



Collaborative Coaching and Learning in Science (CCLS)

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The NSF-funded Boston Science Partnership (BSP) employs a professional learning community model that they call Collaborative Coaching and Learning in Science (CCLS). CCLS is adapted from a model originally developed for the Boston Public Schools (BPS) to support teaching of literacy. In the CCLS model, a group of 3 to 8 science teachers in a building meet once or twice per week for an 8-16 session cycle. Each group is led by a teacher and supported by an “apprentice facilitator,” both of whom receive training from the BPS Science Department. A full CCLS cycle includes a course of study about science teaching and learning chosen by the participants, research, observations and debriefs, looking at student work, and reflective documentation. Recent topics have include writing in science, using notebooks, assessing student understanding, using evidence to support claims, student misconceptions, and looking at standardized test results. CCLS groups were designed for implementation with much less need for external staff resources than the Boston literacy model from which CCLS was adapted. To accomplish this, BPS Science Department staff members spend much of their time providing specific on-site support to CCLS groups as needed, including co-facilitating and providing quarterly training sessions for teacher facilitators. Some CCLS groups have become independent, self-sustaining communities. Three part-time staff members support 30-35 CCLS groups each year.

Overview of Current CCLS Model		
I. Establish the CCLS Team	II. Engage in the CCLS	III. Learn from the CCLS
Create a culture: <ul style="list-style-type: none"> • Set norms • Develop a common language 	Complete observation cycles <ul style="list-style-type: none"> • Identify protocols • Pre-conference: share lesson plan • Demonstration lesson: observation • Post-conference: debrief with protocol reflection 	Reflect on the CCLS work and accomplishments <ul style="list-style-type: none"> • Revisit the Course of Study • Teacher reflections • Facilitator summary and reflections • Apprentice reflections
Determine the Course of Study		
Establish observation schedules		
Plan for inquiry and Looking at Student Work (LASW) protocol	Inquire: research to inform study	Complete the archive binder



Structure the archive binder	Connect to students: LASW	Share successes and celebrate
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CCLS is an extremely flexible and adaptable model that includes the ability to address a particular mission of the school or district. CCLS has changed the nature of how teachers teach and reflect on teaching and learning science. CCLS does this by providing a context for and culture of on-going, research-informed, in-depth conversations about science teaching and learning. The external evaluation – observations, surveys, interviews of many participants, administrators and district staff – points to changes in teachers’ feelings of their effectiveness in the classroom as well as a change to the overall community of science teachers across Boston. CCLS expands teachers’ knowledge of the science curriculum, advances an atmosphere of professionalism, and raises awareness among teachers and administrators of the roles and resources available from the district’s science department. Teachers also report learning about and implementing new teaching strategies, focusing more on student success and student understanding, and gaining content knowledge. By the spring of 2010, the BSP will have findings related to student outcomes as a function of teacher participation in CCLS; however, the formative evaluations, feedback from participants and informal observations, indicate that there have been important changes to the community of science teachers in Boston. Teachers feel they have support and connections across the district; they are familiar with their peers’ teaching and are known by their peers; they have a structured format in which they talk about teaching and learning in science; teachers at all stages of the professional continuum can participate equally; and there are opportunities for professional growth and recognition through the training and support to take on facilitator and apprentice facilitator roles. Participation in the BSP (CCLS and their other programs) is a statistically significant contributor to teacher retention. CCLS is an incentive to remain in Boston to continue to participate in a vibrant community of practice. A core group of teacher leaders in the district, many of whom were first recruited through CCLS, even formed a monthly science social rotation sponsored by teachers from different schools each month. The socials have continued for two years now, with 50 to 100 science teachers from across the district, as well as STEM faculty and Boston Science Partnership project staff, attending each social. Teachers credit the professional atmospheres of their schools and the cohesive learning communities they have formed with their desire to remain in the school district. This has a direct impact on student achievement, as multiple studies, including one in this school district, have found that higher teacher turnover is clearly associated with poorer student outcomes (Levy, Fields & Jablonski, 2006).

The evaluators also found that there are several characteristics common to successful CCLS groups. These include: 1) support by school administrators, 2) a course of study chosen by the teachers participating in the CCLS group and alignment of that course of study with the school’s mission, 3) a sincere desire by teachers to participate and development of trust among the teachers in a CCLS group, 4) effective facilitation and clear structure in CCLS meetings, 5) authentic feedback offered by peers that includes both praise and challenges with discussions that focus on improving teaching practice, and 6) recognition by participants of connections between the chosen course of study and the lessons observed. Implementation of CCLS has also included challenges that mirror most of the common characteristics.

Three key contextual considerations emerged as the most critical factors necessary for successful implementation of CCLS: 1) at least a minimal level of administrative support; 2) a trained facilitator with the ability to effectively lead a CCLS group; and 3) the prior existence of a moderately well functioning science program in the school. In addition, someone with an understanding of high-quality instruction must be a facilitator or participant in the group in order for high quality and productive conversations to occur. When this is not the case, the BPS Science Department staff members provide additional facilitation assistance. District staff members report that 80% of the CCLS groups for each of the past two years could be deemed “successful.” Success is defined as having key elements of the model in place and in many cases the groups have independent facilitation and are of high quality.

References Cited

Levy, A. J., Fields, E. T., & Jablonski, E. S. (2006). *Overview of Research: What We Know and Don't Know About the Consequences of Science and Math Teacher Turnover*. Paper presented at the NCTAF Symposium on the Scope and Consequences of K-12 Science and Mathematics Teacher Turnover, Racine, WI.