WHAT SHOULD COUNT AS DATA FOR DATA-DRIVEN INSTRUCTION?
Toward Contextualized Data-Inquiry Models for Teacher Education and Professional Development

Shannon Pella
University of California, Davis

This study was designed and conducted in an educational climate in which school and teacher accountability for student learning is increasingly connected to students' performances on standardized tests. The participants in this study, 5 middle school English language arts teachers, each rejected their district-sponsored data-driven instruction professional development models in favor of a more contextualized collaborative data-inquiry process: lesson study. Over a 2-year period, participating teachers engaged in 9 inquiry cycles focused on teaching and learning writing across participants' culturally, linguistically, and economically diverse middle school classrooms. This article highlights how participants' collaborative analysis of qualitative data broadened their knowledge for teaching and learning writing and promoted their development of a more responsive, rigorous, and integrated literacy pedagogy. Findings from this study suggest that teacher education and in-service professional development models that aim to support teachers in professional learning through data-inquiry must broaden the notion of what counts as data for data-driven instruction.

For well over a decade, accountability for student learning and overall school performance has been associated with standardized test scores. Consequently, American public school districts nationwide have become increasingly focused on data-driven school improvement (Blink, 2007; McLeod, 2005; Supovitz & Klein, 2003; Schmoker, 1999). Current research suggests that the use of standardized test scores, school, community, and student demographic data have been effective to inform general program improvement objectives (Bernhardt, 2009; Blink, 2007; McLeod, 2005). However, for the classroom teacher

• **Shannon Pella,** University of California, Davis. E-mail: smpella@ucdavis.edu

these data alone inform a narrowly focused agenda and are insufficient to develop responsive pedagogy. A slice of the research on teacher professional development that has focused on evidence-based practice advocates the collection and analysis of multiple forms of data, some from summative assessments and other data from teachers' ongoing formative assessment of students (Coburn & Talbert, 2006; Marzano, 2004).

In a time of persistent gaps in achievement, and growing numbers of students in America with linguistic diversity, teacher education and in-service professional development cannot afford to engage in one-size-fits all models of test score data-driven instruction. Models for teacher education and professional development that include sustained inquiry cycles and contextualized investigations of student learning have been widely recognized by both scholarly and practitioner communities for their contribution to transformed teaching practices (Lieberman & Miller, 2008; Lieberman & Wood, 2003; Darling-Hammond, 1989, 2002).

In order to instantiate the promise of a data-driven professional development model for teachers, this study was drawn from a larger ethnography in which five middle school language arts teachers transformed their writing pedagogy through their participation in a lesson study (Pella, 2011). In the lesson study, participating teachers selected topics in teaching and learning writing and collaboratively designed lessons around the topics. Following a traditional lesson study model, the teachers observed each other's teaching. During the observations, participating teachers took field notes, recorded their observations, interacted with each other, and interacted with students in the context of the lessons that they designed. After each observation, teachers debriefed their observation notes, analyzed student work, and studied the impact of instructional methods on student learning outcomes. Participating teachers engaged in the collection and analysis of rich qualitative data sources that were rooted in the context of teaching and learning. These data were part of a sustained data-inquiry cycle that fostered higher expectations of students, increased self-efficacy among participating teachers, and authentic professional growth (Pella, 2011).

In the present study, I focused specifically on the contextualized qualitative data collection and analysis practices of these five middle school English language arts teachers. This study addressed the following research question: How did participating teachers' collaborative analysis of qualitative data impact their writing pedagogy? Three themes emerged from these questions and will be discussed as the following findings: The lesson study model, a form of collaborative and contextualized inquiry, afforded opportunities for participants to (a) analyze qualitative data from observations and (b) analyze data from student work. As they analyzed these data and triangulated their interpretations in a collaborative inquiry process, participants (c) transformed their approaches to writing instruction; toward a more responsive, rigorous, and integrated literacy pedagogy.

These findings suggest that teacher education and in-service professional development models that include sustained and collaborative analysis of various forms of contextualized qualitative data, hold great promise for teacher pedagogical development.

THEORETICAL FRAMEWORKS

The notion that teachers and schools should be held accountable for student learning and that teacher professional development models should build teachers' capacities for data-driven instruction, are both central premises supporting this study. However, the current educational accountability culture is overly reliant on test score data to determine both program and teacher efficacy. Thus, data-driven instruction is an ideal objective for teacher professional development when the data sources are varied and collected through cycles of deeply contextualized teacher inquiry. For

teachers to develop the skills and knowledge that foster academic achievement in culturally and linguistically diverse classrooms, a broadened data collection and analysis process is particularly necessary. In order to make the case for a variety of forms of data to count as data for data-driven instruction in diverse classrooms, this study drew from a wide range of literature that supports contextualized inquiry, the formative use of data, pedagogical reasoning, equity pedagogy, and the features of professional development models that support teachers' pedagogical development.

Contextualized Inquiry and a Teacher's Formative use of Data

The application of information from various data to design responsive instruction has been well documented in the literature that supports a teacher's continuous instructional improvement through ongoing inquiry (Cochran-Smith, 2009, 2010; Cochran-Smith & Lytle, 2003). Whichever term is applied; collaborative inquiry, data-inquiry, data-driven instruction, teacher action research, or teacher inquiry, the process includes a systematic analysis of data through which teachers investigate the relationship between instruction and student learning.

Lesson study is a form of collaborative inquiry which involves collaborative topic selection, lesson design, group observations of lessons, observation debrief, and the cycle repeats. Lesson study is a popular form of teacher professional development across Japan. In both Japan and the United States, lesson study has been shown to contribute to the knowledge base and pedagogical development of teachers (Chokshi & Fernandez, 2004; Fernandez, 2002; Lewis, Perry, & Hurd, 2004; Lewis, Perry, & Murata, 2006). Lesson study involves teachers in a deeply contextualized process of investigating teaching and learning through the collaborative analysis of various forms of classroom data. Findings from decades of research on inquiry-based professional learning suggest that inquiry promotes

pedagogical development when the inquiry process is grounded in authentic and contextualized investigation of teaching and learning (Bradbury & Reason, 2001; Darling-Hammond, 2006; Fernandez, Cannon, & Chokshi, 2003; Fernandez & Chokshi, 2002; Wilms, 2003).

