

KNOWLEDGE SEEKERS

NEW YORK PROGRAM CREATES A CULTURE OF INQUIRY
AMONG HIGH SCHOOL TEACHERS AND THEIR STUDENTS



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At its core, inquiry — whether conducted with students or teachers — is a process of making observations, asking questions, working with evidence, and interpreting data. Even though research (Newmann, Marks, & Gamoran, 1996; Scheuermann, Deshler, & Schumaker, 2010) shows well-documented benefits to understanding content, secondary teachers often hesitate to incorporate inquiry for learning.

As professors of education with a deep interest in inquiry learning, we surmised that teachers needed experience using inquiry both as a pedagogical tool and as a learning tool

for themselves. The question was where and how to structure that experience across content areas.

We both had experience with collaborative inquiry, in which teachers, as part of a group, ask a question about their own work, design a study to answer that question, and analyze the data to draw a conclusion, all with support from colleagues. These basic steps outline the inquiry process that we use for both teacher and student learning.

Our insight was this: Teachers can learn a great deal about inquiry from doing it themselves, and this process will not only inform their work with student inquiry, but also develop a culture of inquiry in the classroom.

As a result, we designed a professional development project to support secondary teachers' inquiry into the workings of student inquiry in various content areas.

The Inquiry Learning Collaborative at Pace University recently completed its eighth year. More than 200 high school teachers in New York City and surrounding areas have participated in the project, serving a diverse range of students in various content areas.

THE CORNERSTONES OF INQUIRY

Two qualities are crucial to inquiry: autonomy and authenticity.

Autonomy suggests that the learner should be asking the question,

VISUAL MODEL OF STUDENT INQUIRY					
	Traditional hands-on	Structured	Guided	Student-directed	Student research
Topic	Teacher	Teacher	Teacher	Teacher	Teacher/student
Question	Teacher	Teacher	Teacher	Teacher/student	Student
Materials	Teacher	Teacher	Teacher	Student	Student
Procedures/design	Teacher	Teacher	Teacher/student	Student	Student
Results/analysis	Teacher	Teacher/student	Student	Student	Student
Conclusions	Teacher	Student	Student	Student	Student

Source: Bonnstetter, 1998.

designing the investigation, and drawing the conclusion. To enable teachers to start using inquiry at a spot that is comfortable for them, we use the work of Bonnstetter (1998) to help them see autonomy as a continuum of changing responsibility from teacher to student (see “Visual model of student inquiry” above).

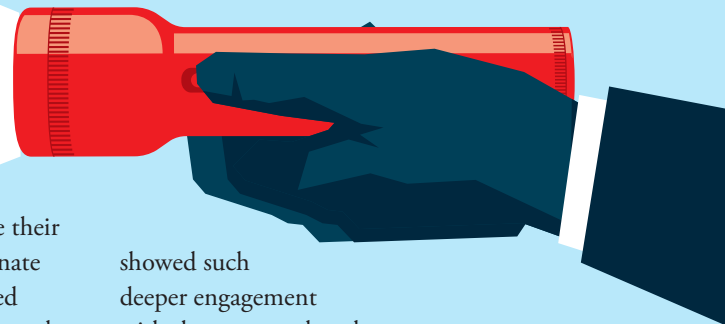
Authenticity suggests that the inquiry should be allied with questions asked by a given discipline. We rely on the work of McDonald and Songer (2008) to help teachers see how authenticity and autonomy intersect along a continuum of development (at right).

We find that teachers are more willing to design for student inquiry when these two qualities are present for them: when they are looking at their own practice (authenticity) and are choosing their own question (autonomy).

For example, one math teacher wanted to understand how she could better help her students see real-world

connections. She began by asking students to write their own word problems that modeled problems in the real world. Ultimately, her inquiry led her students to create their own cities on a Cartesian coordinate plane, providing geometry-backed justifications for planning decisions that would make their city more sustainable. Student surveys revealed the positive impact of this work.

