

How Does Teacher Collaborative Inquiry Fit into the Larger Education Reform Picture?

George D. Nelson and Carolyn C. Landel
Western Washington University

Introduction

Teacher collaborative inquiry, or at least teacher collaboration, is a hot topic in school improvement today. Like many ideas in education, collaboration is seen by some as the “Silver Bullet” that is going to “fix” the system. We will argue in this brief note that teacher collaborative inquiry is a necessary element, among many, present in schools that are successfully increasing student learning. We will first define just what we mean by teacher collaborative inquiry, then provide some evidence for its importance and finally, discuss its role in successful school improvement supported with two examples from our work with teachers and schools in northwest Washington. Our discussion will focus around improving science teaching and learning, but we suspect that it is also relevant and valid for other disciplines.

What is Teacher Collaborative Inquiry?

It is important to agree on what we mean by a phrase like teacher collaborative inquiry. There are many models out there in the schools and on the professional development circuit including Lesson Study, Professional Learning Communities, and Critical Friends. Certainly, it is something done by teachers, but not exclusively by teachers. Scientists, science educators, professional development providers, building administrators, and students all may participate and contribute. Teaching depends on more than just teachers since the context within which they teach is critical and many individuals and outside factors contribute to that context. Therefore, limiting teacher collaborative inquiry to only actions taken by teachers overly constrains the definition. Teachers are necessary participants, but others play important supporting roles.

Collaborative implies people working together, with more than one teacher involved. It is possible for individual teachers to engage in inquiry around their practice which we usually call action research. The idea of the added value of collaboration in improving student achievement is pervasive in education circles today (DuFour and Eaker, 1998) and is supported somewhat by the research (Feger and Aruda, 2008, Goddard, Goddard & Tschannen-Moran, 2007). It makes sense for at least three reasons. First, engaging more people focuses more minds on the questions at hand, pools the collective knowledge and wisdom, and offers support for each individual. Inquiries are more likely to be completed or sustained if there are multiple players, learning from each other, and each with a stake in the outcomes. Second, the value added studies show that students who experience effective teaching over multiple years are much more likely to be successful than students who randomly experience both effective and ineffective classrooms (Sanders, 1996), NCOSP, 2009). So it makes sense to engage multiple teachers spanning multiple grade bands. Third, collaboration helps to change and sustain school culture. It is a mechanism to organically induct new teachers and administrators into the culture and provide support

for them as they transition from novice to full member of the group. It is also a way for more experienced colleagues to learn from their more current university classroom experiences.

Inquiry is the most complex concept in the phrase. As science educators, we like to use the word inquiry, because we hope teachers will engage in rigorous investigations, but also because it makes us feel scientific, and because of the big role the word is given in the National Science Education Standards (NRC 1996). Scientific inquiry is what scientists do to try to answer questions posed about the natural world, or social scientists pose about human individuals, societies, and cultures. In *Science for All Americans* (AAAS, 1989), AAAS lists the following among the characteristics of scientific inquiry and the scientific enterprise.

- Science demands evidence
- Science is a blend of logic and imagination
- Science explains and predicts
- Science is a complex social activity
- There are generally accepted ethical principals in the conduct of science

These same characteristics should apply to the work of teachers as they work to improve the learning outcomes for each of their students. In classrooms and school buildings, we hope that teachers will ask questions about how their practice, their instructional materials, their content and pedagogical content knowledge, the school culture, and parental and community support impact student learning and then conduct scientific inquiries to gain new knowledge. This knowledge can be applied in their classrooms to improve outcomes for their students.

Unfortunately, very few elementary teachers of science and few middle school and high school science teachers have actual experience in conducting scientific inquiries. By partnering with each other, their administrators, university science and science education faculty, teachers and administrators can gain access to the outside expertise they need. With their partners, they can use student and teaching data to formulate questions that can be investigated, explore the research and other resources for new ideas to try in their classrooms, implement those new ideas, and gather new data to measure their impact on the original questions and generate new questions.

Combining the discussion of the individual terms above we see that teacher collaborative inquiry is a complex concept, involving a diverse cast of players. Still, there is evidence that teachers who are engaged in collaborative inquiry improve their practice and their students' learning.

What is the evidence that Teacher Collaborative Inquiry is effective at improving teacher practice or student learning?

There are very few rigorous studies of the impact of teacher collaborative inquiry on teacher practice or student learning. Feger and Arruda (2008) published a comprehensive analysis of the educational literature on the topic of professional learning communities (PLCs) and concluded "A search of the literature on PLCs reveals a broad range of publications from guidelines for organizing PLCs, to research on their implementation.

However, rigorous research and evaluation studies of PLCs are limited in number.” Goddard, Goddard, and Tschannen-Moran (2007) concluded from a review of the literature that “fourth-grade students have higher achievement in mathematics and reading when they attend schools characterized by higher levels of teacher collaboration for school improvement.” The higher achievement was at an effect size of approximately 0.1, a small impact. The criteria for assessing higher levels of collaboration were based on the answer to the following question (on a six point Likert scale):

To what extent do teachers work collectively to influence these types of decisions?

- Planning school improvement
- Selecting instructional methods and activities
- Evaluating curriculum and programs
- Determining professional development needs and goals
- Planning professional development activities

While this is a fine list, there is no mention of using evidence or collaborating on inquiry to answer a question as we have defined it in the section above.

Still, we have a strong hypothesis based on the three points we made above and many other arguments that teacher collaborative inquiry is a valuable component of a reforming school system that will increase the achievement of its students (Crow and Pounder 1997, Evans-Stout 1998, Goddard, Hoy and Hoy 2000, Smylie, Lazarus and Brownlee-Conyers 1996, Mundry and Styles 2009). Results from our work with the NSF Math and Science Partnership project the North Cascades and Olympic Science Partnership (Landel and Nelson, 2009) also support our hypothesis. A reasonable question to ask is how teacher collaborative inquiry fits in the scheme of systemic school improvement.