One feature that contextualized inquiry models share is the cyclical investigative model, in which teachers engage in formative assessment of student learning. According to Black and Wiliam (1998b), formative assessment includes "all those activities undertaken by teachers, and by the students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged." (p. 2). In this way, teachers' use of *any* data to drive instruction is the formative use of data. One problem with the test score data-driven notion of formative assessment is that the information from a test score is general and vague and often reveals little about what could have been done differently during instruction. Another problem with the use of test score data as a tool for formative assessment is that this method relies on the use of data from tests that are given sporadically throughout the school year. When assessment is detached from teaching by weeks or even months, instructional interventions may be equally detached. If too much time has passed between the assessments and the instruction, the gulf between the two becomes difficult to bridge. The use of formative assessment as a sustained process of instructional design and revision, involves the integration of assessment into the daily activities of a teacher (Black & Wiliam 1998a; Dysthe, 2007).

A teacher's integrated formative assessment during instruction can provide immediate data to drive relevant, appropriate, and immediate instruction. Wolf (1993) argues that assessment is a living thing, not a static event like a standardized assessment. "Assessment ought to be live: that is, conducted in the face, and threat, and promise of real work" (p. 216). Wolf further suggests that assessment must be

part of a process that cannot be completed in one isolated assessment event but instead, "must take the form of a series of iterative episodes of work followed by time for personal reflection" (p. 220). A variety of forms of classroom data are necessary to support instructionally embedded formative assessment; data provide a focus for teachers to reflect on the pedagogical reasoning that occurred during instruction.

Pedagogical Reasoning

In a model of pedagogical reasoning and action posited by Shulman (1987), reasoning by teachers about their teaching includes the reflective evaluation of student understanding both during and after a teaching and learning event. This process of self-evaluation includes "on-line checking for understanding and misunderstanding that a teacher must employ while teaching interactively" (p. 18). Further, pedagogical reasoning involves ongoing teacher inquiry because "Evaluation is also directed at one's own teaching and the lessons and materials employed in those activities, [and] leads directly to reflection [which is] the use of particular kinds of analytic knowledge brought to bear on one's work" (p. 19). This process of evaluation and reflection, in pedagogical reasoning, can lead to "new comprehension" which can encourage teachers to develop a new repertoire of activities for teaching. Ongoing, formative assessment and pedagogical reasoning are only possible during cycles of authentic inquiry. According to Shulman (1987),

> When a teacher thinks through the teaching of something, the activity is a bit like the manufacture of a suit of clothing. Adaptation is like preparing a suit of a particular style, color, and size that can be hung on a rack. Once it is prepared for purchase by a particular customer, however, it must be tailored to fit perfectly.… When we speak of teaching under typical school circumstances we describe an activity which brings instruction to … typically 25 to 35 students. Thus, the

tailoring of instruction entails fitting representations not only to particular students but to a group of a particular size, disposition, receptivity, and interpersonal chemistry. (p.17)

Like the tailoring of a suit, a teacher's tailoring of instruction requires the teacher to understand how to fit the content to the specific students in the room. Inquiry cycles which involve data collection through observation, reflection, and ongoing formative assessment, can be part of a teacher's process of understanding the connections between teaching and learning. Active investigations of a variety of aspects of student learning are specifically critical in classrooms where students have traditionally underperformed on standardized tests. The analysis of test scores alone, particularly in diverse classrooms where there has been under achievement on tests, results in an oversimplification of student learning needs. Furthermore, test scores fail to acknowledge students' funds of knowledge: the cultural and cognitive resources that students bring to school from their family and community backgrounds (Gonzalez et al., 1995). Qualitative data can provide information that enables teachers to access students' funds of knowledge and use this knowledge to build bridges to academic content (Gonzalez et al., 1995).

Equity Pedagogy

The theoretical frameworks that support equity, culturally relevant, responsive, and authentic pedagogy suggest that teachers must be able to understand students' funds of knowledge. Furthermore, teachers must know how to use students' prior knowledge to build bridges to higher-order thinking, and engage students in rigorous and challenging instruction (Alvermann, 2002; Gay, 2000; Ladson-Billings, 1995, 2001; Secada, Gamoran, & Weinstein, 1996; Wehlage, Newmann, & Secada, 1997). Thus, a teacher who seeks to develop a culturally responsive equity peda-

gogy must learn how to use a wide range of strategies and teaching techniques such as cooperative groups, simulations, role-playing, and discovery (Banks & Banks, 1995). An equity-oriented pedagogy depends on a broad range of knowledge about the individual students in a given classroom and as such, cannot be developed through the limited analysis of test score data and a single curriculum. According to Banks and Banks (1995), equity pedagogy involves varied "teaching strategies and classroom environments that help students from diverse racial, ethnic, and cultural groups attain the knowledge, skills, and attitudes needed to function effectively within, and help create and perpetuate, a just, humane, and democratic society" (p. 152).

For a teacher to develop responsive equity-oriented pedagogy, a variety of forms of data must be collected and analyzed; varied data are necessary to inform the design of engaging and relevant instructional experiences. Banks and Banks contend that "helping students become reflective and active citizens of a democratic society is at the essence of our conception of equity pedagogy" (p. 152). Test score data alone cannot provide the information needed to promote student reflection and active participation. In order for teachers to develop equity pedagogy, data-inquiry must include teachers' analysis of qualitative data. Qualitative data may include observations of student engagement, participation, and learning, the analysis of student performance and work samples, and a teacher's reflection before, during, and after instruction. In order to address the needs of *all* students, particularly academically underachieving students, an inquiry-based teacher professional development model offers opportunities for the collection and analysis of a variety of data to inform responsive instruction.