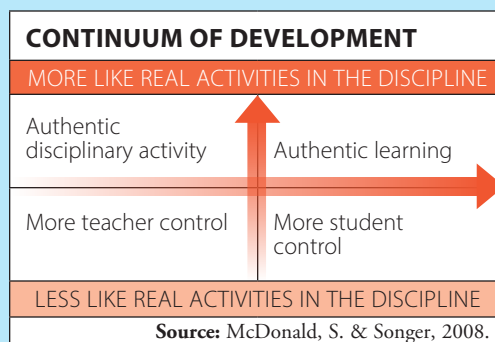
Seeing the value of these qualities for themselves and their students helps teachers conceptualize the value of inquiry for the classroom. Fostering student autonomy while engaging in disciplinary investigations changes the dynamic of the classroom. In the case of the math teacher, her students



showed such deeper engagement with the content that she decided that such projects need to anchor each of her upcoming math units in order to shift the relationship kids were having with math. Inquiry changes the culture of relationships in the classroom — between students and the content, between students

and teacher, and among students themselves.

This culture of inquiry moves beyond the work of a single teacher to a



wider transformation of classrooms, schools, and the university-based professional learning networks of which we are a part. Such systemic approaches are necessary to realize new shifts toward internal accountability, as well as higher expectations for student thinking across the content areas.

Let's now look at the anchoring concepts and core practical structures that will enable inquiry learning for pedagogical and professional learning to transform secondary schooling.

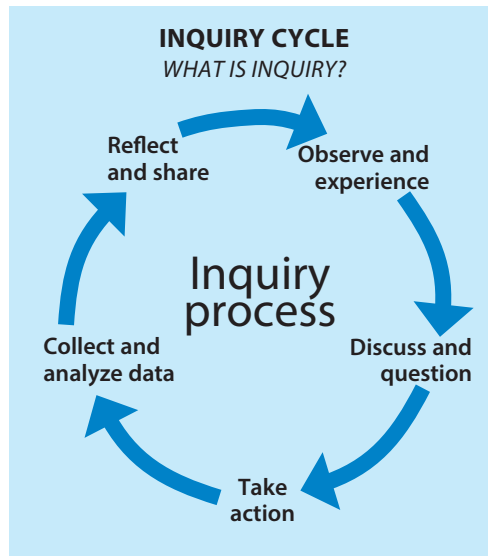
FROM TEACHER INQUIRY TO COLLABORATIVE INQUIRY

Collaboration is necessary to realize an ambitious vision of learning for students and teachers. This model of collaborative inquiry has three crucial characteristics: It's a cycle, a stance, and a public experience.

Collaborative inquiry is a cycle. Whether we're speaking about student or teacher inquiry, we develop the conception with our teachers that inquiry is cyclical and ongoing. We use a simple visual to describe the general process for teachers and their students (see "Inquiry cycle" above). This image shows a process in which answering a question can lead to new and deeper investigations.

For example, one participant started with a question about students writing their own lab procedures. Over time, she grappled with the core issue of autonomy, balancing teacher support with independent investigations, and her question changed to reflect that shift. This process suggests that the end is not really a stopping point but simply a pause before the start of something new.

Collaborative inquiry is a stance. Over time, participants come to discuss their inquiry practice as an ongoing approach to student learning. They move from time-bound, project-based



instruction to a way of thinking about content and interactions with students that promotes inquiry on a daily basis.

Inquiry as a daily practice honors the work on "inquiry stance" by Cochran-Smith and Lytle (2009). This stance recasts the relationship of teachers and students more as partners with each other. As they undertake inquiry, they co-construct knowledge and participate in the larger community of school.

For instance, one group of teachers who were inquiring into how they could support seniors in completing a required senior project found that their high school needed to promote a questioning stance in students much earlier on in their high school careers for them to do well on the project. The democratic impulse of the method demands a deep commitment to using it consistently with all students across all content areas. The method also requires continuous reflection to assess success and improve practice.

