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Building Leadership through Action Research

Abstract

In a poem by the Nobel Prize winning Irish poet Seamus Heaney, the narrator remarks, "She taught me what her uncle once taught her: how easily the biggest coal block split if you got the grain and the hammer angled right." Getting the grain and the hammer angled right is never an easy task for leaders in any complex organization. However, if the coal block-size dilemmas of education are to be split into problems that are manageable, comprehensible, and mutable, then school leaders will have to work assiduously and persistently to accomplish just this.

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Building Leadership through Action Research

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Introduction

In a poem by the Nobel Prize winning Irish poet Seamus Heaney, the narrator remarks, "She taught me what her uncle once taught her: how easily the biggest coal block split if you got the grain and the hammer angled right." Getting the grain and the hammer angled right is never an easy task for leaders in any complex organization. However, if the coal block-size dilemmas of education are to be split into problems that are manageable, comprehensible, and mutable, then school leaders will have to work assiduously and persistently to accomplish just this.

The Teacher/Leader Quality Partnership Program

In an attempt to get the "grain and hammer angled right" in the domain of professional development, 40 math and science teachers from the Rochester City School District (Rochester, NY) and surrounding suburban school districts participated in an initiative entitled the Teacher/Leader Quality Partnership (TLQP) program. The program, through a Title III grant, created partnerships consisting of an institution of higher education and local K-12 schools, including at least one high-need school district. Drawing on their respective experiences, skills, and knowledge, the program directors and partners worked together to design and

to implement effective professional development programs that helped practicing teachers and teacher leaders meet the needs of their students.

The TLQP Mission

At the center of the TLQP mission was an ideal that envisioned a two-dimensional goal for all professional development that can be defined as "those processes and activities designed to enhance the professional knowledge, skills and attitudes of educators so that they might, in turn, improve the learning of students" (Guskey, 2000, p. 16).

The focus of the project's efforts was centered not simply on developing knowledge and skills, but on building a professional learning community that better understands the nature of teaching and learning - particularly with an eye toward mitigating the achievement gap between affluent students and students of poverty. To accomplish the goals of the program, a wide variety of research-based strategies and skills were shared, modeled, and practiced.

In short, the design of the TLQP project attempted to construct a learning community that envisioned professional development not purely as a matter of increasing technical competence, but as one concerned with gen-

uine inquiry and thoughtfulness. Instrumental to this vision was a conception of teaching that challenged the dominant view of professional development - merely as the linear transmission of knowledge from presenter to participant. Rather, it envisioned professional development as a venue for meaningful learning and inquiry where teachers actively and purposively engaged in action research projects that were transformative, thereby enabling the participants to view themselves as both practitioners and researchers.

What is Action Research?

Action research is a systemic and often collaborative inquiry conducted by teachers and teacher leaders for the purpose of improving their practice and performance. By gathering information and evidence about effective instructional strategies, teacher-researchers explore their teaching methods for specific situations and how students learn best - ultimately leading to increasing student motivation and academic achievement.

As a spiral and reflective process, the inclination toward undertaking an action research project often commences with a single observation or phenomenon that arises from a classroom discussion or a student comment. For the TLQP program, the action research started with the formulation of a question, a problem, or an awareness of an achievement gap. Through coaching and informational sessions, participants planned (a) a means to investigate and to study the phenomenon, (b)

collected and organized both quantitative and qualitative data related to their question, and (c) kept journal notes and anecdotal records. The teachers then analyzed evidence provided in the form of student work, portfolios, or standardized achievement tests and communicated their findings to other TLQP participants as well as colleagues at their individual schools.

Action Research into Secondary School Science Learners

During the TLQP program, one high-school science teacher, Kathy Hoppe, focused her multi-year action research on Problem-Based Learning (PBL) at an alternative education program for at-risk students. Here she monitored improvement in academic performance, attitude, and interest in science.

Her action research project, "The Effect of Problem-Based Learning (PBL) Curriculum on Academic Performance, Behavior, and Motivation in High School Biology Students," connected real world biology situations to the students' lives through integrated PBL labs. During the first year of this project, Kathy found that students expressed a greater interest in biology when participating in problem-based learning units versus traditional instruction. In addition, students' results on the New York State Biology Regents final examination demonstrated an increase in academic achievement with PBL lessons. The first part of this action research project led seamlessly into the second part in which she analyzed a four-week PBL

curriculum implemented with a regional summer school program. During year two, student motivation, behavior, attendance, and academic achievement were measured. In all categories Kathy's findings and supportive evidence strengthened the claim that students in PBL biology classes were more motivated, attended class more frequently, and achieved higher passing grades versus the traditional instruction at that same summer school program with a comparable group of students.

What are the Benefits of Action Research?