Features of Effective Models for Teacher Professional Development

According to her extensive review of the literature on teacher professional development, Desimone (2009) suggested that there is a research consensus on the main features of professional development that have been associated with changes in knowledge and practice. These features include: (a) content focus (b) active learning (c) coherence (d) duration, which includes twenty hours or more of contact time, and (e) collective participation. These are the "features of professional development worth testing" (Wayne, Yoon, Zhu, Cronen, & Garet, 2008, p. 472), and as such, they should be included in impact studies on professional development.

Each of these features was evident in the lesson study model that provided a learning context for the teachers in this present study. For example, there was a strong and central content focus. The topics for investigation were focused on developing literacy instruction in general, and more specifically focused on developing writing lessons in two of the middle school writing genres: response to literature and persuasive writing. Active learning and collective participation were particularly salient features of the learning model; teachers in the lesson study actively and collaboratively determined their areas of interest, selected foci for investigation, designed lessons, and observed each other teach the lessons. Participants actively adapted the model to suit their learning needs by setting norms for interaction with students during the observed lessons and deciding which forms of data would be collected and analyzed. Duration was also strength of the present study as teachers engaged for 3 full years in the lesson study project. Two of those years are the focus of this present study.

Coherence, in teacher professional development, has been described as "the extent to which teacher learning is consistent with teachers' knowledge and beliefs" (Elmore & Burney, 1997, as cited in Desimone, 2009, p.184). Throughout the lesson study, participating teachers sought to balance a variety of contrasting beliefs and knowledge they had developed about teaching and learning. For example, they valued both teacher-directed

instruction as well as methods that engaged students in collaborative and discovery-based literacy activities. As participants negotiated a balance, or "theoretical equilibrium" (Pella, 2011) between contrasting theories and diverse approaches to writing instruction, they progressed toward a balanced literacy pedagogy which more authentically reflected their beliefs about teaching and learning.

Thus, each of the features worth testing: coherence, content foci, active learning, duration, and collective participation (Desimone, 2009) was embedded in the lesson study model described in this present study. Additionally, the theoretical frameworks discussed in this section support a comprehensive data-inquiry process which includes the formative use of qualitative data, and ongoing pedagogical reasoning to inform the development of a responsive pedagogy.

METHODS

Research Design

The lesson study involved nine cycles of collaborative topic selection, lesson design, observation, debrief, and the analysis of student learning. Over a 2-year period, each teacher was observed at least twice. A small grant paid for teacher release days to observe each other 5 days per year. Monthly meetings to plan and debrief were held outside school hours. The topics selected for investigation included the use of writing templates, sentence starters, and formulas for integrating evidence from text, collaborative writing, self and peer evaluation, analysis of persuasive arguments, an author's use of diction, revision, and students' analysis of audience and purpose for writing across genres. Various types of texts were selected by participants from published speeches, editorials, videos, music, art, and literature. The texts ranged in tone, complexity and genre as well as in the authors' backgrounds, ages, and points of view.

Data Collection and Analysis

This study documented 2 years of lesson study with an additional third year of research to instantiate generative teacher learning outcomes from the lesson study. Throughout the 2-year lesson study, I collected data by audio taping and transcribing participants' discourse from more than 100 hours of planning, debriefing, and classroom observations. I took extensive field notes to document participants' discourse and behavior as they planned, taught, shared data, and reflected on the lessons they observed. My field notes captured the interactions and discussions of participants during their own data collection and analysis process. Participants' field notes and student work samples were also part of my data collection. During the third year of this research, I documented the transformed pedagogical approaches that participants developed from their lesson study experiences. I observed participants individually, conducted interviews, and held two focus group sessions: one in January and one in June.

In my qualitative data analysis process, I used the "Content analysis and analytic induction method" as well as the "Constant comparative method" (Merriam, 2003). The analytic induction method was a critical methodology for this study. Analytic induction involved selecting a tentative hypothesis and testing the hypothesis against an instance of phenomena. As the phenomena appeared to support the hypothesis, I tested further instances of phenomena against the hypothesis until the hypothesis was adequately supported by data (Merriam, 2003). My tentative hypothesis was that the collection and analysis of qualitative forms of data, such as, observation and student work data, would foster the development of substantial new knowledge for teaching writing. I used the content analysis and constant comparative method to confirm that each of the data sources I analyzed described teachers' qualitative data analysis as a catalyst for their transformed pedagogy.

Throughout these analytic processes, I triangulated my data with participants' recorded data in order to code for themes that illustrated how participants' analysis of contextualized data influenced their pedagogy. In my coding process, I assigned codes to observation notes, the collaborative analysis of observation notes, and discussions during participants' analysis of student work that connected specifically to pedagogical shifts. This process also involved coding the elements of teachers' pedagogy in order to trace pedagogical shifts. My earliest codes for pedagogy characterized standardized forms of teaching writing through the use of structured formulaic templates. The shifts were evident as I coded more rigorous analytical, collaborative, and multimodal activities that participants designed to foster students' engagement in thinking for and about writing.

I applied tracers to these coded features of participants' pedagogy and found that during the second year of the lesson study, participants sought to balance an broaden their pedagogical approaches to include more complex texts, critical thinking, collaborative, and multimodal activities as they applied information from their data-inquiry process. The codes that most frequently served as catalysts for transformation were participants' collection and analysis of observation data, sharing those data with other participants, and their collaborative analysis of student work. Each time these activities were evident, they were connected specifically to a transformed approach to teaching writing which evolved into broadened literacy pedagogy. In other words, participants' data-inquiry included the progressive inclusion of increasingly complex texts and various reading activities into their writing instruction therefore; I characterized participants' transformed approach as not only responsive, but also a more rigorous, integrated and balanced literacy pedagogy.

