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Criteria for Evaluating Scientific Posters with Elements of Artificial Intelligence

Abstract: Education benefits greatly from visual learning, as visual memory accounts for a significant portion of brain activity. Visual aids such as posters distill complex data and foster dynamic discussions, making them indispensable in academic presentations. Posters are becoming increasingly popular in the educational environment because they allow complex data to be illustrated concisely and comprehensively. However, artificial intelligence (AI) poses certain challenges in the creation and evaluation of posters, raising concerns about academic integrity and personal contribution. The subject of the study is the criteria and methodological approaches used to assess the quality, originality, and academic integrity of posters produced with the assistance of artificial intelligence tools. The object of the study is the process of creating and evaluating scientific posters within the educational environment, particularly those incorporating elements of artificial intelligence. The study aims to develop a unified set of objective criteria for evaluating scientific posters that include AI-generated elements, ensuring ethical compliance, transparency, and fairness in academic assessment practices. This study examines poster evaluation criteria, considering the role of AI, to ensure fairness and transparency in an academic setting. Clear guidelines and requirements for disclosure of AI use are essential for maintaining ethical standards in poster presentations.

Keywords: education, poster, artificial intelligence, academic integrity.

Abbreviations:

AI is artificial intelligence.

Introduction

Education is not only about searching for new methods and approaches to effective learning, but also about finding effective means of their implementation. Vision and visual memory account for up to two-thirds of brain activity, which emphasizes the importance of visual materials in educational settings (*Osa & Musser, 2004*). The use of visual learning has effectively transformed education, offering significant benefits to students across various academic disciplines. Visual aids, such as diagrams and charts, can enhance comprehension and foster a deeper understanding of complex concepts (*Alabi, 2024*). Visual means are of great importance as they can help students understand the content they are learning (*Salbego et al., 2015*) and concisely illustrate complex and voluminous data. Moreover, such a visual mean of

communications as the poster “can be viewed as a pedagogical tool and as having considerable agency in promoting and enhancing students’ professional communication skills and meta-cognitive capacity” (*Brandt, 2009, p. 108*). During some scientific seminars, nearly half of all presentations are chosen as poster presentations (*European Centre..., n.d.*) and it is no wonder that when presenting their scientific achievements, students increasingly choose infographics to present their scientific projects or discuss the results of scientific research. Artificial intelligence has significantly expanded the creative potential of speakers, approaching the creation of presentations closer to automation, taking into account preferences regarding content. Thus, traditional pedagogical practices face complex challenges, namely, how to evaluate a poster with elements of artificial intelligence in terms of academic integrity and the participant’s personal contribution to its creation. Over-reliance on these tools, risks dulling critical skills and eroding confidence (*Lund et al., 2026*). Accordingly, it is essential to find a solution to this problem, specifically by identifying criteria for evaluating such work since posters have become a noteworthy educational tool in the academic setting.

This study introduces a systematic approach to defining objective evaluation criteria for scientific posters that integrate artificial intelligence tools, a topic largely unexplored in current educational research. The novelty lies in aligning AI-assisted creativity with academic integrity principles, bridging technological innovation and ethical evaluation standards. The author formulates adaptable guidelines for assessing AI-generated contributions, ensuring fairness and transparency in academic poster evaluation.

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The study aims to develop a unified set of objective criteria for evaluating scientific posters that include AI-generated elements, ensuring ethical compliance, transparency, and fairness in academic assessment practices.

To achieve the purpose, the following objectives were defined:

- analyze existing academic and institutional requirements for poster design and evaluation.
- identify the challenges posed by the integration of artificial intelligence in poster creation concerning academic integrity.
- formulate a comprehensive and adaptable framework for evaluating posters that involve AI-generated content.
- propose recommendations for policy development regarding AI use disclosure and the permissible level of AI contribution in educational presentations.

Methods

Any form of communication involves the use of a specific system of signs that provides access to the necessary information and helps establish an emotionally positive connection between participants. In this study, graphic synthesis of a poster is understood as a means of accumulating key ideas and presenting them to a broad audience. Therefore, it is necessary not

only to know the requirements for creating competitive posters, but also to understand the criteria for their objective evaluation. The study aims to analyze the criteria for a good poster and identify assessment criteria relevant to evaluating the use of artificial intelligence in this context. To determine reliable criteria for assessing posters, a comprehensive review of the requirements for posters set forth by conference organizers was conducted, along with an analysis of standardized evaluation systems described in the relevant literature. Based on this review, a single set of objective criteria was formulated for the practical evaluation of posters, ensuring the adaptability of the requirements to the influence of AI tools while maintaining transparency and academic integrity. This methodological approach may facilitate a consistent and fair evaluation of posters across various educational contexts.

