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# Using KBDeX to Visualize the Ephemeral Travels of Ideas in a Knowledge Building Community

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Idea improvement is central to Knowledge Building (Scardamalia, 2002). The process of idea improvement can be described as "ideas interacting with ideas to generate new ideas" (Scardamalia & Bereiter, 2006, p. xx). This involves the teacher engaging students in complex socio-cognitive dynamics that promote the transformation of ideas into deeper understanding (Hong & Sullivan, 2009). Thus, examining the travel of ideas in a community is foundational to understanding learning (Saxe et al., 2015), and by extension, Knowledge Building.

This study follows the travel of ideas in idea networks created in Knowledge Forum (Scardamalia, 2017). We build on previous work that used KBDeX (Oshima, Oshima, & Matsuzawa, 2012) to trace the emergence and alignment of key concepts in the community discourse (van den Ende, van Heijst, de Jong, Matszuawa, & Kirschner, 2017) and extend the socio-semantic network analyses to explore the presence of core concept(s) that grounded the community discourse. Our results indicate that as students worked on refining their learning theories, "knowledge" was a core concept that repeatedly emerged to link new ideas with existing ideas. For example, "knowledge" occupied a central position in the idea network during the first 30 turns of discussion, then again between turns 60 to 80, 140 to 180, and 230 to 260. Between turns 10 to 30, "knowledge" was closely associated with "self", "development", "motivation", "autonomy", and "experience. At turn 40, a connection between "knowledge" and "context" was created when students reframed learning as a "change in self- and world reference". At turn 70, "knowledge" was associated with "reflection" and "consciousness" as students reframed learning as a "transformative process". Then at turn 80, students reframed learning as a "social" and "cultural" process. At turn 160, students attempted to put their knowledge together for a theory of learning that included "social interaction", "critical reflection", "change in meaning", "transformative process", and "lifelong learning". It is interesting to note that while "knowledge" and "innovation" both appeared at the beginning of the discourse, they were never connected together until turn 246, when students reframed learning from an individual to a "collective" process. Though students did not explicitly discuss "epistemology", the evolution of their idea network parallel the progression of themes in the course readings: from cognitive to social to cultural perspectives on learning.

Implications of this work are discussed within the context of continuing and professional learning of educators. KBDeX has the potential to make more palpable the dynamics of idea interactions during Knowledge Building. We believe that KBDeX can be used to not only

visualize idea improvement, but also the epistemological evolution of Knowledge Building communities.