Participants and Settings

Four of the participating teachers were female and one was male. Each was a middle school language arts teacher. Two participants taught seventh grade, two taught eighth grade and one taught sixth grade. They were all Caucasian and between the ages of 25 and 40. Although participants were not a culturally and linguistically diverse group, they were representative of the current majority demographic of teachers in both California and the United States (Snyder, Dillow, & Hoffman, 2009). Following the National Writing Project (NWP) institute fellows model, participants were selected through recommendation by NWP teacher consultants and followed up with recommendations from school site administrators.

Three of the participants at the onset of this study, Laura, Gary, and Rachel (all pseudonyms) were NWP teacher consultants. They had each conducted teacher inquiry and action research in an area of writing instruction and were considered by the local NWP affiliate and their school site administrators to be committed to ongoing improvement. The other two teachers, Talia and Elizabeth, did not begin this lesson study project as NWP teacher consultants. However, by the end of the 2-year lesson study, they had each participated in a summer invitational institute and became NWP teacher consultants.

None of the participants in this lesson study had been offered a writing methods course in their teacher preparation program. The majority of their in-service professional development for writing instruction had been through their voluntary participation in NWP professional development. Each participating teacher expressed concern about their districts' data-driven instruction models in which they were required to analyze their students test score data in order to determine instructional use of their tightly paced, district-adopted curricula.

Each of the five teacher's classrooms was in a separate district. Two of the classrooms were in urban districts, two were in suburban districts and one was in a farming community in a small rural school district. The five settings, some up to an hour and a half apart, were a unique advantage in this study as the diverse settings provided opportunities for teachers to

observe each other teaching in classrooms and communities that varied widely in community and student demographics. All names of schools, communities, places and people are pseudonyms.

FINDINGS

All five participating teachers were frustrated with their districts' notions of what counts as data for data-driven instruction. In district sponsored in-service teacher professional development, the only data sources that participating teachers were encouraged to analyze were students' scores from standardized tests. This frustration, and an interest in a deeper, more contextualized form of professional development, was the catalyst for their voluntary participation in this study. Each participant sought a professional development model where they could collaborate, investigate, and learn about teaching from a sustained focus on actual teaching and learning.

The lesson study model provided opportunities for participants to collect and analyze a wide range of data and apply their new knowledge immediately to their practice. Participants' engagement in this process over 2 years resulted in noticeably transformed writing pedagogy. Although participants were initially focused on developing isolated and structured approaches writing instruction, they gradually integrated reading, literature, and various textual mediums e.g. print, video, audio, and art into their writing pedagogy. Therefore, the resultant pedagogy is better described as responsive, rigorous, and integrated *literacy* pedagogy. The structured supports and explicit teaching methods remained a part of each teacher's pedagogical repertoire, yet as they continued to investigate connections between teaching and learning writing, they increasingly included more complex texts, rigorous critical thinking and multimodal activities into their approach to writing instruction.

Discussions detailing these findings are divided into four sections. The first section provides background about the high-stakes testing and accountability climates that frustrated participating teachers and motivated them to seek a more authentic model for professional learning. The following three sections respond to the research question: How did participating teachers' collaborative analysis of qualitative data impact their writing pedagogy? Three themes emerged from these questions and will be discussed as the following findings: The lesson study model, a form of collaborative and contextualized inquiry, afforded opportunities for participants to (a) analyze qualitative data from observations and (b) analyze data from student work. As they analyzed these data and triangulated their interpretations in a collaborative inquiry process, participants (c) transformed their approaches to writing instruction; toward a more responsive, rigorous, and integrated literacy pedagogy.

Background: Participants' Frustration With District-Sponsored Teacher Professional Development and Interest in Collaborative Inquiry

Participants in this study taught middle school language arts in five different school districts, yet shared similar frustrations about their schools' over-focus on test performances. They discussed early in the project their interest in distancing themselves from what they thought was an over emphasis on standardized tests both in their school culture and for in-service professional development.

Assessment-Driven Accountability Culture

Participants were motivated to engage in this lesson study because they felt that their districts' in-service professional development opportunities were not amenable to meaningful teacher learning. They were each frustrated with the accountability culture that they believed was too closely connected to high-

stakes tests. For example, two participants described pep rallies at their sites where laptop computers and I pods were awarded to the students with the most improved test scores. At another participant's school, selective lunch parties were held in high profile locations on campus, where only students who raised their scores on quarterly curriculum-embedded assessments were invited to attend. Participants each shared anecdotes about ways in which test scores were seen as the ultimate reflection of both student and teacher achievement. The following is an excerpt from a discussion about the impact of test scores on one school's awards and recognition program:

Gary: My (colleague's) school raised their Annual Performance Index (API) by over 60 points and held an assembly to celebrate. In attendance were the entire student body, staff, and members of the community. Selected students were called to the stage and given medals for scoring either proficient or advanced on the California Standards Test (CST) or demonstrating significant growth on the CST. After the students were recognized and applauded by their peers, several teachers were called to the stage. These teachers were given awards for raising the highest number of students' test scores. After several teachers were recognized and applauded, the presenter addressed the audience and asked, "Students, do you see all of your teachers up here?" Students responded with a chorus of, "No …" The presenter remarked, "Well, students… even your teachers need to work harder!"

Unfortunately, test score fixation is not unique to that school site. The unintended negative consequences of high-stakes tests have been well documented in the literature (Jones, Jones, & Hargrove, 2003; Nichols & Berliner, 2007). Increased test pressure has also led to increased numbers of tests. Participants discussed how their middle school students have experienced a dramatic increase in the number of assessments they are expected to take in the course of a year. For example, in addition to

the California English Language Development Test, and the annual CST, district benchmark tests in Math and Language Arts are each given four times per year in four participants' districts. These district benchmark tests are designed to gather data to compare student test performance in the fall, winter, and early spring in order to address student test preparation needs before the CST in late spring. In one participant's school, her district-adopted Language arts curriculum assessment is also given three times per year in addition to quarterly benchmarks and the annual CST. In her school site, a scanner has been provided so teachers can scan the results from the benchmark and curriculum assessments into the district's data base. Thus, teachers at that site have access to new test score data approximately every 2 months.

