

# Changing Hearts, Minds, and Actions through Collaborative Inquiry

**I**t was the first day of a new school year in Columbia, South Carolina, and fourth-grade teacher, Julie Waugh, was chatting with her students as they gathered their belongings to head home. Julie leaned in to become a part of a small-group conversation. She wanted to connect with Caitlyn, a child who was new to our school. Julie asked her, “So how was your day?”

Caitlyn’s face lit up as she responded, “I feel smarter here. People care about what I have to say. I have time to say what I am thinking and people listen to me. And you listen to me.”

Julie smiled knowingly, understanding why one day at her new school might have had such an impact on Caitlyn’s identity. Caitlyn had become part of a class and school culture where teachers and children engage in collaborative inquiry, where students’ insights, ideas, and questions are treasured, where teachers create curriculum with and for children. From the moment Caitlyn crossed the threshold of her new classroom and began interacting with her teacher and young colleagues, she somehow knew her voice and thinking would be honored.

## **Inquiry in the Classroom**

It all started 18 years ago when two university faculty members, Heidi Mills and Amy Donnelly, joined forces with several teachers (including Tim O’Keefe) and a local South Carolina school district to create an elementary school—the Center for Inquiry (CFI)—from the ground up. Like so many productive social changes, this CFI was born when a small group of like-minded educators began dreaming of a better world for public education.

Our guiding questions were: What is? and What might be? We talked with Jerry Harste, a renowned literacy scholar and founder of CFI in Indianapolis, Indiana, about the work he and Chris Leland, professor of literacy at IUPUI, were doing at their school. We read Deborah Meier’s book, *The Power of Their Ideas* (1995), and imagined how we might transfer and transform the work at Harlem’s Central Park East elementary and secondary schools to teach for democracy in Columbia, South Carolina. We visited the Manhattan New School for a first-hand opportunity to explore the impact of shared principles and practices across classrooms. This professional inquiry, while overwhelming at times, convinced us that we, too, could create the school of our dreams. We wrote a proposal to create a university–public school partnership organized around inquiry-based instruction and presented it to three local school districts. We will always be grateful that Richland School District Two shared and supported our vision.

Collaborative inquiry was at the heart of our school’s belief system from the beginning: “Curriculum is created with and for children. A sense of wonder and thoughtfulness about knowledge, the learning process, and our world is fostered and negotiated in predictable and democratic ways” (Mills, 2001, p. xx). Over the years, across a range of teachers and hundreds of elementary students, we have focused on bringing this belief to life moment by moment, day in and day out, across the curriculum.

For us, inquiry is a stance that promotes authentic, intentional, and systematic learning. We strive to make learning in school reflect the way

learning occurs in the world through an apprenticeship model. In describing inquiry, Mills (2014, p. xxi) offers the following:

- Instead of teaching about plants, we invite children to think, work, and communicate as botanists.
- Instead of teaching about a culture, we help children pose questions and make observations as anthropologists.
- Instead of teaching about insects, we show children how to look at the world and use the tools of entomologists.
- Instead of teaching about history, we explore how historians use primary and secondary sources to reconstruct events and record stories of significant moments in time. (Mills, 2014, p. xxii)

This shift means that our students do not simply learn about reading, writing, math, science, and social studies. They do what readers, writers, mathematicians, scientists, and social scientists do. In short, our kids learn how to read, write, and think mathematically, and they learn how to use reading, writing, and mathematics as tools for learning as young researchers in the sciences and social sciences.

We've learned that when teachers truly respect children's capacity to engage in research and to construct (not simply consume) knowledge, we send messages that promote the development of competent, productive identities with a strong sense of agency (Johnston, 2004). When children see that their knowledge and actions can impact their world, it is energizing. They become inspired, strategic, self-motivated learners.

The decision to engage kids as researchers is far-reaching. It impacts their identities and sense of agency. It also impacts the generative nature of knowledge and learning. As teachers, we understand that knowledge is tentative and always changing in the world. In the classroom, however, we often send unintentional messages that convey knowledge as static and permanent. When we invite kids to pose

questions, make careful observations, interpret them from their unique perspectives, and then share their findings, kids become our mentors. Kids have the capacity to push one another and their teachers to see the world anew. Ben Brabson, a physicist at Indiana University, described the process of the apprentice becoming the mentor eloquently in an interview on learning to be a physicist (personal communication, 1990). He put it this way:

We find that our undergraduate students are sometimes our best collaborators. We find their minds are not as cluttered by the paraphernalia of the standard models. They are not constrained by the conventions of the discipline. The conventions of the discipline are always old. They are never on the edge and the discipline by its nature works from the edges and young minds have no difficulty going straight to the edge.

