

Understanding New Assessment and Environment for Knowledge Building: Triangulating Features of Discourse Platform, Multimodal Learning Analytics and Text-based Learning Analytics

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This workshop aims to engage participants in discussing and deriving the problem-space surrounding assessment and environment for knowledge building. The problem-space aims to map the types of data (text-based and multimodal data), hypotheses of the learning attributes (visible and invisible) to be derived from these data, and the related annotation and coding specific to the 21st Century Competencies of communication and collaboration skill. The discussion will revolve around different collaborative scenario in a knowledge building classroom, e.g. knowledge building talk, small group discussion with or without computers.

The workshop will first acquaint participants with a number of innovative design of KB environment, as well as text-based and multimodal learning analytics already in progress but the team will also focus on challenges yet to be met. Participants will then work (in groups) on different sets of collaborative scenario to generate possible hypotheses afforded by the multimodal data to surface different learning attributes of students, along with suggested coding and annotation.

Over the years, knowledge building research and innovation have endeavoured to change the teaching landscape, providing theories, models and technology to shift from teacher-centric to student-centric and idea-centric practices. The on-going adoption of knowledge building by schools across different continents is motivated by the need to engage students in knowledge creation practices. Knowledge building is a well-established field in education research, and the advocacy of knowledge building continues to gain momentum. However, it has often been termed as one of the most different learning sciences theory to tackle in practice.

A principled-based solution of multimodal learning analytics (MMLA) that teachers can easily access to support their design of the environment and assess along with feedback mechanism conducive to the enactment idea-centric pedagogy is the critical piece of scaling and sustaining knowledge building practice in schools. Toward this end this half-day design workshop is proposed to inform the design of such MMLA solution. It is essential to continue to explore how advanced digital technologies and LA can mitigate the relationship between epistemic practice and interaction pattern between students in order to reinforce productive collaboration patterns.

The goal of this workshop is to produce a classification table of the problem spaces framed onto a developmental trajectory to distinguish between different types of collaborative practice in school. This problem-space table attempts to explain the following: (i) classroom collaborative practice; (ii) the design features of online discussion forum; and finally (iii) the design and adaptation of text-based and multimodal learning analytics.

More importantly, we hope to brainstorm on a robust feedback mechanism that can be adopted in class through the understanding of the annotation and coding mode in the problem-spaces classification table. Such holistic understanding will be useful in supporting teachers in the facilitation of online and face-to-face knowledge building environment focusing on emerging ideas, leading to a better characterization of teachers' design practice to inform professional development.

The workshop is designed to engage interested participants in exploring these problem spaces and figuring how the implementation of MMLA in authentic classroom settings. Please fill in the survey so that workshop organizers can fine-tune the workshop in line with interests and talents of participants.

The expected outcomes of this workshop will be a draft problem spaces classification table with design features that can be integrated into classroom. We also hope to establish a working groups to continue to advance the objectives set out in these workshop, even after the workshop.

The workshop will proceed in 3 phases.

- Phase 1: Introduction and orientation. The organizers will present an overview of the present state of design and research on knowledge building environment and assessment through multimodal and text-based analytics. The major challenges for these initiatives as research and practice will also be discussed.
- Phase 2: Work, in groups, on unpacking different collaborative scenario, working through the data types, the hypotheses of how these data can inform 21st century collaborative and communication competencies, formulating the problem spaces classification able.
- Phase 3: Group report on discussions, clarify the problem spaces, propose design solutions, and outlines future work needed to consolidate the proposed solution.