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Fostering Engagement Through Inquiry-Based Learning

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Fostering Engagement in Inquiry-Based Learning

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Research Question

What is the impact of **inquiry-based learning (IBL)** experiences on **student engagement**?

Literature Review

- As highlighted by Wurdinger et al. (2007), IBL can align with STEM (building bridges) or focus on presenting research (informative posters). In a version of IBL called Genius Hour, students research a passion and create a product (Juliani, 2007).
- The authentic work students complete in these versions of IBL, as well the opportunities for choice and autonomy in research (Genius Hour), have the power to boost overall engagement (Rotgans & Schmidt, 2011).
- IBL builds 21st century skills, including: innovation, problem-solving, collaboration, and communication. Using these skills requires students to be invested in learning, a positive group member, and value overall success in the task.
- Students form a joint-problem-solving-space (JPSS) by being behaviorally and cognitively engaged (Gomoll et al., 2017). By sharing design goals, negotiating authority, and listening to each others' contributions, students progress through IBL in a productive way.
- Although group cohesiveness is central to IBL, students may still be engaged in select parts of the inquiry process, such as writing plans, making the project, or presenting (Wurdinger, et al., 2007).

Methodology

- Participants include 22 fifth graders (10-11 yrs. old). They engaged in 3 categories of IBL: Genius Hour, content area inquiry, and Challenger Learning Center (CLC).
- Field notes, class photos, and work samples document students' reactions to IBL and interactions with others.
- Data was analyzed along the engagement theory of Fredricks, Blumenfeld, and Paris (2004). *Cognitive engagement* refers to investment in learning, *behavioral engagement* involves students' positive conduct with others and activities, and *emotional engagement* is the value attributed to the task, their peers, and overall success.

Figure 1. For Design a Space Alien, 7 of the 8 groups used (optional) craft materials to symbolize their alien's accommodations or their planet's atmosphere. Students similarly valued the benefits extra research could have on their poster, as 6 of the 8 groups used more than required secondary sources (Sullivan & Bers, 2008).