Data-Driven Professional Development. In-service teacher professional development, across all five participants' districts, was designed in the context of an assessment-driven school culture. Data-driven instruction, a stated accountability goal for teachers and schools, promoted a narrow agenda for teacher pedagogical development. One participating teacher described her experiences with in-service professional development:

Rachel: Last year I participated in approximately 40 hours of professional development. Each of these workshops was required by my district, and each was focused on data-driven instruction. We were given charts and graphs of our students' test score data by our district data services department. The charts showed how our students performed on each content standard. Once we determined which standards needed more instruction, we were instructed to use standards-based, district-adopted curricula in order to plan our instruction accordingly.

In these professional development experiences, teachers were also informed about which of the English language arts standards were most often tested on the CST. For exam-

ple, another participant described his experiences:

Gary: In our last district-sponsored workshop, we spent the first 2 hours of a 6-hour in-service, color-coding each standard in the curriculum pacing guide according to the degree to which each standard is tested on the CST. Then we were asked to put tally marks next to the chapters in the district-adopted textbook to indicate which chapters addressed the most tested standards. The purpose of this exercise was to highlight which chapters in the textbook were the most tested on the CST so we would know which chapters to give more instructional time.

In each of these opportunities for professional development, there were missed opportunities to learn how to use various types of data. In each of these examples, there was no mention of any other kinds of data that could be used to drive instruction, nor was there mention of how daily, contextualized formative assessment techniques could be used to design instructional interventions. The only assessments discussed were the district benchmark tests, curriculum-embedded assessments, and the CST. The only data discussed were the test score data that resulted from these assessments. For the past 5 years, these have been participants' typical experiences from district-sponsored in-service teacher professional development.

According to Talia, "They call it inquiry but it's not.… Every month for at least 2 hours, we are required to use this 'data-driven inquiry-cycle' to analyze test scores and plan instruction from the district-adopted, standards-aligned curricula."

Participants' Motivation to Engage in Lesson Study. Participants had each sought out this lesson study as an alternative to their districts' data-driven instruction model. Early in this study, each participating teacher had indicated a compelling interest in meaningful and transformational professional development. The following are examples of these interests:

Talia: In my district, the "inquiry cycle" means you go to the meetings and highlight test score data and fill in district mandated goals and objectives based on the test score data … but you never get to think about what kids really know and you don't get to try any new ideas … it is just like learning is for our students … it doesn't become yours unless you get the chance to practice it and then you own it.

Gary: I will play the game, I'll go and I will highlight the (test score) data on the spreadsheet … but I would like to go to professional development and actually learn something and then try it out in my classroom and actually talk about it with other teachers. Instead of hearing, "here are your highlighters and here is your spreadsheet—look at the scores … highlight … and plan your lessons accordingly."

Similar to Gary and Talia, Rachel felt that her school site's data-driven instruction model encouraged teachers to develop content knowledge based on the test content, develop pedagogy through the use of limited teaching methods, and develop knowledge of students assets and needs in terms of their performance on a variety of tests. This narrow pedagogy should more accurately be called "standardized assessment pedagogy." Standardized assessment pedagogy, like "teaching to the test;" it is an impoverished relationship between a teacher's knowledge of the test (content), knowledge of pedagogy (teaching the test), and knowledge of the learner in terms of the student's test performances. For example, Rachel explained, "I used to think of Josef (pseudonym) as my shy bilingual student who liked to draw cars. After analyzing his test score data, he became Josef, the far-below-basic, [English language development] student in the high-risk subgroup."

Participating teachers resisted developing standardized assessment pedagogy by voluntarily engaging in professional development experiences that were offered in a variety of settings. From NWP workshops to National Board certification seminars, each participant

sought meaningful professional development to balance their district's test score data-driven instruction model. The following excerpts are from the written reflections of two teachers that chose to engage in this lesson study as a way to further their understandings of student learning without focusing primarily on test score data:

Gary: I want to form a group where we can share some of the best lessons we do with our students—lessons that get at each of the writing genres and give students the skills and knowledge they need to be in control of their writing. I can't do that with my highlighter and my spreadsheet- only by seeing it (student learning) will I know what to do about making it happen again …

Elizabeth: All of my professional development I have found myself … I pay for it myself, and it usually is worth it. If I can see how something will work, I will try it.… Our school's professional development doesn't lend itself to using things especially because we don't get to see it happening …

Laura: I want to do this (lesson study) so I can observe you all and I want to know that when you observe me that you will help me see what I didn't see in my class even as it was happening … sometimes I miss the best things when I am teaching and with you all there to report everything … it's like I need ten extra eyes in my classroom!

Clearly, participants were motivated to engage in this collaborative inquiry for similar reasons. They resisted the development of standardized assessment pedagogy and opted instead, to develop knowledge from investigating teaching and learning in the context of teaching and learning. In the lesson study, participants designed lessons together based on a collaboratively determined topic. They observed each other teaching the lessons, and analyzed various forms of data from the lessons they observed. The following section illustrated the power of participants' observation data to inform their instructional next steps and to ultimately transform their writing pedagogy.

The Lesson Study Model: Teachers' Collaborative Analysis of Observation Data

This section of findings responds to the broad research question: How did participating teachers' collaborative analysis of qualitative data impact their writing pedagogy? Various forms of observation data were integral components of participants' qualitative data analysis. The lesson study provided regular opportunities to collect, analyze, and triangulate various forms of observation data from teaching and learning in various classroom contexts. These data were significant catalysts for teacher pedagogical development.

The use of observation to describe, understand, and interpret phenomena has been long recognized as an imperative for qualitative research. According to Merriam (2003), observation becomes a research tool when it, "serves to formulate research purpose, is planned deliberately, is recorded systematically, and is subjected to checks and controls on validity and reliability" (p. 95). Although participants' observation records were largely informal, these data proved to be among the most valuable sources for their pedagogical transformation.

