

# Exploration of AI-Powered Mixed-Methods Approach as Methodological Literature Reviews

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**Abstract.** Methodological literature reviews often involve challenges like managing large datasets, identifying patterns, and ensuring rigour. Most methodologically based literature reviews focus on either quantitative or qualitative approaches only. The integration of the two approaches with the triangulation of Generative AI tools is still quite recent and requires Human-AI collaboration skills. For example, the Bibliometric analysis (quantitative) allows researchers to map trends and clusters in academic publications, while the framework analysis technique (qualitative) allows researchers to systematically organise, structure, and interpret qualitative data. The Large Language Models (LLMs) such as Gemini and ChatGPT, through chain-of-thought prompting, researchers can perform exploratory analyses on datasets, for example, to identify the first categories. The articulation of these different dimensions requires proposed theoretical models that can be applied in real contexts.

The proposed workshop will engage participants in participatory tasks. We will present on a practical QUAL-quant (qualitative-dominant) mixed-methods approach integrating the bibliometric analysis in the framework analysis technique. The participants will be writing a Chain-of-Thought prompting and use it with tools like Gemini or ChatGPT to explore datasets and full papers that will be shared with participants.

The workshop will allow participants to understand the importance of human-AI collaboration, to triangulate different types of tools and do teamwork tasks. Through hands-on activities and dynamic discussions, participants will leave with actionable insights to integrate AI into their own research.

**Keywords:** Bibliometric analysis, Chain-of-Thought Prompting, Mixed-Methods Research, Generative AI, webQDA.

**Necessary resources:** Access to ChatGPT (preferably GPT-4). Workshop materials will be provided, including sample datasets and practical guides.

## Biographical notes:

**Pablo Burneo** is an educator with a background in engineering and a passion for advancing teaching and learning practices through active learning methodologies. Since 2016, Pablo has been teaching and integrating innovative approaches into his courses, focusing on how active learning, and in recent years, Generative AI, can enhance the teaching-learning process. Although his primary expertise lies in quantitative research, he is keenly interested in exploring how AI can complement active learning strategies to foster deeper student engagement and improve educational outcomes. Pablo has gained



experience in conducting workshops and research, bridging traditional quantitative approaches with emerging AI technologies to create impactful learning experiences.

**Judita Kasperuniene** is an Associate Professor and Senior Researcher at Vytautas Magnus University in Lithuania, where she leads the "Educational Innovation and Change" research group. She also heads the System Analysis Department at the Faculty of Informatics. Passionate about exploring the future of education and technology, Judita's work dives into how innovations like AI, VR, AR, and serious games can shape learning and social interactions. With a strong focus on qualitative research, she is currently delving into the fascinating potential of generative AI in transforming social research methodologies.

**António Pedro Costa** is a principal researcher at the Research Centre on Didactics and Technology in the Education of Trainers (CIDTFF), Department of Education and Psychology of the University of Aveiro (Portugal). He also collaborates with the Artificial Intelligence and Computer Science Laboratory at the University of Porto. He is one of the authors of the qualitative data analysis software webQDA ([www.webqda.net](http://www.webqda.net)). He coordinates two qualitative research conferences ([www.ciaiq.org](http://www.ciaiq.org); [www.wcqr.info](http://www.wcqr.info)) and the AI Education Community ([www.ai-educ.org](http://www.ai-educ.org) – under construction). He is the author of more than 300 publications in international conferences and journals.

