

**Session title:** A comparative sentiment analysis of human-generated and machine-generated educational content and their differential impact on students' experience and learning

**Session type:** Research paper (20 mins plus questions)

**Main presenter:** Gary F. Fisher, University of Derby

**Co-presenters:** Dean Fido, University of Derby; Paula Shaw, University of Derby

**Session summary:**

What role can generative AI, such as ChatGPT, play in producing academic content that can be taught to students? This session explores the results of a mixed-methods study evaluating the comparative performance of human-generated and AI-generated educational materials. Through a mixture of psycholinguistic analysis of AI- and human-generated teaching content and a quantitative survey of their impact on students, we examine the capabilities and limitations of generative AI as a tool to deliver higher education.

**Session outline:**

The emergence of accessible and user-friendly AI writing software, such as ChatGPT, threatens to be one of the most disruptive technologies within the contemporary higher education sector (Sabzalieva & Valentini, 2023). Much of the discussion concerning this disruptive technology has focused on students' use of such software, and the implications it may have for assessment integrity (DuBose & Marshall, 2023). However, beyond these threats, the proliferation of generative AI also offers an opportunity. As educators strive to maintain high educational standards amid increasing workloads, generative AI tools could be engaged as a tool to support the delivery of high-quality education and offer an opportunity to augment academic capacity (Webb, 2021).

This session presents the outcomes of a comprehensive mixed-methods study designed to address a simple yet far-reaching question: Can generative AI produce teaching and learning content suitable for contemporary higher education students? Moreover, how do AI-generated teaching materials compare to their human-generated counterparts in terms of their impact on student learning outcomes and experiences?

The session begins by outlining the prompt-engineering process employed to instruct ChatGPT to produce an AI-generated equivalent of a piece of human-generated educational content. Subsequently, we present the results of a comparative psycholinguistic analysis (Tausczik & Pennebaker, 2010) of both the human- and AI-generated samples, assessing the emotional sentiment conveyed within each. Finally, we share the findings of a quantitative survey of students (N=361) who were exposed to both samples and evaluate the comparative impact that each had on their learning experience.

Through this rigorous mixed-methods approach, this session demonstrates the capabilities and limitations of ChatGPT as a tool for supporting the generation instructional content. It explores the implications of generative AI for the academic profession and proposes a robust research protocol for further investigation into the field.

**References:**

DuBose, J., & Marshall, D. (2023). AI in academic writing: Tool or invader. *Public Services Quarterly*, 19(2), 125-130.

Sabzalieva, E., & Valentini, A. (2023). ChatGPT and Artificial Intelligence in Higher Education. International Institute for Higher Education in Latin America and the Caribbean. Retrieved from [https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-and-Artificial-Intelligence-in-higher-education-Quick-Start-guide\\_EN\\_FINAL.pdf](https://www.iesalc.unesco.org/wp-content/uploads/2023/04/ChatGPT-and-Artificial-Intelligence-in-higher-education-Quick-Start-guide_EN_FINAL.pdf) [Accessed 10/08/23]

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, 29(1), 24-54. <https://doi.org/10.1177/0261927X09351676>

Webb, M. (2021). Artificial intelligence (AI) in tertiary education. *Jisc*, 26 April (Updated 14 June 2022). Available at: <https://beta.jisc.ac.uk/reports/artificial-intelligence-in-tertiary-education> [Accessed 10/08/23]