Collaborative inquiry is public. Although the work of inquiry may sometimes appear as though it could be done in isolation, our conception necessarily embodies a public component. Enacting a reflective

inquiry stance that is cyclical will not, on its own, bring about the cultural change needed to sustain an individual's inquiry practice.

To sustain the individual, collaborative inquiry must be public. Knowledge must be shared to have a lasting and transformative effect over time for both individuals and the school community. A professional learning community uses public space to create a culture that supports inquiry as both cycle and stance. In this way, the public presentation of teachers' learning helps the larger system, whether a school or a network of schools, to learn (Senge, 1990; Senge et. al, 2000), while solidifying the individual teacher's own learning.

This commitment to collaborative inquiry is grounded in an important need in these times: to create a space where teachers can collaborate, risk, and share what happened in their classrooms. Taking risks and sharing mistakes are crucial to any learning — and especially for learning through inquiry. In our model for professional learning, we designed structures and experiences that encourage risk taking, which we will look at now.

FOUR KEYS TO COLLABORATIVE INQUIRY

Our program has four key structures for professional learning that promote collaborative inquiry: the inquiry plan, the collaborative inquiry group, network events, and co-facilitation. "Inquiry cycle with program structures" on p. 35 shows how the various structures sync with the inquiry cycle.

The Inquiry Plan

The inquiry plan represents a purposeful commitment to take action: to design learning for students that is inquiry-oriented and to assess its

success. The inquiry plan encourages teachers to engage in inquiry practices over time, as opposed to in a single gourmet lesson. (See “Sample abridged learning plan” below.)

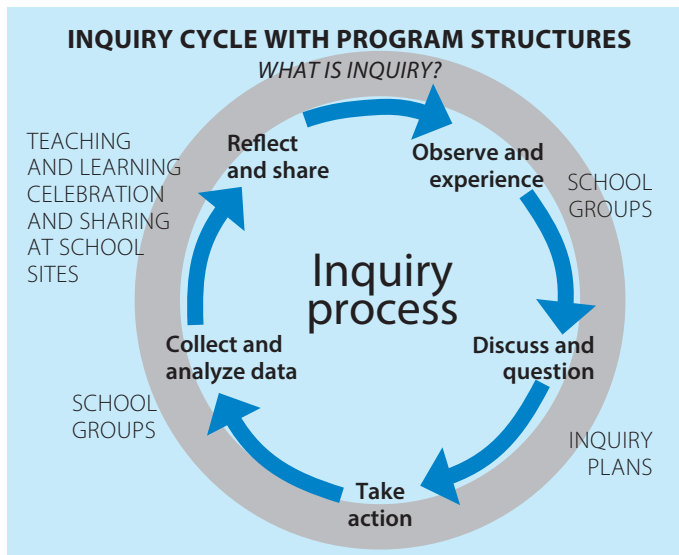
Our intent for the plan is twofold: First, teachers design learning experiences that engage students in using inquiry on a daily basis to meet curricular goals; second, they design an investigation that explores the effect of the inquiry process on students. In the inquiry plan, teachers articulate teacher and student inquiry questions, a plan for instructional intervention, and a way to measure the success of the intervention.

For example, one science teacher framed this question for his students: What conditions are necessary for a self-sustaining system? He wondered whether students could build a self-sustaining biosphere and learn the necessary information on ecosystems, biogeochemical cycles, and sustainability. He used traditional measures such as project assessment, exam grades, and observation of classroom discussion to evaluate whether students had acquired these concepts.

The inquiry plan, then, becomes a written road map to guide the work of the teacher for the year, as well as for us, the teacher educators, in providing development and ongoing support.