How does Teacher Collaborative Inquiry fit into education reform?

Is teacher collaborative inquiry an element that can be implemented along with other critical pieces to initiate positive school reform or is it an outcome of a restructured system that is already focused on improving student learning? It is our belief that both cases are possible. Teacher collaborative inquiry can be a leading component helping drive school improvement or a following indicator of a school that has begun improving by implementing other critical elements. It is also our belief that teacher collaborative inquiry is a necessary component of every school that is successfully engaged in comprehensive improvement. Instruction focused on gaining collaborative knowledge and skills is not yet common in most preservice teacher preparation and administrator preparation programs, so collaboration must be learned *in situ*. There are many resources available to the school that is ready to begin collaborating (for example, Garmston and Wellman 2004).

A major outcome of successful teacher collaborative inquiry is that teachers take charge of their own professional development based on needs that surface from examining student learning in their own classrooms. Once this change has occurred, mutual accountability is a natural consequence. By providing convincing evidence and hypotheses, teachers can expect to receive the resources they need and administrators who supply the resources can expect to see the intended outcomes.

As examples of different approaches to implementation we will describe two schools from the North Cascades and Olympic Partnership (NCOSP) that are using teacher collaborative inquiry (which they call PLCs) in combination with other elements. These examples are taken from a recent chapter published by the authors (Landel and Nelson 2009)

Phillip Renault is an experienced middle school science teacher at Markishtum Middle School. He is also an NCOSP teacher leader who is earning his master's degree in science education at Western Washington University, supported by NCOSP. Markishtum Middle School/Neah Bay High School is located on the Makah Indian Reservation on the very northwest tip of the Olympic Peninsula. It has 161 students in grades 6-12, of whom 94% are Native American, 64% are eligible for free or reduced-price meals, and 17% are identified with special needs. Here is Phil's story:

District-wide, there had been concerns about teachers not having time to work together, to have teacher directed collaboration. Traditionally our extra non-student days have been filled with workshops on subjects like Discipline, Poverty, School Climate, Gangs, but little time was given for teacher-to-teacher collaboration. Teachers decided it was time to ask for specific time to be set aside to collaborate among ourselves, time that was guaranteed by our contract. Contract negotiations took place and we were given a half day a month specifically for teacher directed collaboration.

I imagine that from an administrator's point of view questions then start to emerge. What is teacher collaboration? What does it look like? Is there evidence that one approach works better than another?

As if to answer these questions, NCOSP provided our middle school teachers with the opportunity to work together to develop a vision and to create in a formal sense a PLC. We had a chance to demonstrate what teacher collaboration could look like using the ideas NCOSP and create a Professional Learning Community. In fact the time needed to do this throughout the school year was negotiated into our contract. As a middle school teacher, it is exciting to be able to maintain a sense of independence, a recognition that the middle school student body is different from the other ages, and as such, needs to have independence from the type of structure other grades have.

To start things off more slowly, we decided to present a three-day summer workshop examining the *How People Learn* research. We had a mini-lesson on what this might look like in the science classroom. We talked about utilizing notebooks across the curriculum and how that might look. We then looked at PLCs and came up with activities we could do as a PLC. We decided to use our teacher directed collaborative release days to look at student work. The idea is that to begin to integrate classes, we need to know more about what others are doing as well as what our students' abilities in the various subjects are. To this end we are looking at student work using protocols developed through NCOSP. We pursued this throughout the school year and are working on how to proceed next.

From 2004 to 2008, passing rates at Markistum/Neah Bay on the 8th-grade science Washington Assessment of Student Learning have risen from 19% to 47%, the state average, and at the 10th-grade level, they have gone from 0% to 48%, 8% above the state average.

Nooksack Elementary is a small rural school on the Canadian border in northwest Washington. Of the 272 students in grades K-5, 44% are female, 24% are Hispanic, 17% are transitional bilingual, 15% are identified with special needs, and 55% receive free or reduced-price lunch.

A gifted principal, who came to embrace collaboration and a focus on individual student success later in her career, led the school. She retired last year after ten years leading the school and training her successor, a former NCOSP teacher leader.

In the NCOSP baseline year (2003-2004), 41.5% of the fifth-grade students were proficient or above on the state science assessment. In 2007-2008, the fifth-grade teachers reported:

Forty-three out of forty-four fifth-grade students in Nooksack Elementary (97.8%) met or exceeded standards on the Science Washington Assessment of Student Learning. All fifth-grade students took the test and students who passed included all special education students, all ELL students, and all migrant/bilingual students. Nooksack Elementary fifth-grade teachers attribute this success rate to three main factors: system-wide adaptive changes in both beliefs and practices by all stakeholders, the use of student-involved assessment practices in all subjects, and deliberate, focused technical changes in science curriculum and instruction targeted to improve student learning.

The teachers also stated in this report that “at Nooksack Elementary, we have spent years learning new ways of working together and developing shared beliefs around teaching, learning, and achievement. **We believe that teacher collaboration and shared beliefs underlie the high achievement that we are seeing from all students in all subjects in all grades.**” [emphasis added]

These examples show how teacher collaborative inquiry fits into the broader picture of school improvement.

Conclusion

We have made the case that teacher collaborative inquiry should share the characteristics of scientific inquiry. It is a complex social activity that should be evidence-based, and be used to explain and predict classroom outcomes. Teacher collaborative inquiry involves more than teachers. School administrators and outside experts—professional development professionals, scientists, science educators—are necessary participants when appropriate. When successfully implemented, teacher collaborative inquiry is one critical component of schools where every student’s learning is important and improving.

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