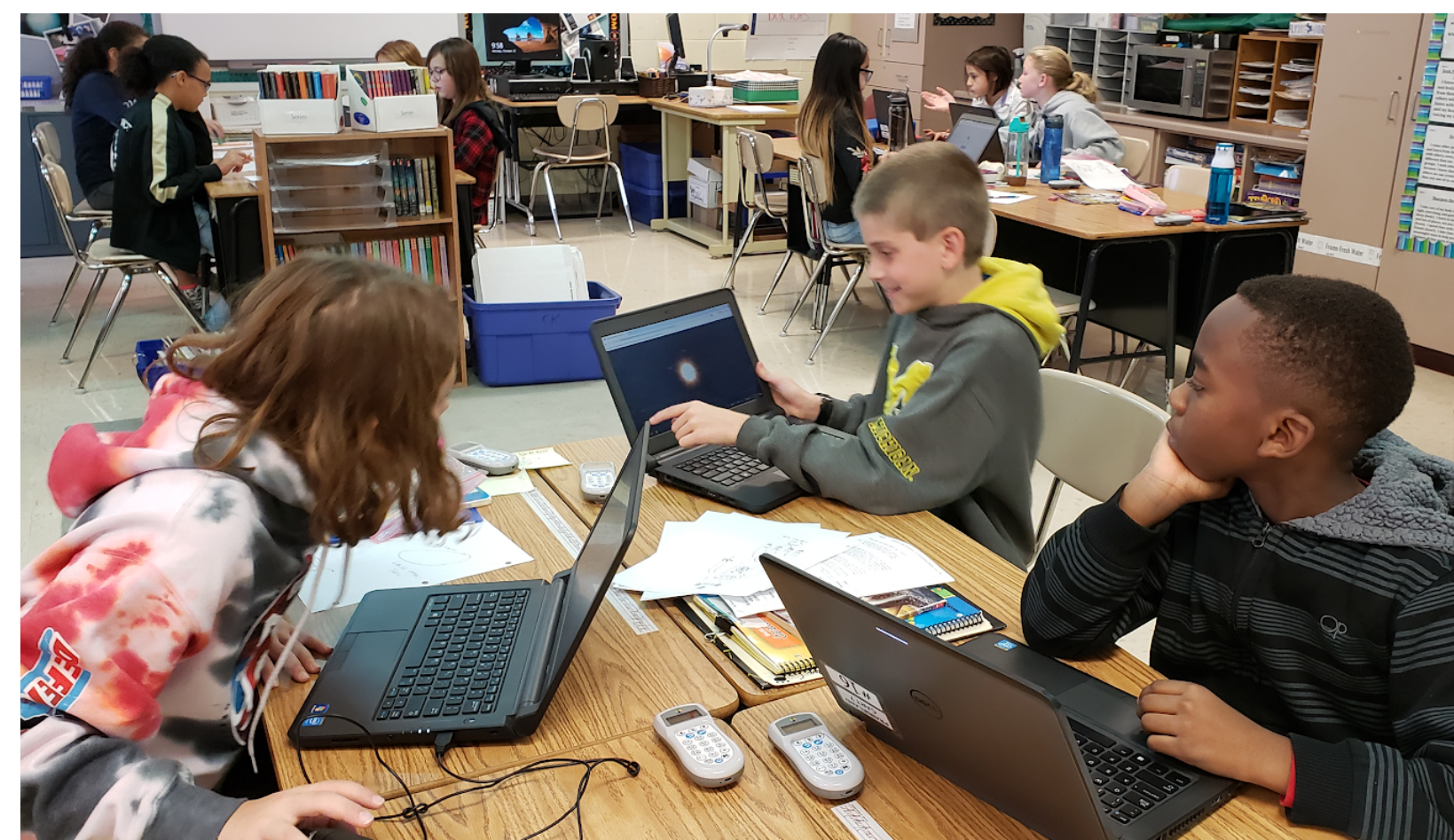


Figure 2. This photo depicts a realized JPSS (Gomoll et al., 2017). Alex uses an embodied gesture (pointing) to highlight a finding, while his attentive teammates turn their bodies towards him. Students' body language and their position of objects (laptops angled towards one another) is supportive of collaboration and discourse, and allowed for the high behavioral engagement of this group.

Results and Data Analysis

- Strong attainment and utility value** during Genius Hour. Emotional engagement is evident in students' research of a past discovery, current hobby, or dream job.
- Emotional engagement encourages **attentiveness and reflection**. Students thoughtfully kept their audience behaviorally engaged during their presentations by posing rhetorical questions, speaking to their peers as equally interested learners, and logically organizing their research.
- The **increased cognitive demand** in content area inquiry and CLC can lower behavioral engagement. Some students struggled to respectfully collaborate and exchange ideas, which led to in-group fighting, the decreased effort and interest of group members uninvolved in the conflict, and an unrealized JPSS. (**Figure 2** presents an exception to this finding).
- Students need **time to learn and practice skills** (i.e. collaboration, communication) needed for self-regulated learning in order to be cognitively engaged. In their CLC self-evaluations, students reported areas of struggle as: reading closely, suppressing distractions, monitoring the quality of their work.
- During content area inquiry and CLC, students were cognitively engaged as **they reflected on prior knowledge or used outside learning** (Love, et al., 2015). Students used analogies to choose accommodations for space aliens and understand new concepts (e.g. acids/bases, line graphs, space probes, aquifers).

Conclusion

- Emotional, behavioral, and cognitive engagement are subject to context and experienced to varying degrees among students. Before implementing an IBL activity, educators should consider what additional supports or practice could facilitate students' future engagement.
- While valuable, CLC is an expensive out-of-classroom IBL experience. Future research is needed to uncover low-cost, and short-term classroom applications of IBL that still provide authentic inquiry opportunities.