In spite of the day-to-day demands teachers have placed upon them, one might expect that adding another task, namely conducting classroom research, would seem like "the straw that broke the camel's back." TLQP participants, however, through on-going support, embraced the notion of their role of "teacher as a researcher" and used their classroom as a laboratory for investigating both their profession and their practice. The project directors and coordinating team members provided print resources including Hubbard and Power's *The Art of Classroom Inquiry - A Handbook for Teacher-Researchers* and Mertler's *Action Research - Teachers as Researchers in the Classroom, Second Edition* to assist participants in narrowing a question for their inquiry, designing a data collection system, and analyzing and interpreting the evidence from their explorations.

In addition, sets of theme issues from

Educational Leadership were purchased for discussion via jig-saw strategies. Issues included "Science in the Spotlight" (December 2006-January 2007), "Teachers as Leaders" (September 2007), "Making Math Count" (November 2007), and "Data: What Now?" (December 2008-January 2009). In the end, TLQP participants expressed numerous positive declarations concerning their action research projects. Feedback from each of the monthly sessions and focus group discussions indicated that teachers felt the experience was a rewarding and fulfilling process - one that deepened their understanding of an aspect of their classroom practice not previously examined.

Changing Attitudes through Action Research

Normally, teachers conduct action research in the interest of enhancing student achievement. Although the primary goals of the TLQP program were to provide an opportunity for teachers to inquire into their own teaching practices as well as their students' learning for the improvement academic performance, this article focuses on the effect action research had on changing the important intangibles: the attitudes, values, and beliefs participating teachers held about their own professionalism and practice. Figure 1 illustrates the feedback loop identifying the intangibles in transforming teachers' attitudes and dispositions about their roles and practices.

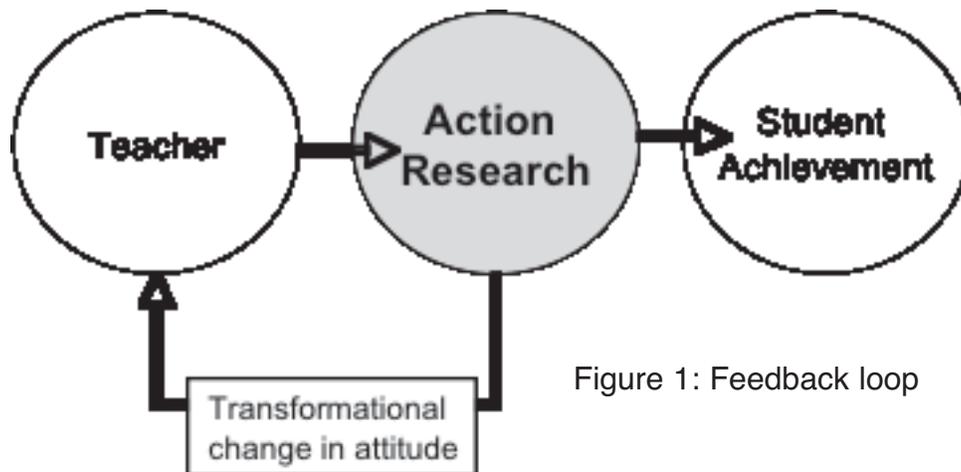


Figure 1: Feedback loop

The TLQP Evaluation Design

Following the framework of Loucks-Horsley, et al. (2010) for designing professional development and Guskey's (2000) model of evaluating professional development, the TLQP goals were assessed in a systematic approach at five interlocking levels: (1) participants' reactions, (2) participants' learning, (3) organizational support and change, (4) participants' use of new knowledge and skills, and (5) student learning outcomes. Of particular interest for this project was Level 4: participants' use of new knowledge and skills. Qualitative data was collected from a focus group and analyzed as the primary assessment indicator.

Focus Group

A focus group session was conducted with seven participants of the TLQP program, as part of a summative evaluation. The focus group session was audio-taped, transcribed, and examined for key themes using content analysis. Six themes emerged, each denoting a change in participants' attitudes or beliefs concerning: (a) effective profes-

sional development, (b) conducting action research, (c) the role of the teacher-researcher, (d) inquiry-based teaching, (e) listening to students, and (f) teacher leadership.

Based on the respondents' perspectives, the TLQP model appears to have raised the teachers' expectations for what effective professional development should embody; namely, it should be research-based, collegial, centered on genuine inquiry, and data-driven using multiple measures for assessment. Focus group members also perceived constructive professional development as a vehicle for bridging theory and practice.

Several focus group participants mentioned the restructuring process for effective professional development and how well action research modeled it, helping them guide the efforts of the professional learning communities and collegial circles that were emerging in their respective schools. A train-the-trainer dynamic seemed to emerge where the participants brought mean-

ingful models and messages back to their students and colleagues.