During each of the nine classroom observations, teachers took field notes, recorded direct quotes from students, used checklists, and kept running records of student participation. In the immediate debriefs after each observation, participants' discussions incorporated the notes from these varied observation data. For example, in one lesson, Elizabeth kept track of student participation on a checklist; as she observed students during the lesson, she recorded which students contributed to class and small group discussions. She also recorded the levels of depth related to the students' contributions. In another lesson, Gary asked questions to students as he went around the room recording their answers as informal field notes.

Gary used this technique daily and collected enough data to notice shifts and changes in this students thinking, reading and writing. These data were part of the discussions following each observed lesson.

There was a consistent pattern across all nine cycles of lesson study: participants observed students during the lessons, shared these observations during the debrief, triangulated their data and their perceptions about student learning during the lesson, and emerged with new understandings of teaching and learning writing. The following is an example of this recurring pattern:

Analysis of Observation Data: Rachel's Lesson. Rachel's class was made up of seventh and eighth grade students; all students were English learners whose California English Language Development Test scores categorized them as early intermediate and intermediate. Students came from diverse linguistic backgrounds their native languages included Farsi, Punjabi, Spanish, Mandarin, Cantonese, Mien, Hmong, and Russian.

The majority of the writing that her students had done for the first half of the school year was narrative and response to literature. When participants observed her in February of the first lesson study year, Rachel was beginning a four week unit on persuasive writing. She began this unit with a "gallery walk," which was a discovery-based genre analysis activity that participants had collaboratively designed earlier in the first year of the lesson study. This activity provided an introduction to persuasive writing and focused on academic vocabulary such as claim, evidence, argument, thesis, audience, and purpose. Participants believed that by investigating several persuasive texts which varied in complexity, tone, form, and author's background, age, and point of view, Rachel's students would be better prepared to craft arguments and support their claims with evidence in their own writing.

For the gallery walk activity, Rachel posted the persuasive texts that participants had selected together at various points around the room. When designing this lesson, participants selected excerpts from a variety of texts; an editorial, a film review, song lyrics, a speech, and a novel. In each excerpt the registers, purposes, and the intended audiences were different. Each of the texts that participants selected seemed engaging and Rachel thought her students would be interested in the topics. As the gallery walk lesson began, Rachel's students went to each station in the room with their groups. In each group, one student read the excerpt aloud. Students discussed the teacher-created questions and individually recorded their answers. The questions addressed the purpose and audience for each text and then asked students to evaluate the strength of the authors' claims and to evaluate the evidence used to support the claims. Rachel used the theme song from *Mission Impossible* to signal when it was time to move to the next station. Rachel also wore a white lab coat and carried a large magnifying glass to encourage her middle school students to act as detectives.

Throughout the lesson, Rachel and the participating teachers moved around the room observing students, recording notes, prompting students to think and discuss some of the pieces, and recording more notes. In the debrief that immediately followed the lesson, participants shared their observations, triangulated their perceptions of student learning, and emerged with new understandings about teaching and learning writing. The following excerpt is an example of this pattern:

Elizabeth: I noticed in each of the stations a recurring theme—many of the students were struggling to separate their own opinion (about the topic) from the argument of the author in order to evaluate the strength of the argument.

Rachel: I talked to them about that at the *Twilight* center because some of them, especially the boys, hate *Twilight* and didn't even want to read the reviews of *Twilight* because they had such strong opinions about the movie and the actors. Their reactions were so strong that they had to really step back from their opinions about the movie and just try to

read the review objectively. It was good to try to get them to separate out their opinion from the opinions of others.

Elizabeth: I heard, I think his name is Kevin? say, "I want to say I agree with (the first piece) but the second one's argument is stronger" and that is when I told him that he did a really good job because he was supposed to evaluate the strength of evidence in the argument, not whether or not he agreed with the argument.

In this example, Elizabeth introduced a theme from her observation notes: student objectivity in evaluating the strength of an argument. Rachel confirmed that she also had a similar concern during her observations of students during the lesson. These perceptions, triangulated and validated, formed new knowledge. The new knowledge involved a perception among teachers that critical thinking requires a certain degree of open-mindedness or objectivity, which needed to be more explicitly taught to students. The next few lesson study cycles were focused on designing activities where students could position themselves as open-minded evaluators by taking on the role of analysts as they provided feedback for each other's writing. This pattern was repeated consistently throughout the nine cycles of lesson study. The observation feature of the lesson study and the collaborative triangulation of observation data resulted in new understandings of teaching and learning writing. This new knowledge was put to use immediately following each lesson and progressively built toward broadened literacy pedagogy.

The Lesson Study Model: Participants' Collaborative Analysis of Student Work Data

This section will discuss another form of qualitative data that participating teachers collected and analyzed from student learning: student work data. In qualitative research, the collection and analysis of artifacts can help the researcher uncover meaning, develop under-

standing, and discover insights relevant to the research problem (Merriam, 2003, p. 133). The data from artifacts and various documents can, "furnish descriptive information, verify emerging hypotheses, advance new categories and or hypotheses, offer historical understanding, and track change and development" (Merriam, 2003, p. 126). Further, "documentary data are objective sources of data compared to other forms of data … and can ground an investigation in the context of the problem being investigated" (p. 126). In the present study, the written student artifacts that were generated from each of the lessons designed and observed by participating teachers, served as valuable documentary data sources.

Participants' analysis of student work data occurred in various contexts. Most often, participants collaboratively analyzed student work that was produced from the lessons that participants observed. Occasionally, teachers shared student work samples that were produced in lessons that were extended from the observations and tried out in teachers' individual classrooms. Every lesson that was designed, delivered, and observed by participants was adapted, repeated, or extended by participants in a subsequent observation or modified and delivered by individual teachers in their classrooms. Because the lessons were each extended, revised, and consistently modified throughout the 2 years of the lesson study, the student work generated from these lessons was of interest to all participating teachers.