Literature Review

Posters are a valuable educational tool that promotes visual learning, engagement, and creativity; however, they require careful preparation and design to establish a psychological connection between communicators and realize their full potential (*Duchin & Sherwood, 1990; Osa & Musser, 2004; Sousa & Clark, 2019*). In the medical education environment, posters are described as communicating messages that are brief, consistent, and interactive, making them particularly useful in educational contexts for engagingly conveying information (*Duchin & Sherwood, 1990*). They can be handy for illustrating a concept or idea, demonstrating a process, differentiating between similar things, or capturing interest and stimulating emotion (*Osa & Musser, 2004*). Furthermore, the appeal of the message in the poster allows the audience to perceive it on multiple levels: sensory, emotional, social, intellectual, and economic (*Tovar Samanez, 1987*). It should also be noted that academic presentation skills can be developed through poster presentations (*Brandt, 2009*). Since posters are part of the educational process, it is clear that this tool should be considered from the perspective of academic integrity. A study focused on issues related to AI and academic integrity emphasizes that, as “AI continues to influence educational ecosystems, it is necessary to critically examine the impact of AI on academic integrity” (*Balalle & Pannilage, 2025, p. 2*). Moreover, tools such as ChatGPT “undoubtedly improve the efficiency of writing and the accuracy of academic content, but they also violate academic integrity” (*Balalle & Pannilage, 2025, p. 10*). Some findings suggest that while participants demonstrate confidence and understand the limitations when using AI tools, there is a gap in training, as most stated the need for training in using the AI tools ethically (*Mokgosi & Semanya, n.d.*). However, the speed at which AI-assisted writing technologies are developing may outpace the creation of institutional academic integrity policies and guidelines for their use. It leads to gray areas, confusion, and insufficient awareness of such tools and may raise ethical concerns, such as plagiarism, academic dishonesty, and the potential for AI to replace human writing (*Tolochko et al., 2023*). Despite the plethora of studies on AI impact on education, remains a lack of comprehensive research examining both the positive and negative effects of AI in education, particularly in the assessment of the poster.

Results and Discussion

Any form of communication involves the use of a specific symbol system that provides access to the necessary information and helps establish an emotional connection between

participants. Weiner et al. (1972) defined communication as necessarily involving a socially shared symbol system, or code, which is symbolic in nature (Weiner et al., 1972). The poster as a medium of communication serves to transmit a message by means of a graphical synthesis (Tovar Samanez, 1987) thus, the combination of semiotic codes from different sign systems on a single poster makes the text multimodal and allows to fill in the gaps that arise when recipients from a different cultural space understand the text. According to Osa and Musser, posters are appropriate because they motivate and inspire students to learn, stimulate interest in the topic and effectively illustrate a concept or skill (Osa & Musser, 2004). The graphic synthesis of a poster accumulates the main ideas, demonstrating them to a large audience, and also may attract the maximum number of participants for discussion. Due to the clear and concise presentation of information, the poster exhibits the integrity of the work, while paying attention to details. Such work appeals to its originality and contrast and forces one to focus on specific information, since the exchange of information is carried out without unnecessary distractions. Presenting the topic in the form of a poster report maximizes the student's creative potential, as it is perceived on an intellectual, sensory, and emotional level. Moreover, posters can be viewed several times and data and graphics on posters are as long as an individual wish. The main requirement for the poster is that it should reveal key ideas at first glance as well as the target group and objective should be defined considering to age, occupation, location, and sex (Tovar Samanez, 1987). The use of basic design elements such as simplicity of composition, attractive color combinations, and spacing between headings creates a presentation mode that is both appealing and enduring. Posters communicate and interact with the viewer thus effective development of an educational poster requires clear content delineation, understanding of the audience's needs, and consideration of the environment or setting where the poster will be displayed (Duchin & Sherwood, 1990).

The main assessment criteria includes clearly defined sections, logical flow of ideas, font type, text use, design, color, language clarity and appropriateness, clear structure with well-defined headings, effective mix of images where the use of diagrams or visual techniques to enhance understanding and guide viewers through the poster (Brandt, 2009; Frost et al., 2023; Sousa & Clark, 2019). Additionally, the poster itself should be well-designed, well-organized, legible, and attractive and present concepts succinctly, grabbing and retaining students' attention and interest (Osa & Musser, 2004). All these points should be considered as they promote effectiveness conveying key information clearly and make content easy to comprehend and memorize. At the same time, it would be reasonable to add points related to academic integrity, as the growth of generative artificial intelligence has begun to undermine academic integrity. According to Himendra Balalle, academic integrity is a critically important component of education in today's rapidly changing academic environment. Academic integrity must be adhered because it reflects the value of the qualifications offered by an educational institution. Honesty, trust, and ethical behavior among students, as well as the management of these factors, are an integral part of the activities of educational institutions. However, with the development of AI, traditional pedagogical practices may face complex challenges and opportunities (Balalle & Pannilage, 2025) as poster creators do not indicate the share of work performed by artificial intelligence.

Thus, the permitted percentage of AI-generated work must be indicated in the guidelines and students must declare whenever AI tools are used for research purposes and cannot exceed an established percentage. As AI tools are generated rapidly, the policies must be updated regularly as new AI tools are developed frequently and should be clearly visible on the website (*Mokgosi & Semanya, n.d.*). We also suggest creating a questionnaire to be completed by all participants in the poster section which may include the questions like *Did you use AI in preparing the poster? What percentage of the work was done using AI? What exactly was done using AI?* Accordingly, if images or conclusions are made by artificial intelligence, they should not be evaluated, or the speaker will receive the minimum score.

Conclusion

Education benefits greatly from the use of visual learning, which significantly improves memorization and engagement in various disciplines. Visual aids facilitate the understanding of complex concepts and help maintain student interest. Posters have become a popular educational tool, especially in academic presentations, as they concisely illustrate large amounts of data and stimulate discussion, while allowing to evaluate participants' original contributions. Posters not only effectively convey key ideas in a visual form, but also contribute to the development of students' professional communication skills and metacognitive abilities, supporting their deeper learning and creativity. However, AI tools challenge traditional pedagogical practices by automating part of the poster creation process, raising concerns about academic integrity. Therefore, it is essential to establish objective criteria for evaluating posters that take into account the role of AI, ensure fairness, transparency, and adherence to academic integrity. Academic institutions should develop policies that clearly define acceptable AI use, require disclosure of AI contributions, and adapt guidelines as AI tools evolve to preserve educational values and integrity. In summary, the development of artificial intelligence requires careful evaluation to ensure a balance between innovation and ethical academic practices.

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