Advancing the Horizons of Student Knowledge about Flight:
A Knowledge Building Communities Project

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Overview and Leveraging of Student Voice: This three-phase design study was enacted over the course of two months (8 weeks or 3270 minutes of instructional time) in a grade 5/6 classroom in a medium sized city in eastern Ontario. The content area for this study was narrowly construed as being the Grade 6 Flight curriculum (Ontario, 2007). The teacher and students had never before done knowledge building. The teacher was a veteran teacher of 11 years who had one-to-one chromebooks in his classroom and several iPads available for student use. The class of 30 students included 13 students with special needs, including students on the autism spectrum and several with identified learning disabilities. Student voice was leveraged through interviews held at the beginning and end of the study and through the completion of a survey regarding student sentiment about the relevance of the Knowledge Building (KB) (Scardamalia, 2002) classroom features and their effect on the students' knowledge building work. Students were asked to rank order 14 features from most important (1) to least important (14). These rankings were averaged and clusters were identified. The results are presented below and on the accompanying poster.

Major Goals: The central goals of this study were: (1) to create a classroom design that provides for full participation by all students, basically "a way in for everyone"; (2) to create a sustainable design that is "self-propelled with a reasonable load on the teacher"; and (3) to provide for conceptual gains for all students in the area of flight.

Authentic Problem/Challenge: The challenge was different in each of the three phases of this study. In *Phase I* our problem was to establish the classroom structures or "features" that are typical of a KB community including: A strategy for reading difficult texts; Process for experimentation & model-making; Strategy for personal documentation of progress; A strategy for monitoring classroom activity; Knowledge Forum database use; and KB circle processes. In *Phase II* our focus shifted to the promotion of deeper KB work through (seemingly) continuous sharing of advances stressing the temporary nature of insights along with encouraging students to "play" with ideas (i.e. model-building and experimentation). At the beginning of *Phase III* we noted an imbalance in the level of "playing with ideas" vs "playing with materials" and we therefore put a focus on the production of ideas through traditional Language activities (reading, writing and oral communication) along with the use of KF and KB circle time to explicate and feature focal ideas. Our challenge being to balance playing with ideas and playing with materials.

Promising Practices: Based on the survey and interview data it is clear that 5 features had, from the students' perspective, an important impact on their KB work (Average rankings 4:4 to 5:3): **Choice** of focus; **Hands-on** activities; **KB Circle** time; **Collaboration** with peers; and use of the **KF Database**. We view these features as being those that promote KB discourse, student agency and interaction with others. A second cluster of features (Average rankings 7.1 to 8.2) were those that relate to the accessing of authoritative sources of information and the world of ideas including: **Internet Resources** (i.e. Google & YouTube); **Field Trip(s)** (e.g. Air and Space Museum); **Guest Speaker(s)** (e.g. a local pilot); **KB Notebook**; and **Paper-based Readings** (e.g. books, articles).

Challenges and Next Steps: We note that the features that were rated lowest by the students (Average rankings 9.0 to 12.6) all appear to be related to our attempts to raise the level of accountability and community responsibility in this KB community. These lowest rated features included: **Sharing beyond the classroom** (i.e. with others outside of the classroom); **Teacher launch** at beginning of period (i.e. "please be accountable…"); **Chalkboard sign-up** (to announce to the class the type of work they were doing each period); and **KB News** (a newspaper that was to survey and report on the KB work happening in the classroom and KF database). In the interviews students noted that the KB News ideas should help to promote accountability and that this feature should be improved and implemented in subsequent instantiations of this design for a KB community. Based on the progress of this study we anticipate there is potential in exploring the development of the Global Competencies as a way of supporting the KB approach in schools.

References
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