On six occasions during the 2-year study, I documented clear connections between the analysis of student work and transformed pedagogical approaches. In other words, the collaborative discussions around the student generated data sets were integral to participants' formation of new approaches to teaching writing. These transformed approaches, as discussed earlier, were characterized by increasingly integrated approaches to teaching writing that included structured supports as well as open-ended activities. In the following example, participants had just observed Talia teach her eighth-grade class and were in an

observation debriefing meeting. This observation took place in May of the second year of the lesson study. In this example, participants were analyzing student work data that Talia organized for them. Talia's objective was to share how her students' writing had grown from September to that day in May.

Analysis of Student Work: Talia's Lesson. Talia's class was made up of eighth grade students; six of Talia's students were English learners whose California English Language Development Test scores categorized them as intermediate and early advanced. The English learners in Talia's class were each native Spanish speakers. By May, Talia's students had written in a variety of genres. Students wrote narrative, persuasive, response to literature, poetry, and research essays. When participants observed her in May of the second lesson study year, Talia was well into her investigation of peer writing groups. In peer writing groups, Talia's students shared their writing, provided feedback to each other, revised their writing, and reflected on the revisions. Participants had collaboratively designed these peer writing group experiences in the lesson study and were eager to observe them in action.

The lesson that participants observed in Talia's classroom was focused on the ways in which students engaged in peer feedback. Talia's students were seated together in groups of four and each student had copies of the essays that had been written by their group mates. One student at a time read his or her essay while each of the members of the group wrote notes on the draft they had been provided. Feedback was shared around the tables, both verbally and in writing. At the end of the class period, students were given 1 week to revise and submit their revised essays to Talia. During this lesson, participating teachers sat in on student discussions, took notes, and asked questions. Immediately after the lesson, participants met to share observation data and to analyze the student work data that was generated from this and other lessons focused on peer feedback and revision.

Talia had prepared sets of student work data that had been generated by her students from another class 1 week earlier. These data sets contained students' first drafts of a persuasive essay, and students' self-reflections that were written before sharing their writing with peers. The data sets also included the peer feedback that students had received for each piece of writing that they shared in their writing groups with each of their peer's suggestions highlighted in pink. Talia also shared the revised drafts of each of her student's writing in which students had highlighted their revisions in green. Talia's students reflected on each of the revisions that they had made and explained why they made each revision. Additionally, Talia compared beginning of the year writing to these students' current writing samples.

These extensive data sets provided participants the opportunity to analyze not only the way students engaged in peer feedback and revision, but also afforded them the chance to see how students had grown in their thinking and their writing. In the discussion, Talia explained, "The grade weighs heavier due to the growth. I based the grades on demonstrated reflections so that students would understand that it was the reflection and the thinking that was key—not the writing itself necessarily." Talia explained how she analyzed each data set for growth by comparing students' first drafts to their peer feedback, suggested revisions, final revisions, and reflections. Talia explained that her students' written reflections showed the most growth in writing. In the following exchange, participants examined the data sets, shared ideas about what they saw, and triangulated their perceptions about student learning:

Talia: All of these kids are in the same writing group, and this girl (pointing to a sample) is an example of putting a higher level student in a struggling group. It actually worked well for everyone … even the more advanced student got feedback that she used.

Laura: This group mostly revised for grammar and spelling … but this group gave each other feedback on voice and word

Talia:

choice—look at this …" Powerful voice here- try using words like this more!" That is great feedback.

Not every student has the same quality of feedback, some pointed out basic errors in spelling or length of paragraphs … but some students made phenomenal comments, comments I myself would have included like, "good, but make sure to include a conclusion strategy (anadiplosis and anaphora)," or "make sure to tie the idea back to your thesis" or "try using some $1.00 words" or "try using another attention grabbing introduction because the one you used didn't really grab my attention." It (setting up peer writing groups) was so hard at first but it seems really worth it now.

Elizabeth:

I like how you built feedback into the accountability piece … they *had* to provide feedback … and they *had* to use the feedback that they were provided … for their grades. This seems like a piece we should keep … a peer writing group feedback piece in every writing unit.

This example illustrated how participants' collaborative analysis of student work data motivated them to continue to design lessons that fostered student collaboration and critical thinking. The analysis of student work data ultimately played a role in the transformation of participants' approaches to teaching and learning writing. These transformed approaches included a broadened, integrated literacy pedagogy that blended various texts and structural supports with collaborative, multimodal, and critical thinking activities for and about writing. The next section will describe these transformations through excerpts of participants' reflections.

Transformed Practices: Toward a Responsive, Rigorous, and Integrated Literacy Pedagogy

This concluding section of findings discusses the culminating theme that emerged from the research question: How did participating teachers' collaborative analysis of qualitative data impact their writing pedagogy? As participants analyzed various data and triangulated their interpretations in a collaborative inquiry process, participants transformed their approaches to writing instruction; toward a more responsive, rigorous, and integrated literacy pedagogy.

Over the first 2 years of this study, participants selected topics and designed lessons around their chosen topics. Together they determined which teacher would teach which lessons and they collaboratively observed the teaching. Observations were recorded and data were discussed immediately following each lesson. Participants shared their perceptions of student learning and analyzed student work from each lesson. Often student work from an individual teacher's class was introduced to validate, confirm, or question a strategy or method that teachers tried out in their individual classrooms. The student work was collaboratively analyzed much like the observations, in order to share ideas and perceptions of how teaching methods impacted student learning.

Participants' collaborative data analysis afforded multiple levels of triangulation. For example, each participant triangulated his or her own data sets that they had individually collected from observations and various student work samples. Then, together as a group, they negotiated and coconstructed collective interpretations of each other's data by engaging in what amounted to a multidimensional triangulation process. These collaborative data analysis sessions afforded opportunities for participants to more deeply investigate the connections between teaching and learning and to study how various activities inspired student engagement.

