IMCL Special Session Proposal

Title

Trustworthy and Responsible AI for Inclusive, Sustainable Multimodal Learning Systems (TRAILS)

Acronym

TRAILS

Overview

Generative AI, large language models, intelligent agents, learning analytics, and multimodal interfaces are reshaping education, training, and research. These technologies create new opportunities for personalized feedback, conversational tutoring, adaptive learning, multimodal content creation, AI-assisted assessment, multilingual support, and human-AI collaboration. At the same time, they raise concerns related to trust, fairness, privacy, academic integrity, learner agency, educator roles, institutional governance, and the sustainability of digital learning infrastructures.

This Special Session focuses on the responsible design, implementation, evaluation, and governance of AI-enhanced and multimodal learning systems. It invites research on how Generative AI and related technologies can support meaningful, inclusive, adaptive, and sustainable learning while preserving transparency, accessibility, human judgment, and long-term educational value.

The session directly supports the IMCL2026 theme, "**Artificial Intelligence in Education, Learning and Research**," by connecting technical innovation with educational practice, human-centered design, responsible data use, inclusion, and institutional policy.

Scope and Topics

The Special Session welcomes conceptual, empirical, technical, design-oriented, methodological, and practice-based contributions across higher education, school education, executive education, workplace learning, research training, and lifelong learning.

Topics include, but are not limited to, the following main areas:

- **Generative AI & Adaptive Learning Systems**: LLMs, generative AI tutors, conversational learning companions, intelligent feedback mechanisms, learner modeling, personalized learning pathways, and AI-supported content generation (writing, coding, and research).
- **Multimodal Interaction & Human-AI Collaboration:** Multimodal interfaces (text, speech, image, video, gesture, gaze, biometrics, and sensor data), learner agency, human-in-the-loop systems, and AI-enhanced immersive, smart, multilingual, or cross-cultural environments.
- **Trust, Explainability, & Data Governance**: Explainable AI (XAI) in education, multimodal learning analytics, early-alert systems, educational data mining/standards, privacy-preserving techniques, consent, security, and interoperability.

- **Responsible Assessment & Academic Integrity:** AI-resilient and authentic assessment models, formative feedback automation, authorship verification, transparency in evaluation, and the assessment of higher-order critical thinking.
- **Inclusion, Accessibility, & Equitable Access**: Assistive AI and cross-modal translation (e.g., text-to-sign language, visual descriptions), neurodiversity-aware learning design, algorithmic fairness, bias mitigation in speech/facial recognition, and lightweight, low-resource multimodal models for bridging the digital and global divide.
- **Corporate Training, Business Education, & Workplace Upskilling**: Bias-free multimodal AI tutors for executive education (speech, presentation, and leadership analysis), ethical affective computing and privacy-preserving stress tracking in VR corporate simulations, and trustworthy multimodal systems in Business Analytics, FinTech, and corporate talent development.
- **Policy, Institutional Change, & Sustainability:** Frameworks for compliance with global AI acts and data privacy laws, AI quality assurance, faculty development, green AI (energy-efficient and sustainable AI deployment), climate literacy, and long-term educational/organizational value.

Expected Contribution

This Special Session will contribute to IMCL2026 by creating a focused space for discussing how AI-enhanced and multimodal learning systems can be designed, evaluated, and governed responsibly. It will connect technical advances in AI, multimodal interaction, learning analytics, and adaptive systems with educational concerns related to inclusion, trust, assessment, institutional policy, and sustainability.

The session is expected to support cross-disciplinary exchange among researchers, educators, developers, and policy-oriented scholars. It will also help identify research priorities for the next phase of AI-enhanced education, including trustworthy AI design, authentic assessment, responsible learning analytics, inclusive multimodal interfaces, and sustainable educational infrastructures.

Keywords

Generative AI; Artificial Intelligence in Education; Multimodal Learning; Human-AI Collaboration; Responsible AI; Trustworthy AI; Learning Analytics; Adaptive Learning; Intelligent Tutoring Systems; Inclusive Learning; Academic Integrity; AI-Driven Assessment; Smart Learning Environments; Sustainable Educational Technology.

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