Passing the Torch: How Teachers Can Use Teacher-Student Conversation to Progressively Scaffold Inquiry Learning

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Summary: **It's important for teachers to learn how to scaffold task ownership and empowerment for students, particularly in active learning or student-centered classrooms.** In this brief, we describe how one teacher's scaffolding interactions with student groups changed over the course of a problem-based learning unit. We then provide ideas for how teachers can shift their own discourse to empower students within the 5E (engage, explore, explain, elaborate, evaluate) model, or other instructional models, for inquiry in the classroom.

Background: Problem-based learning (PBL) is an instructional approach where students learn by solving problems and reflecting on their experiences.[1] PBL is highly collaborative and complex in nature, which means the teacher plays a critical but non-traditional role, facilitating and scaffolding rather than lecturing or controlling students' work directly. For teachers new to PBL or inquiry learning in general, it can be hard to know how to provide just-in-time help for groups while also building students' ability to take initiative and feel ownership of their work. **Haesol and her colleagues wanted to understand how teachers scaffold student reasoning and articulation of their ideas using subtle shifts in teacher-student conversation during the inquiry process.**

Research Design: This research is an ethnographic study using tenets of conversational analysis. Researchers visited a PBL-focused middle school and filmed one teacher's daily social studies class period for two weeks in a course where students were working on a year-long cross-disciplinary project focused on the question "What do sustainable and resilient food systems look like?" In this sub-unit, students used case studies to define social justice and nonviolence, then used these cases as evidence to understand the role of food industry supply and processing chains in terms of labor movements and social justice. Five hours of classroom interaction, as captured in videos and transcripts of teacher-student interaction, were analyzed using a method that highlights overlapping talk, turn-taking, and the length of pauses in conversation.[2]

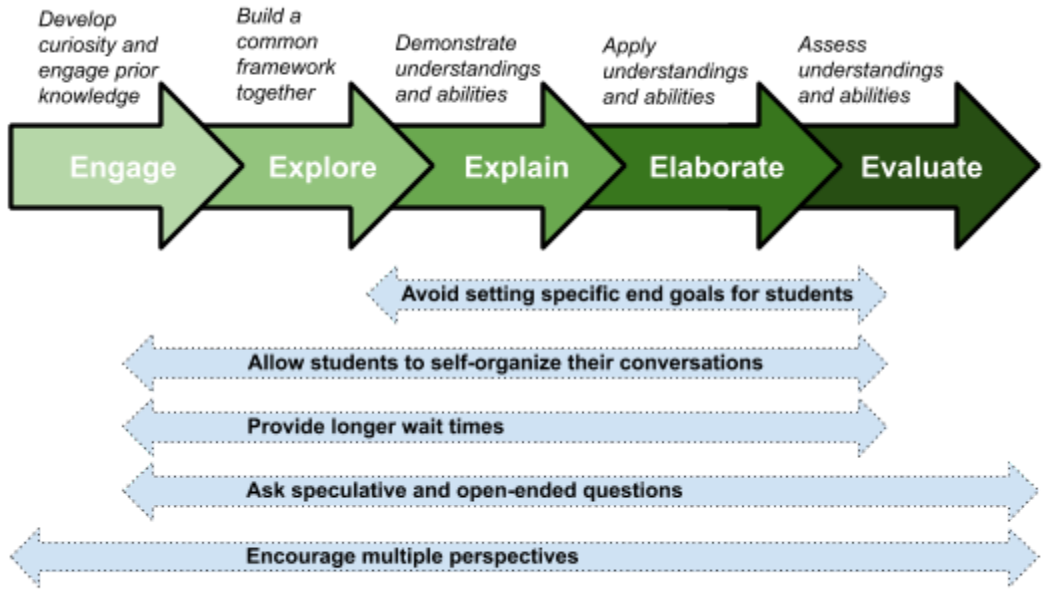
Findings: At the start of this unit, the teacher often provided mini-lectures and selected which students should speak next in discussions. However, as the lessons progressed, four trends emerged from analysis of the lesson transcripts:

1	The teacher shifted away from teacher-led conversation by **allowing students to self-organize their conversations** and take ordinary conversational turns.	2	The teacher **provided longer wait times** before answering student questions, slowing down teacher contribution and pushing students to think further.

[1] Barrows, H. S., & Tamblyn, R. (1980). Problem-based learning: An approach to medical education. New York, NY: Springer.
[2] Jefferson, G. (2004). Glossary of transcript symbols with an introduction. Pragmatics and Beyond New Series, 125, 13-34. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.453.9317&rep=rep1&type=pdf#page=24

3	The teacher shifted from asking factual recall questions to **asking speculative and open-ended questions**.	4	The teacher **encouraged multiple perspectives and avoided setting specific end goals for students**, providing the "wide walls" (multiple ways to approach a task) and "high ceilings" (unlimited potential) suggested by Papert and Resnick.[3]

So what? Teachers: You don't need to be familiar with PBL to be able to apply these findings to your own inquiry-based instruction. One way that science teachers like Kirstin organize and develop their lesson plans is using the 5E model from BSCS Science Learning,[4] which provides a framework for building coherent inquiry-based instruction. We've mapped strategies that were used during the studied lessons onto the 5E model below. **Regardless of what inquiry framework(s) you use, working on any of these strategies can transform the ways students work together and learn in your classroom.**



5E model details summarized from The BSCS 5E Instructional Model: Origins and Effectiveness, Executive Summary, 2006.

Discourse about American education is often informed by district- or state-wide test scores, statistics, and analysis of other large-scale, quantitative data. **That same careful analysis, applied to understanding the types of talk that happen in real-world classrooms, can transform teachers' own understandings of their practice and help researchers and policy-makers understand the deeply interpersonal context in which learning transpires.**

Learn more about the research: Bae, H., Glazewski, K.D., Brush, T., & Kwon, K. (2018, April). Fostering Transfer of Responsibility in the Middle School PBL Classroom: An Investigation of Dialogic Scaffolds. To be presented at American Educational Research Association (AERA) Annual Meeting, New York, NY.

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[3] Resnick, M. (August 25, 2016). Mitchel Resnick: Designing for Wide Walls. *Design.blog.* Retrieved from https://design.blog/2016/08/25/mitchel-resnick-designing-for-wide-walls/

[4] Bybee, R.W, Taylor, J.A., Gardner, A., Van Scotter, P., Westbrook, A., & Landes N. (July, 2006). The BSCS 5E Instructional Model: Origins and Effectiveness, Executive Summary [PDF file]. Retrieved from https://bscs.org/sites/default/files/_media/about/downloads/BSCS_5E_Executive_Summary.pdf