Informed by new knowledge, participants selected more rigorous topics and by the second year of the lesson study, participants had introduced varied texts, media, collaborative, and multimodal activities to support these more complex foci. For example, in the early part of the first year of the lesson study, topics included investigating the efficacy of scaffolds and supports such as templates, formulas, and

sentence starters for increasing and improving students' writing. Throughout the second year of the lesson study, participants investigated increasingly complex and integrated reading and writing activities such as: genre analysis, text evaluation, point of view development, voice, students' self-reflection, and collaborative peer evaluation. As a result of this progression, participants' transformed pedagogy is best characterized as responsive, rigorous, and integrated literacy pedagogy.

In the third and final year of this study, I observed each teacher at least four times, held structured interviews, two focus group sessions, and invited written reflections from each participating teacher. Through this follow up research, I was able to validate that each teacher had undergone significant pedagogical transformation and had both maintained and built upon what they had learned from their lesson study experiences. The following excerpts from two participants' written reflections reflect the consensus among participants that analyzing contextualized qualitative data in a collaborative inquiry was the catalyst for each of their pedagogical transformations:

Gary: Teaching in a small rural school is, at times, isolating. And while I enjoy the freedom it sometimes provides, I miss connecting with colleagues. And that's what the lesson study has given me: an opportunity to connect over big, meaningful ideas. Quite literally, it has opened my eyes. With each observation, I watched in awe as amazing colleagues tried something new. I left each meeting exhausted, my mind buzzing with ideas and questions and desperately wanting more time with my students to try everything I had just seen. To be honest, I would not be doing the things I do in my classroom if not for this experience. My students would not be in peer writing groups, they would not have focused on "Voice" and my beliefs about what they are able to do would not be as strong as they are now. The lesson study has pushed me and supported me, it has forced me to reflect and be critical. And it has allowed me to share some of what I do and what I have

learned. In the end, my students get the benefit of having five other writing teachers—who sometimes come to visit—but whose influence is deeply woven into my teaching.

This excerpt, from Gary's written reflections at the end of the 2-year lesson study, reflects two main themes from this study. The first is that he was able to gain valuable new knowledge about the connections between teaching and learning in the context of his own and his colleagues' actual teaching. Second, Gary's participation in the collection and analysis of qualitative data, such as, observation and student work data, and the opportunity to triangulate data with his lesson study colleagues, had a profound and lasting impact on Gary's literacy pedagogy.

Each participant's literacy pedagogy was far broader and more integrated at the end of the study. As discussed earlier, at the beginning of the lesson study, the activities that participants investigated initially involved structural supports and somewhat standardized approaches. As they began to see the limits of formulaic approaches to writing instruction, participants increasingly investigated more complex concepts. These topics motivated participants to integrate multimodal activities for students to access higher-order understandings of more complex issues in reading and writing. As illustrated in earlier sections of this article, participants designed collaborative group activities for students, gallery walks, technology rich activities, music, video, and visual art. In the following excerpt from her exit interview, Elizabeth reflects on how her pedagogical approach to teaching writing evolved from teaching isolated writing skills and formulas into a more integrated literacy pedagogy:

Elizabeth: Before lesson study, I felt most comfortable with response to literature, but the essays I taught were strictly formulated with a rigid outline. Through the lesson study, I have been exposed to and encouraged to present academic writing in more accessible, engaging,

and meaningful ways. I will now always try to include a variety of different creative means of outputs. For example, in my first year of the lesson study, I developed the final assessment for a novel in which students could choose to make a game board, a song, reenact in the form of a play, draw story boards, or write a paper. I will combine these creative forms of output with written reflection and personal connection. Another major influence of the lesson study is the addition of the interesting, meaningful methods of input I provide for my students. Now my lessons include gallery walks, art, pod casts, picture books, music, and meaningful group work.

The lessons that participants designed, observed, analyzed, and revised throughout the 2 years of the lesson study built new knowledge for teaching writing. However, the lessons themselves were not the catalysts for pedagogical transformation. The collaborative analysis of various forms of observation data and student work artifacts and the application of information from these analyses, were the catalysts for participants' transformed pedagogy. This qualitative data analysis process, across five divergent school contexts, was a part of a meaningful and lasting professional development experience for all five participating teachers.

DISCUSSION

Accountability for student learning is a necessary objective for teachers and schools. However, if schools are held accountable for only the student learning that is reflected in standardized test scores, then it is logical that teachers would be encouraged to develop standardized assessment pedagogy. On the other hand, if schools are held accountable for student learning that is demonstrated across various circumstances of performance, then teachers must develop a richer knowledge base about the connections between teaching and

learning. Thus, teacher education and professional development data-inquiry models must engage teachers in the analysis of various forms of qualitative data that are generated from meaningful contexts. The first step to a more useful and effective version of data-inquiry is for districts, schools, and teachers to re-evaluate which forms of data constitute valid evidence of student learning. According to Coburn and Talbert (2006),

> Moving toward a coherent systemic strategy for evidence-based practice, may require a system of evidence use that allows for, and supports, access to different kinds of evidence, for different purposes, at different levels of the system. Individuals with different work roles have substantively different data needs. A strategy for evidence-based district reform … requires going beyond the sole use of standardized test scores to collect and make accessible to educators a broader range of data capable of answering different kinds of questions that people in different roles face in the course of their ongoing work. (p. 491)

The collaborative analysis of a variety of qualitative data from contextualized inquiry contexts can expand teachers' knowledge for teaching across all grade levels and content areas. Data that include observations of students as they are learning, as well as artifacts from a variety of learning activities, contribute to the development of an informed and responsive pedagogy.

In this study, all five participating teachers were eager to improve their teaching and broaden their students' literacy skills. Additionally, they shared a common interest in building knowledge and pedagogy that valued rigor and equity. In school settings where there are differences in vision and mission, as well as differing degrees of enthusiasm for improvement, any professional development model, including lesson study, would likely face challenges. However, if teacher professional learning models are designed to include contextualized, collaborative and qualitative data-inquiry, then the potential to significantly

improve learning opportunities for *all* students is a possibility that is certainly worth testing.

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