Collaborative inquiry groups

Collaborative inquiry groups involve six to 10 teachers from different content areas and grade levels who collaborate at each school to support one another in developing and enacting the inquiry plans over the course of 10 two-hour after-school sessions throughout the year. By



design, collaborative inquiry groups are public places where teacher inquiry of student inquiry is front and center. Facilitated by a university facilitator and a school-based teacher leader, the work of designing, implementing, and analyzing inquiry plans provides a convergence point for collaboration and conversation.

Additional learning opportunities at each session include looking at student work and discussing texts and videos based on the work of others. Usually

there’s a progression over the course of the year from a willingness on the part of teachers to examine lessons generated by others to sharing their own. Over time, teachers develop a stance toward inquiry as an approach to learning, be it student learning in the classroom or their own professional learning.

Network events

Network events bring teachers together from different collaborative inquiry groups for support and challenge. We incorporate two professional development opportunities: a teaching and learning conference and, where funding allows, summer work such as summer institutes, curriculum planning, and, in some cases, support of teachers to prepare their work for presentation and publication.

Network professional days focus on aspects of the inquiry process for students and teachers, such as assessing inquiry, gathering evidence, and specific

SAMPLE ABRIDGED LEARNING PLAN

Title: Promoting critical thinking skills using real-world connections in mathematics.

Description: This project will be geared toward developing teaching practices that promote critical thinking and connections to the real world.

Who: Grade-level 9 algebra students.

Teacher inquiry: If we train students to connect material in the classroom to real-world situations, they will perform better on modeling linear and quadratic equations and on making overall mathematical connections.

Student inquiry: How can I connect and apply the topics I am learning in algebra to real-world situations?

How: First, students will decipher word problems in each unit that connect the material to real-world situations. Next, students will create their own word problems based on a given topic or equation. Finally, students will be presented with decisions they will need to make in the real world, and they will decide what approach to take to make an educated decision.

Data reviewed: In-class assignments, test scores, observations, pre- and post- student surveys, samples of student work at the beginning, middle, and end.

instructional strategies that support inquiry learning. This gathering of teachers enables collaboration across content areas and schools, while deepening connections to the university.

Through these events, we create a larger community of support and feedback, particularly in the culminating teaching and learning conference, where teachers share a variety of insights, such as how to balance the need for scaffolding with the desire to support student autonomy. Others learn new strategies or gain an appreciation for the complexity of questioning. Still others learn that inquiry is not a strategy or a project but a way of being in relation to content that becomes integrated into all aspects of their teaching.

Network events are important because they extract individual teachers and school cohorts from their daily contexts, giving them a chance to pause and focus on classroom practice and connect with others across content areas, schools, experience levels, and interest areas.

Co-facilitation

Teachers change their practice, and eventually their conception of teaching, because of pressures and supports both internal and external to the school and classroom. Co-facilitation capitalizes on this reality by using an arrangement of a university-based facilitator and a school-based facilitator, each providing something unique to the team.

The university facilitator provides an external push on the practice of inquiry. He or she keeps the focus on inquiry, providing outside resources, challenging data, or suggesting moves along the continua. That push is counterbalanced by the co-facilitator's internal pull on keeping the inquiry (and the push) connected to the initiatives of the school. The more idealistic push is grounded by the

realistic pull.

For example, one school began a writing initiative that was very scripted. The teacher co-facilitator identified a need to connect the efforts of this initiative to the inquiry work that had emphasized student ownership of the learning process. The university-based facilitator then engaged the principal, who attended a network day to learn how inquiry could support the school's literacy efforts. In this way, two efforts became a single effort, combining thinking with writing.

By design, co-facilitators together ensure that the work is ongoing, public, and focused on building more than a repertoire of strategies. Active and thoughtful facilitation is crucial to sustaining all the structures in our model that support the inquiry cycle, which is at the heart of a culture of learning.

RESULTS

Is inquiry, which is ongoing, slow, and sometimes indirect, worth it? We think this is a question worth asking because it gets at the purpose of our work to build cultures of inquiry within and across schools.