Numerous focus group participants described the action research project as a worthy form of professional development that can replace supervisory observations as a method of evaluating the growth of tenured faculty in some schools. They talked about how analyzing student work and collecting alternative and authentic forms of data at school was becoming more commonplace in their practice. They described these practices as a part of their own continuous development as teachers, but also connected the activities to improvement efforts in their buildings or districts. "Action research, for me," said one participant, "really validates everything that I do. I know how to collect the data, I know how to analyze the data, and I know how to assess the data. It's no longer just using my intuition."

When asked about the role of the teacher-researcher in schools, one participant commented, "It is not an assigned role," which received consensus from the other participants. "Being a teacher-researcher is not in the job description." The teacher continued, "I don't have an assigned role as that of teacher-researcher and I am not a Teacher on Special Assignment in the building. I am a 4th grade teacher. But with my combined knowledge of action research and the leadership development I've learned here (and with my Master's degree in literacy), I have a lot of people wandering into my classroom. I don't get additional pay for

anyone asking for advice, but I do feel good when people come to me and request help."

Intellectual engagement and stimulation was another attribute that permeated much of the talk of the teacher-researcher identity in the focus group discussions. Participants talked about using inquiry-based methods learned through the action research process and how meaningful that learning had been to their own scholarly growth. To that notion a high school teacher affirmed, "For me, I think being a teacher is the most important profession. Then I think about doctors. And I think, gosh, I really wouldn't want to go to a doctor who has not kept abreast with all of the medical changes when taking care of me. I really can't honestly look at a kid (pause) and I can't look at myself in the mirror (pause) if I don't keep on top of my craft. And yes, it's exhausting, but I think we owe it to our kids. And these are the kinds of the things that - I mean - I drive all the way from Penn Yan to come to this. But this is what I was looking for. This is really meaningful."

Listening to students was another theme that emerged from the focus group comments. Teachers suggested that their action research experience helped them to be better observers and listeners of students. In spite of the pressure of accountability in their schools, these teachers wanted to look beyond standardized test scores to see if they were being successful with children. "I'm seeing the grades of the kids as not being the ultimate judge of what

they are getting out of the class,” explained one teacher. “This was what I was looking for - Do they understand it better? Maybe they’re still having difficulty with algebra. Are they having trouble figuring out how to use the keys on their calculator? I think teacher-researchers see their students as active learners and not as acquisitionists of content. I no longer view students’ minds as containers with me pouring information into them.”

Several participants believed that action research helped them become a better resource for administrators and other teachers, and with that added responsibility comes a certain level of respect and trust. One participant commented, “Administrators who encourage and support teachers to be teacher-researchers demonstrate respect and trust for the person in a profession that cultivates personal and professional growth. I feel bad for teachers in other places that don't have that.”

Closing

The coal block is the symbol of the problems and the promising possibilities embedded in many of social and organizational systems that we inhabit. The problems are large, bulky, and ever-present - just like our physical resources of coal. The possibilities are waiting to be created.

If we are to turn that coal potential into power, into something usable, we will need to break it into manageable pieces just like the enormous challenges educators face. To do that we will need

teacher-researchers with both problem knowledge (the grain) and the right tools (the hammer). Action research and teacher leadership is an untapped resource for many schools. Changing the attitudes and beliefs of teachers and their profession can start with a single swing of the hammer.

References

Guskey, T. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.

Loucks-Horsley, S., Stiles, K., Mundry, S., Love, N., & Hewson, P. (2010). *Designing professional development for teachers of science and mathematics, 3rd ed.* Thousand Oaks, CA: Corwin Press.

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Developing and Assessing Students' Science Process Skills: Inquiry Centers

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Abstract

Inquiry Centers are science-focused stations consisting of everyday materials, along with open-ended questions or open-ended tasks. Using an Inquiry Center Approach, upper elementary and middle school students can construct their own Inquiry Centers and interact with their classmates' centers, while teachers support and assess the development of their basic process skills. Deliberate instruction and encouragement of the development of these skills is essential in preparing students for successful problem-solving experiences.

Purpose

The vast majority of inquiry-based science curricula used in Elementary and Middle Schools are referred to as "skills-based" curricula. Science process skills or abilities reflective of the behavior of scientists (e.g. observing, inferring, predicting, measuring,

etc.) are used while students are engaged in the active exploration of science concepts. The use of science process skills and the learning of science concepts become inseparable when a skills-based curriculum is implemented. Colvill & Pattie (2002) state that a "skills-based" science program is necessary if teachers base their lessons on problem-solving or inquiry-based learning experiences; "nothing can be more frustrating in a problem-solving program if the work is held up by a lack of skill in the basic processes" (pp. 20-21). Problem-solving activities require scientific reasoning and critical thinking abilities which, in-turn, require proper use of the basic science process skills. Therefore, teachers must not take for granted that students have adequately developed these skills; rather, "we must be deliberate in how we instruct students and encourage their development of these skills" (Froschauer, 2010, p. 6).