about the image context. This demands extra information and given that digital media are omnipresent in adolescents' lives, they should be prompted to seek relevant content independently (Scheiter, 2021). Research suggests that internet-based inquiry enhances student motivation, which can foster deeper engagement with images (Mares et al., 2020). However, the ability to navigate the internet successfully depends on an elaborated information literacy. This encompasses not only discovering and understanding information but also critically evaluating its credibility and relevance (Dolničar et al., 2020). Despite its importance, Dolničar et al. (2020) highlight challenges in adolescents' ability to assess the trustworthiness of information, particularly in online searches.

In history education, studies indicate that adolescents rarely evaluate the reliability of either historical sources or online sources such as websites (Van der Eem et al., 2024). This lack of evaluation skills affects their ability to contextualize images accurately, which can lead to

incorrect inferences which hinder a successful interpretation. Therefore, addressing the challenges of source evaluation is crucial for fostering students' information literacy, as it is closely linked to critical thinking and historical reasoning competencies (Luís & Rapanta, 2020; Tirado-Olivares et al., 2023).

Evaluating information is relevant not only in academic settings but also in everyday life. Adolescents frequently encounter information through messengers and social media (Külling-Knecht et al., 2024), where visual content, images and videos, attracts more attention than text and enhances the perceived credibility (Cao et al., 2020; Newman & Schwarz, 2024). Due to these characteristics, images, particularly photographs, are often manipulated or misused to spread disinformation. They can be digitally altered or generated by AI, repurposed in a misleading context, or accompanied by false claims (Cao et al., 2020). Additionally, photographs are often embedded in text-based narratives, requiring critical viewers to analyze not only the image itself and its context but also the accompanying textual information (Newman & Schwarz, 2024).

Given these challenges, image interpretation scaffolds alone may not be sufficient to foster students' critical historical reasoning. Wineburg's (1991) *corroboration* heuristic (comparing the content of the source with other sources) could complement image interpretation scaffolds. For example, by comparing images, as multiple photographs of the same event may be available today or by investigating the relationship between images and the accompanied text (Newman & Schwarz, 2024). Also, the extension of corroboration, the *lateral reading* strategy (cross-referencing internet sources for reliability) by Wineburg and McGrew (2017) can be resourceful when contextualizing the image using the internet.

Van der Eem et al. (2024) suggest that evaluating skills are transferable across contexts, whether evaluating historical sources or internet sources. Future research should explore whether image interpretation skills developed through scaffolds transfer to broader contexts, such as evaluating photographs in everyday digital environments (e.g., social media). If so, history educators should integrate diverse image types from both academic and informal contexts to strengthen students' critical literacy skills. For example, analyzing and interpreting social media images might enhance students' awareness of the necessity for critical reasoning, thereby supporting its transfer to historical images.

The advent of AI and large language models (LLMs) like ChatGPT further underscores the importance of evaluating trustworthiness. ChatGPT's human-like interactions and rapid access to information can lead to overtrust and a lack of critical scrutiny (Lalot & Bertram, 2024; Virvou et al., 2024). Users must be aware that AI tools can generate/perpetuate inaccurate, biased, or false information, known as AI hallucinations, and should therefore develop an understanding of how LLMs function and recognize their limitations (Mondal & Mondal, 2023). Nevertheless, using ChatGPT for image analysis can be beneficial: Instant access to information enhances students' motivation and encourages them to engage in more thorough research and critical examination. This, in turn, could help train adolescents' visual skills when AI is used as a learning assistant. Xie et al. (2021) suggest that AI and chatbots hold promise for educational learning processes. Regarding image analysis, ChatGPT can function as a learning assistant, providing just-in-time feedback and individualized coaching based on an image interpretation scaffold, potentially fostering students' critical thinking (Suriano et al., 2025; Walter, 2024). This could be achieved through interactive student engagement during AI-assisted discussions, prompting learners to ask comprehensive questions and consider different perspectives (Mierwald, 2024). For example, ChatGPT could be utilized in an interactive role-play where the AI takes on the role of a historian guiding the student through an image analysis. A potential prompt for such a role-play could be:

> Hello ChatGPT. We are doing an interactive role-play where I am the student, and you are the historian playing the role of the learning assistant. Together we will analyze the image of *The Louisville Flood* by Margaret Bourke-White based on the uploaded scaffold. You will answer my questions about the image analysis and adapt your responses accordingly, using Socratic questioning to guide me without providing direct solutions. Additionally, please inform me about the sources you reference so I can verify and extend my research. Further, ask only one question at a time and provide feedback if my answers are incomplete or incorrect.

