Call for contributions
Special Issue

Title & scope:
Implementing Multimodal Learning Analytics (MMLA) in Ecological Settings for Generating Actionable Insights

This special issue aims to bring together contributions that have used MMLA methods in the wild. Contributions will discuss obstacles to the use of multimodal data in real-world settings, share lessons learned from current projects, and propose productive next steps for the field to become more ecologically relevant.

Guest editors
Bertrand Schneider Harvard University, USA
Roberto Martinez-Maldonado, Monash University, Australia
Gautam Biswas, Vanderbilt University, USA
Marcelo Worsley, Northwestern University, USA

Special issue information:
Learning and Instruction is soliciting submissions for a special issue entitled “Implementing Multimodal Learning Analytics (MMLA) in Ecological Settings for Generating Actionable Insights”.

Aims and contributions
The aim of Multimodal Learning Analytics (MMLA; Blikstein, 2013) is to provide meaningful insights into the learning process by integrating and examining data from multiple dimensions. It seeks to understand how different modalities contribute to learning, how they intersect and influence each other; and helps in designing effective learning environments. It applies various methods and techniques such as machine learning, data mining, and artificial intelligence to process, organize, and interpret complex data. MMLA has substantial implications for personalizing learning experiences, improving teaching methodologies, providing real-time feedback, and promoting successful learning outcomes.

Researchers, however, are recognizing that there is a need for more ecological validity and impact from MMLA: "there is a clear need for further work in the implementation of MMLA systems in authentic spaces where learning occurs (e.g., homes, classrooms, museums), an endeavor that is already acknowledged as challenging (Baker, Ocumpaugh, & Calvo, 2015). It is clear that this line of work has not yet reached its full capacity, and proper in situ setups hold the potential to bridge data quality and ecological validation..." (Cukurova, Giannakos & Martinez-Maldonado, 2020). In a literature review on the scalability
of MMLA, Yan, Zhao, Gasevic and Martinez-Maldonado (2022) found that more than half (51%) studies were conducted in laboratory settings. In a related field (Multimodal Collaboration Analytics, MMCA), Schneider et al. (submitted) have reviewed 147 studies that have used multimodal sensing to capture collaborative processes. They found that only 24 (16%) of them took place in ecological settings.

In short, there is growing evidence that MMLA can be helpful in capturing learning processes in controlled environments; but there is a need to generalize these results to practice. This special issue originates from a symposium organized by the guest editors at the 17th International Conference of the Learning Sciences entitled “Stepping Outside the Ivory Tower: How Can We Implement Multimodal Learning Analytics in Ecological Settings, and Turn Complex Temporal Data Sources into Actionable Insights?” (Schneider, Davis, Martinez-Maldonado, Biswas, Worsley, & Rummel, accepted). Due to the interest in this topic, a special issue on using MMLA in ecological settings seems timely and important.

Scope
As L&I emphasizes the intersection of learning processes and instructional design, this special issue will offer novel perspectives on capturing and interpreting the rich data generated in authentic learning contexts.

- **Relevant topics** include collecting data from wearables or non-intrusive data collection tool in ecological settings; analyzing multimodal data with new methods to generate insights about learning and teaching; leveraging multimodal data in open-ended learning environments, or virtual / mixed reality settings; using the resulting data for providing personalized, formative assessment; powering AI and analytics systems with multimodal data, for example to support teaching, team-based learning or collaborative learning; and more. Finally, we encourage authors to submit not only original research but also meta-analyses, theoretical explorations, instrument development studies, and methodological inquiries.

- **Less suitable contributions** include laboratory-based experiments, pilot studies, proof of concepts, or instrument development without an ecological application

Manuscript submission information:

**Deadline for proposal submission: July 30, 2024**

Interested authors should submit: (a) an abstract of up to 500–1000 words (excluding references and tables), (b) a title page with a short bio of authors (150 words maximum per author), and (c) a cover letter addressing the relevance of the manuscript for the topic of this special issue to the journal’s submission platform (Editorial Manager®) and select the article type “VSI: Implementing Multimodal Learning Analytics”. Abstracts will be reviewed, and selected authors will be invited to submit a full manuscript for consideration for inclusion in the special issue.

**Invitations to submit full manuscripts to selected authors: August 15, 2024**
The Editorial Manager® will be available for receiving submissions to this Special Issue from the invited authors. Please refer to the Guide for Authors to prepare the manuscript and select the article type “VSI: Implementing Multimodal Learning Analytics” when submitting your manuscript online. Both the Guide for Authors and the submission portal can be found on the journal Homepage here: https://www.elsevier.com/journals/learning-and-instruction/0959-4752/guide-for-authors

**Manuscript submission deadline: December 1, 2024**

Submissions will then be reviewed by at least two independent reviewers. Once your manuscript is accepted, it will go into production, and will be simultaneously published in the current regular issue and pulled into the online Special Issue. Articles from this Special Issue will appear in different regular issues of the journal, though they will be clearly marked as Special Issue articles.

**References**


