Cross-Classroom Interaction: Connecting the "Science Bubbles" of Four Grade 5 Knowledge Building Communities

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The Issue/Problem

In real-world knowledge creation, the trajectory of sustained inquiry and discourse in each community is further supported by interactions across communities that work as an interconnected field. Such cross-community interactions help to sustain productive knowledge building over time across generations, with newcomers learning from the existing ideas, practices, and role models and further making novel contributions. Existing research on knowledge building has focused on student inquiry and discourse in individual classrooms. New advances are needed to support emergent interactions at the higher social levels (Stahl, 2013) to enable cross-community interaction for sustained knowledge building.

Major Goal

This research design aims at testing designs of cross-community knowledge building, which serve the need to enable students' idea sharing and build-on with members from other communities who have similar interests for mutual learning and collective knowledge advances.

How the Research Addresses the Issue/Problem

In this yearlong design-based study, students from four Grade 5 classrooms studied human body systems using Knowledge Forum (Scardamalia & Bereiter, 2006). Drawing upon our prior study (Zhang et al., 2017), we used a multi-layer interaction design to support student knowledge building: As students engaged in focused inquiry and discourse within their own classroom's online space, they reviewed productive threads of ideas generated from their work and created "super note" reflection for cross-classroom sharing. The "super notes" serve as boundary objects (Star, 1989), which focus on synthesizing the unfolding journey of inquiry. Super notes writing is based on a regular KF note but uses four new scaffolds: Our research topic and problem(s)…, We used to think…, now we understand…, We need deeper research… Students posted their Super Notes in a shared public view in Knowledge Forum (Figure 1). Students could also access the Super Notes created by previous years' communities.

Advances

To trace students' cross-classroom interactions, we used the social network analysis software, Ucinet (Borgatti et al, 2002), to illustrate who read whose super notes between the four classrooms. The results show dynamic interactions emerged from the Super Note reading activities. The clustering coefficient is 0.52, suggesting that the network is almost equally centered (Figure 2). Students' frequencies and interactions across the classrooms are shown in Figure 3.

To gauge the quality of student reflective syntheses of journey of thinking in their Super Notes, we conducted content analysis of a total of 56 Super Notes created by the four classrooms. The analysis captured the content topics of the super notes (Figure 3). Additionally, we coded student ideas summarized under "We used to think" and "Now we understand" based on scientific sophistication and epistemic complexity (Zhang, 2007). Ideas summarized under "Now we understand" are found to have a much higher rating in scientific sophistication and epistemic complexity than those summarized under "We used to think," showing the depth of student reflection on idea progress.

Qualitative analysis of classroom discussions and student reflections showed student benefits from the cross-classroom interactions. The Super Notes helped them deepen their research, see relationships between different organs and systems, and generate deeper questions for sustained inquiry.

Next steps

We are conducting deeper analysis of the classroom and online data to examine the quality of the cross-classroom interactions through the super notes and understand how students used information from the Super Notes as they engaged in deeper inquiry in their own classrooms. Based on the findings from this and our prior study, we are creating a cross-community interaction space in Idea Thread Mapper, which works with Knowledge Forum, to support sustained knowledge building across classrooms.

References

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Figures:

Figure 1: Knowledge view for Super Notes sharing between different classrooms

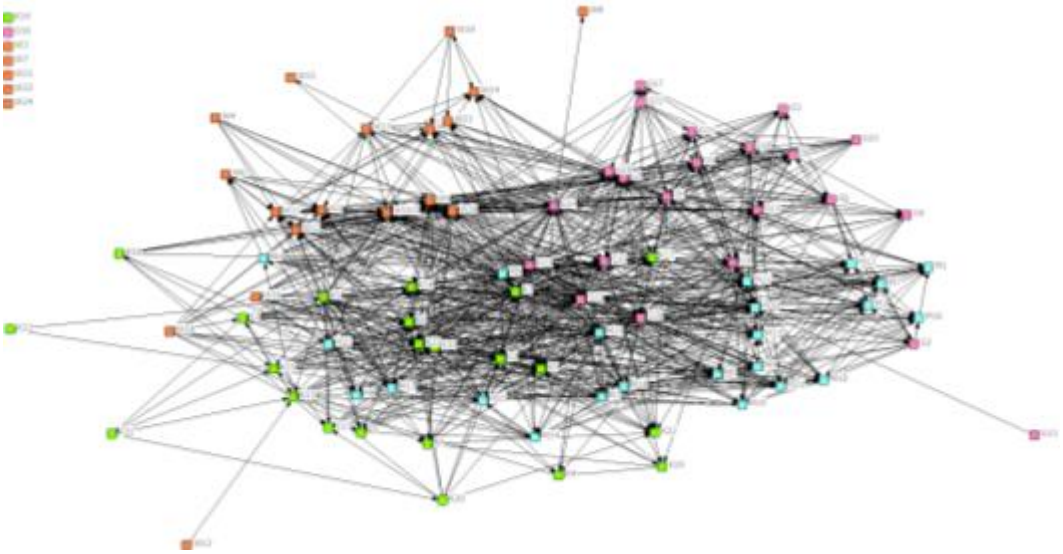

Figure 2: Cross-classroom network of Super Notes reading

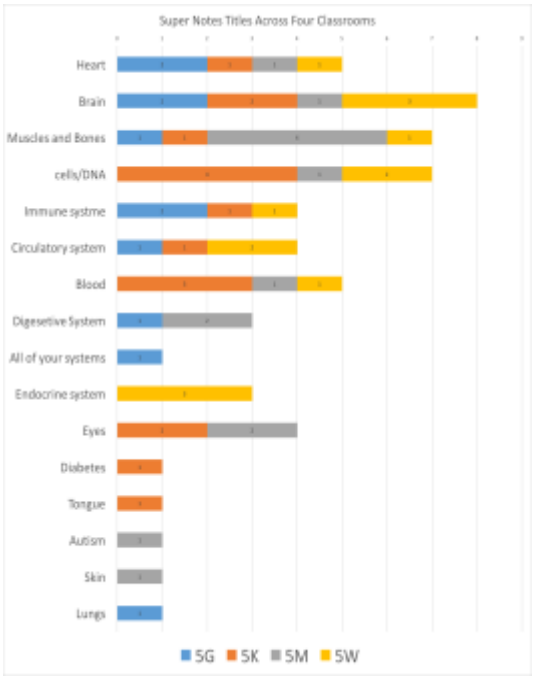

Figure 3: Super Note topic distribution among the four classrooms.

how students collaborate and develop their knowledge overtime.
Wondering area:
Develop their knowledge: epistemic change