

The scientific poster as an authentic assessment in Medical Microbiology: a student reflection.

El póster científico como evaluación auténtica en Microbiología Médica: una reflexión estudiantil.

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Summary

In Medical Microbiology, learning can be reduced to memorizing names, structures, pathogenicity mechanisms, and treatments. This article presents a collective academic reflection by four students on the creation and presentation of a scientific poster dedicated to the effectiveness of the human papillomavirus (HPV) vaccine in Latin America, within the framework of a One Health conference. No formal effectiveness evaluation or systematic analysis of educational outcomes was conducted. From our perspective, the activity required us to define a problem, select and prioritize evidence, relate microbiological content to immunopathology and public health, and communicate a brief and defensible scientific argument. We also recognized difficulties related to unequal experience in research and critical reading, the tendency to overload the poster, the unequal distribution of work, and anxiety during the presentation. We believe that this task can approximate authentic assessment when accompanied by transparent criteria, progressive submissions, feedback, and individual and group evaluation. These observations represent only the authors' experience and do not demonstrate that the poster is superior to other assessment tools.

Keywords: scientific poster; authentic assessment; scientific communication; medical students.

Abstract

In Medical Microbiology, learning can be reduced to recalling names, structures, pathogenic mechanisms, and treatments. This article presents a collective academic reflection by four students on the development and defense of a scientific poster addressing the effectiveness of human papillomavirus vaccination in Latin America within a One Health poster session. No formal effectiveness evaluation or systematic analysis of educational outcomes was conducted. From our perspective, the activity required us to define a problem, select and prioritize evidence, connect microbiological content with immunopathology and public health, and communicate a concise and defensible scientific argument. We also recognized challenges related to unequal experience in literature searching and critical reading, an initial tendency to overcrowd the poster, uneven workload distribution, and anxiety during the defense. We consider that this task may approximate authentic assessment when supported by transparent criteria, staged submissions, feedback, and

both individual and group appraisal. These reflections represent only the authors' experience and do not demonstrate that posters are superior to other assessment methods.

Keywords: medical microbiology; scientific poster; authentic assessment; scientific communication; medical students.

In the Medicine degree program, Medical Microbiology brings together the names of microorganisms, virulence factors, transmission mechanisms, diagnostic methods, and therapeutic principles. This conceptual framework is necessary, but it can become fragmented into lists that are memorized for a test and then prove difficult to recall when faced with clinical or epidemiological problems. In our course, the scientific poster was proposed as an authentic assessment task aimed at connecting microbiological knowledge, evidence-based research, and scientific communication (1).

Authentic assessment proposes that students apply what they have learned to a contextualized, cognitively challenging task, accompanied by criteria that allow them to judge and improve the quality of their own work (2). International literature notes that its value depends not only on the task resembling professional practice, but also on active student participation, feedback, and opportunities for revision (9,10). From this perspective, the poster ceased to be a decorative piece for us and became a public communication that had to answer specific questions: What is the problem? Why did we choose this evidence? What does it mean? What are its limitations?

This manuscript is defined as a collective academic reflection from the student perspective. Its contribution differs from the previous work by the same group, which described the curricular strategy and its teaching foundations (1): here, we examine how four students experienced the selection of evidence, the construction of the argument, the oral defense, and the tensions of the evaluation. Validated questionnaires were not applied, nor was a systematic analysis performed; therefore, our observations do not demonstrate effectiveness, do not establish causality, and do not necessarily represent other students. Reflective writing can help to review experiences and recognize learning needs, but it requires structure, support, and a prudent interpretation of its scope (11).

Context and construction of reflection

The experience was developed within the Medical Microbiology course, with third-semester medical students, during the academic period of March 2025–April 2026. The four students listed as co-authors participated, creating and presenting a poster on the effectiveness of the human papillomavirus (HPV) vaccine in Latin America. This reflection is limited to that poster and the experience of its authors; it does not represent an entire cohort or other courses. The manuscript was constructed from individual reflections written by the four students and subsequently discussed collectively until a consensus was reached regarding the perceived learning and the challenges described. This process did not constitute systematic qualitative data collection, nor did it include coding, triangulation, or external validation.

