

NotebookLM as an emerging tool in university education in health sciences

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Dear Editor:

In the current context of digital transformation in the health sciences, it is essential to reflect on the role of multimodal generative artificial intelligence (AI) tools within the university setting. These emerging technologies hold significant potential to transform teaching, learning, and research processes in higher health education, thereby warranting broader academic discussion that transcends specific institutional contexts.

Among these tools, NotebookLM—developed by Google—stands out for its multimodal capabilities, which allow users to upload, analyze, summarize, and formulate questions based on documents in diverse formats such as text, PDF, audio, and video. Its functions include the development of personalized study guides, automated summaries in both audio and text formats, contextual responses, and podcast-style educational audio content generation—now also available in Spanish and in over 50 languages. These features provide concrete solutions to one of the main challenges in health sciences education: the overload of technical and specialized information faced by students and trainees.

From a pedagogical perspective, this type of tool may offer benefits to different stakeholders in the educational process. For students, it facilitates self-directed learning by synthesizing and reorganizing complex content. For instance, those preparing for clinical assessments, seminars, or case discussions often face the simultaneous review of scientific articles, clinical guidelines, and recorded lectures, which hinders the development of an integrated understanding of the material. In this context, multimodal generative AI tools enable the organization and synthesis of information from multiple sources and formats, thereby promoting autonomous learning and evidence-based academic preparation.

Similarly, for faculty members, these tools provide support in the creation of innovative educational materials, the design of more interactive learning experiences, and the adaptation of complex content. Furthermore, for re-

Received: October 24, 2025

Accepted: January 26, 2026

Online: March 27, 2026



Open access article

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Cite as:

Saravia-Rojas MÁ, Camarena-Fonseca AR. NotebookLM as an emerging tool in university education in health sciences. 2026;36(1):e7230. doi:10.20453/reh.v36i1.7230

searchers, these tools may optimize processes such as literature review, comparison of scientific literature, and preliminary structuring of hypotheses in a more efficient manner.

Unlike other generative AI tools, NotebookLM operates on a user-defined closed corpus, generating responses exclusively based on the documents provided, thereby enhancing information traceability. However, given that its educational application remains emergent, it is necessary to evaluate its impact through local studies to guide its integration into health sciences educational processes.

The available evidence supports these applications. Claman and Sezgin (1) report that language models and multimodal generative AI promote more personalized and efficient learning in dental education. Acosta et al. (2) indicate that these tools enable the dynamic analysis of complex clinical data, which is relevant in both teaching and biomedical research. Yamamoto et al. (3) demonstrated their usefulness in strengthening practical skills through clinical simulations, whereas Yeo et al. (4) describe NotebookLM as promising tool for supporting deep comprehension of academic content, particularly among students learning a second language in bilingual education contexts. Similarly, Rajagopal et al. (5) highlight that multimodal tools integrating AI-generated text, audio, and visualizations facilitate knowledge acquisition among students with different learning styles, including those with auditory or visual processing difficulties.

Nevertheless, despite their potential benefits, it is important to consider the ethical and operational limitations associated with these technologies, such as the protection of sensitive data, validation of the sources used, and the need for faculty training to ensure appropriate pedagogical use. In this regard, it has been noted that tools such as NotebookLM keep uploaded documents private by default and do not use them to train AI models, generating responses anchored to user-provided sources, which facilitates the traceability and verification of information (6). Consequently, their incorporation into higher health education should be addressed progressively, accompanied by impact studies and evaluation frameworks that guide their responsible, contextualized, and curriculum-integrated implementation.

In conclusion, it is essential to maintain active surveillance of the new generative AI models that continue to emerge as strategic tools for strengthening university education. Their responsible and ethical incorporation requires ongoing critical reflection from academia to ensure that these technologies effectively contribute to the development of professional competencies, critical thinking, and comprehensive training in health science.

Authorship contribution:

MASR: conceptualization, writing of the original draft. **ARCF:** visualization, writing - review & editing.

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REFERENCES

1. Claman D, Sezgin E. Artificial Intelligence in dental education: opportunities and challenges of large language models and multimodal foundation models. *JMIR Med Educ*. 2024;10:e52346. doi:[10.2196/52346](https://doi.org/10.2196/52346)
2. Acosta JN, Falcone GJ, Rajpurkar P, et al. Multimodal biomedical AI. *Nat Med*. 2022;28(9):1773-84. doi:[10.1038/s41591-022-01981-2](https://doi.org/10.1038/s41591-022-01981-2)
3. Yamamoto A, Koda M, Ogawa H, et al. Enhancing medical interview skills through AI-simulated patient interactions: nonrandomized controlled trial. *JMIR Med Educ*. 2024;10:e58753. doi:[10.2196/58753](https://doi.org/10.2196/58753)
4. Yeo MA, Moorhouse BL, Wan Y. From academic text to talk-show: deepening engagement and understanding with Google NotebookLM. *TESL-EJ*. 2025;28(4). doi:[10.55593/ej.28112int](https://doi.org/10.55593/ej.28112int)
5. Rajagopal A, Nirmala V, Jebadurai IJ, et al. Design of generative multimodal AI agents to enable persons with learning disability. In: *Companion Publication of the 25th International Conference on Multimodal Interaction (ICMI '23 Companion)*. New York: Association for Computing Machinery; 2023. pp. 259-71. doi:[10.1145/3610661.3617514](https://doi.org/10.1145/3610661.3617514)
6. Google Workspace. NotebookLM: Privacy and data use [Internet]. Mountain View (CA): Google LLC; 2024 [citado el 13 de enero de 2025]. Disponible en: <https://workspace.google.com/products/notebooklm/>