Engaging teachers and students in inquiry is fundamental to building democratic communities that can address our most pressing problems in the service of ensuring more justice and equity for all members of the community. Not only do we think it's worth it, we have seen evidence that it is.

More than 200 secondary teachers from five urban and suburban schools participated in our professional development model. Evidence from our most recent end-of-year survey shows that, as a result of the program, teachers had a better understanding of student inquiry (87%), had new ideas about how to develop student thinking (87%), and valued school site conversations (97%). In the last year, 90% of reporting teachers said that they

had tried activities or lessons farther along the inquiry continuum than in the past, and 97% said they would continue to develop their knowledge of inquiry. These results have mirrored those occurring in previous years.

As the program designers, facilitators, and researchers, we also noted an improvement in the quality of student and teacher inquiries over time, alongside improved effects on student learning. In the first year of our program, the 2009-10 school year, we evaluated 18% of year-end inquiry results as strong inquiries; by the fourth year, that proportion increased to 56%.

Initially, we saw more inquiries that focused solely on increasing engagement. Inquiry learning was typically used as a hook as a way into content. Over time, teachers designed inquiries that engaged students with the content or particular skills and, ultimately, fostered critical thinking. Inquiry learning was not just a hook for learning; it was the way into and through learning.

Consistent with prior results, 72% of teachers from the seventh year of the program reported student success in learning outcomes, with improved scores on classroom tests, improved standardized test scores, improved classroom engagement, and stronger inquiry practices. As one teacher observed, "It is really amazing to see how much students with well-developed skills from inquiry-based learning are able to advance in their learning and transfer their skills across various topics, compared to other students who struggle with basic skills in organization, reading comprehension, and writing."

Some teachers report that the parallel learning embedded in our model solidifies commitments to inquiry. As one teacher noted, "One of my lasting takeaways from this year is realizing ... that we do inquiry in order

to take profitable risks in the classroom and that ultimately we do that to help our students.”

AN EFFECTIVE ANTIDOTE

These results are most remarkable, given the more open-ended nature of this model and the more narrowed reform context in which it emerged.

On the one hand, the new standards, from the Common Core State Standards to the Next Generation Science Standards, focus more on disciplinary practices and, increasingly, on the higher-level thinking and complex literacy skills required in an information age. These rigorous expectations require that teachers employ a complex repertoire of learning approaches sustained through collaboration and reflection with peers. These standards cannot be realized without shifts in school culture toward inquiry as both a strategy and an outcome for learning.

At the same time, policy approaches for teacher accountability in the last decade have aimed to link student achievement on standardized testing to teaching quality as a key measure. Although rigorous standards project a vision of 21st-century learning consistent with our view of inquiry, the standardized nature of the tests limits the value of the complex thinking and working skills supported by inquiry. As teachers focus more on the outcome of these tests, the accountability reforms can jeopardize the environment for the necessary risk taking that fosters true inquiry.

Our interest in inquiry learning sits at this point of conflict. We see inquiry as an apt response to new and potentially richer expectations for student learning. Simultaneously, we see our work as a way of resisting the prescriptive nature of accountability reforms that narrow the range of what’s possible for true learning.



Inquiry learning projects a vision of teachers and students as active thinkers and doers who ask questions, seek information, and develop thoughtful responses based on deep understandings.

The program structures that support collaborative inquiry are ones that others can replicate — and, indeed, must create — to realize ambitious learning expectations embodied in rigorous, new standards. In doing so, there is a shared accountability for quality between and among students and teachers engaging in complex and rigorous learning.

Supporting teachers to be inquirers improves their ability to work with students in doing inquiry, even as the context complicates it. The process of inquiring is an experiential activity. The ability to help others do it well requires that the teacher has some practice with it.

If we’re going to hold ourselves to the skill set that the new standards demand of our students, learning through inquiry needs to occur in our classrooms. For teachers to possess the commitment and capacity to facilitate such learning, inquiry into their own practice needs to occur. Our model suggests a way to accomplish both objectives simultaneously.

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