Although this role-play approach with ChatGPT appears promising for well-documented images, AI tools are likely to be less effective for analyzing previously unresearched images. This limitation, together with AI hallucinations risks, highlight the continued need for human critical thinking and historical reasoning skills in image interpretation.

3.3 Consolidating learning through historical writing

History students are rarely assigned writing tasks that promote deep reflection on images (Bernhardt, 2017). Writing helps slow down rushed analysis and supports more thoughtful interpretation. This aligns with the writing-to-learn approach, which sees writing as a problem-solving process that engages students in deep inquiry and can enhance both learning and academic performance (Bangert-Drowns et al., 2004).

Historical writing involves evaluating sources and developing evidence-based arguments through how and why questions, fostering historical reasoning rather than just collecting facts (De la Paz et al., 2017; Van Drie et al., 2015). Research showed that writing has positive effects for the domain of history (Boscolo & Mason, 2001; Voss & Wiley, 1997). Thus, implementing image interpretation scaffolds in combination with writing tasks seems promising: Whilst analyzing an image with an interpretation scaffold, students can make notes on the scaffolds by answering the inherent questions. For the interpretation, students can write their own meaningful essay by including the results of analysis.

AI tools like ChatGPT can further support students' historical writing. Research shows that ChatGPT facilitates and supports writing processes when planning, writing or revising text by correcting sentences/paragraphs or making suggestions for improvement (Imran & Almusharraf, 2023). Additionally, studies by Tirado-Olivares et al. (2023) and Kindenberg (2024) demonstrate that ChatGPT outperformed students in writing argumentative essays, having higher scores in historical reasoning. Nonetheless, historical writing is not about outsourcing work or meaning-making to AI; it requires active and critical engagement with sources to understand the past, and its relevance to the present (De la Paz et al., 2017).

Therefore, history educators should design tasks where AI serves as a supportive tool, helping students structure arguments and refine writing, while ensuring that independent historical reasoning and critical engagement with sources remain central. To preserve originality, students should draft independently before using ChatGPT and treat its output as a revisable draft (Lingard, 2023). They can also instruct ChatGPT to retain their own wording. To further refine and personalize AI-generated responses, students can use incremental prompting, providing multiple, iterative prompts to guide the AI toward more precise or context-specific results. However, this process requires domain-specific knowledge to critically evaluate the output, a skill that students may not yet possess (Lingard, 2023). Thus, guiding students in the responsible, effective use of AI tools in historical writing is a key responsibility for educators (Crawford et al., 2023), as well-used AI can deepen students' historical understanding and writing proficiency (Kindenberg, 2024; Levine et al., 2024).

Overall, especially in interpretation, AI can meaningfully extend image interpretation scaffolds by supporting students' historical writing with images. This allows them to focus more on content, argumentation, and critical thinking rather than being burdened by the cognitive load of writing demands (Avello et al., 2024; Sweller & Chandler, 1994).

4. Conclusion: Image interpretation scaffolds in history classrooms

By integrating scaffolds with digital tools and historical writing, educators can transform how students engage with images. These scaffolds provide a framework for moving beyond surface-level observations, encouraging students to critically analyze and interpret images through structured and active inquiry. Digital resources, such as internet research and AI tools like ChatGPT, can amplify this process by offering immediate access to contextual information, fostering deeper engagement, and supporting critical evaluation of sources.

AI holds potential for enhancing historical writing. Tools like ChatGPT can guide students through the writing process, offering real-time feedback, suggesting improvements, and alleviating cognitive load by assisting with structural and linguistic challenges. This allows learners to focus on the substantive aspects of historical reasoning, such as constructing arguments, evaluating evidence, and connecting the past to the present. By complementing scaffolds with AI, students might not only develop stronger analytical skills but also gain the confidence to articulate their interpretations in more nuanced and reflective ways.

Integrating these approaches shifts image interpretation and historical writing from passive activities to dynamic, inquiry-driven processes. Together, they can foster critical thinking, historical reasoning, and information literacy. Future research should explore how this integration impacts learning outcomes and engagement across diverse educational contexts, ensuring that students are well-equipped to navigate the complexities of history and its images.

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