Selection and prioritization of evidence

The task consisted of creating and presenting a scientific poster on a problem in Medical Microbiology. The event was structured using the One Health approach, and our topic was the effectiveness of the human papillomavirus (HPV) vaccine in Latin America. This led us to connect the agent, the disease, transmission, host response, diagnosis, epidemiology, and prevention through immunization. From our perspective, the limited space of the poster highlighted a difficulty that conventional exams don't always reveal: distinguishing essential information from

secondary information (1, 5). A scientific poster maintains the logic of academic communication: title, authors and affiliation, introduction or problem statement, method or search strategy when applicable, results or synthesis, conclusions, and references (6, 7). Its brevity is deceptive: summarizing a topic without distorting it requires selecting information and justifying exclusions. In our experience, choosing a figure, a table, or a phrase involved deciding what evidence supported the argument, whereas the literature indicates that the scientific quality of the poster does not depend on accumulating text or visual resources (5, 7).

Critical judgment of the evidence

The first challenge we identified was moving from a quick search to a justifiable selection of sources. Finding information about a microorganism was relatively simple; deciding whether a source was current, relevant, and sufficient proved more complex. During the process, we recognized that a statement about diagnosis, resistance, or vaccination does not gain validity simply by appearing in a prestigious journal or having a catchy title. We also noted that every figure requires context, population, method, and source, and that visual clarity should follow scientific rigor, not replace it (5, 8). The topic of human papillomavirus vaccination also forced us to integrate biological mechanisms with vaccination coverage, regional inequalities, prevention policies, and risk communication. This breadth showed that synthesizing evidence is not about gathering isolated data points, but about distinguishing between mechanisms, associations, and causal inferences, and about recognizing the limitations of the sources used. This is an interpretation arising from our experience and not an objective measurement of the development of critical thinking.

Communication, defense, and tensions of experience

The presentation transformed a static product into a form of communication subject to questioning. Simply reading the content wasn't enough: we had to adapt our explanations, manage our time, and respond openly, without concealing our uncertainty. This experience allowed us to recognize that the soundness of the content and the way the message is organized for an audience are inseparable dimensions of scientific communication (6, 8). Defending the poster allowed us to discern the difference between participating in its design and mastering the subject. When a question deviated from the script, connections we hadn't yet grasped became apparent. We interpreted this discomfort as an opportunity for immediate feedback, one of the components that can strengthen an authentic assessment task, although this observation doesn't constitute evidence that the activity itself produced deep learning (2, 9).

Another tension was understanding what made the poster scientific. Aesthetics could be too time-consuming, a striking template could mask a weak question, and an abundance of icons did not correct an inadequate font (5). Group evaluation could also obscure unequal contributions. Therefore, we considered it relevant to assess the process, the justification of decisions, and the individual response to questions, in addition to the collective product. Progressive submissions, mentoring, and feedback offered opportunities for self-assessment and peer assessment, but their effect was not formally measured (1, 6, 7).

Scope as authentic assessment

From our perspective, the poster approximated an authentic task because it placed us in a recognizable role within the scientific community: selecting evidence, communicating it to an audience, and being accountable for our decisions. We identified realism in the simulation of scientific communication; cognitive challenge in the need to analyze and synthesize; and evaluative judgment in comparing the product with criteria, receiving feedback, and revising it (2,9).

However, authenticity does not reside in the format alone: it depends on the alignment between purpose, criteria, support, and evaluation of the process.

The poster alone does not demonstrate clinical competence or deep learning. In Miller's pyramid, its creation and presentation can provide contextualized evidence close to the "shows how" level when the student explains and justifies decisions; they do not demonstrate the "does" level, which corresponds to performance in real-world practice (12). Therefore, the poster can complement the assessment of comprehension, communication, and reasoning, but it does not replace the observation of procedures, laboratory work, case resolution, or individual knowledge assessment. Its main limitation arises when it is used as the sole evidence or when the grading prioritizes graphic design over scientific quality (5,8).

Conclusions

- Creating and presenting the poster changed how we engage with the content of Medical Microbiology. Instead of simply reproducing information, we had to organize, justify, and communicate it effectively. We realized that the most valuable learning wasn't mastering a design tool, but rather recognizing that clarity requires understanding and selecting evidence, and acknowledging its limitations. This interpretation is solely the authors' and does not allow us to attribute general educational benefits to the strategy.
- Active learning can replicate traditional problems if it lacks guidance: unequal distribution of work, excessive focus on grading, or prioritizing form over content. Therefore, we do not propose the poster as a universal solution; we consider it a potentially formative experience when integrated with other assessments, using transparent criteria, incorporating feedback, and combining group and individual evaluation.

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Ethical considerations: The poster session was a planned educational activity included in the syllabus and academic plan for the Medical Microbiology course. It did not constitute a research protocol, nor did it involve the recruitment of participants or the collection of personal data or educational outcomes for research purposes. The article simply recounts the authors' own student experience in promoting scientific research; therefore, it did not require additional ethical approvals.

Conflicts of interest: The authors declare no conflicts of interest.

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