So, too, in our classrooms. As teachers, we are often blinded by how and what we learned, by the content and strategies promoted in the standards or curriculum materials, by our own cultural experiences and biases. If we give kids a chance, they help us outgrow conventional knowledge, ways of seeing and being in the world. If we give kids a chance, they help us question what we think we know. By deliberately teaching children the skillfulness of inquiry, they co-construct knowledge and enrich everyone's understanding, tall and small.

The work children do to collect data, analyze findings, and take action informs and transforms them and their world and provides a bridge between the questions we often use to frame classroom inquiry: "What do you wonder?" "What do you notice?" "What does this mean?" In our classrooms at the Center for Inquiry, we position students as *creators* of knowledge who access new learning to imagine and evaluate new ways of being—whether as readers, scientists, or, most important, citizens of the world.

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## Professional Inquiry

As teachers, we inquire in front of and alongside our students. We also engage in ongoing professional inquiry. Through weekly curricular conversations, we reflect on and grow new beliefs and practices. We regularly notice and name beliefs that underpin our practices by exploring classroom videos and studying student artifacts together. Since CFI is organized around a philosophy, not a program, “Our classrooms are united philosophically, yet each classroom community is unique because the teachers know it is their right and responsibility to collaborate with children when making the theory their own in their own ways” (Mills & Donnelly, 2001, p. xix).

Over the years, we have found that our actions reflect our *core* or *foundational beliefs* (Harste &

Burke, 1977). That is, if we believe learning is a social process, we offer students ongoing opportunities to teach and learn from one another across the day. If we believe children need to learn to read like writers, we design mini-lessons and writing workshop engagements intended to teach them to do so. If we believe it is important for children to see themselves in books, we deliberately create classroom libraries with high-quality multicultural books. This critical insight has helped us make our implicit beliefs explicit for reflection and revision. We constantly ask ourselves whether our actions or practices reflect our beliefs. When we notice an anomaly or disconnect between the two—i.e., silent classrooms, isolated reading and writing experiences, books in our classroom libraries that solely reflect the dominant culture—we make a change.

### FOR INQUISITIVE MINDS

#### Resources to Guide Research and Inquiry in the Classroom

We identified a number of professional mentors throughout our piece. While they are central to our current thinking, there are so many more who have shaped our hearts, minds, and actions over the years. This list reflects a few of our latest and greatest reads.

Meier, D. (1995). *The power of their ideas: Lessons for America from a small school in Harlem*. Boston, MA: Beacon. This book was written by our hero, Deborah Meier, whose school inspired the birth of ours and many more across the country. Deborah shows what is possible when teachers and students conduct research on issues that matter in their lives.

Shagoury, R., & Power, B. M. (2012). *Living the questions: A guide for teacher researchers*. Portland, ME: Stenhouse. In the second edition of their masterpiece, Ruth Shagoury and Brenda Miller Power offer a theoretically sound and practically relevant framework for teacher research. Their guidance—in concert with an abundance of teacher research vignettes—offers tremendous support for teachers interested in engaging in genuine classroom inquiry.

Lysaker, J. (Ed.). (2013). *Teacher inquiry in literacy workshops: Forging relationships through Reggio-inspired practice*. Urbana, IL: National Council of Teachers of English.

This publication brings the authentic teacher research stance that is so integral to Reggio Schools in Italy to our world. The editor and teacher researchers show how student empowerment is cultivated by teachers who embrace Reggio beliefs and who develop relationships with students so that their voices and actions become the center of the curriculum.

Oyler, C. (2012). *Actions speak louder than words: Community activism as curriculum*. New York, NY: Routledge. Celia Oyler does a masterful job of showing how to engage kids in substantive social action projects. In so doing, readers are provided tremendous lessons in teaching for democracy and social justice. She shows how teachers make social action projects a central feature of the curriculum. As kids change their minds, they change their worlds.

By studying the change process itself, we have come to realize the power of an inquiry stance in professional development. When we inquire, we envision *new beliefs* that are often *ahead of our practices*. As a result, our most significant growth occurs when we *intentionally work to live into new beliefs*. In short, through weekly curricular conversations, professional readings, and teacher research, we grow new beliefs. It's the birth of new beliefs that inspires us to develop or take up new instruction and assessment practices (Stephens & Mills, 2014).

As we engage in professional inquiry within classrooms and across our school, we construct new insights about teaching and learning. Our latest and most profound curricular epiphany is this: *The process that propels our professional growth parallels the process that promotes growth and change in our students' beliefs and practices*. We now recognize the importance of teaching in ways that impact our kids' beliefs, not simply their content knowledge or learning strategies. This happens most frequently when we position kids as researchers. When kids pose and investigate issues that matter, they learn so much more than content and strategies, *they also change their hearts, minds, and actions*.

The following vignettes show what is possible when teachers honor students enough to create curriculum with and for them through student-directed research projects. Tim O'Keefe and his third graders deepened their understanding and use of effective reading strategies by collecting and analyzing interview data from parents about their own reading strategies. Tim also shares how he and his kids embarked on an inquiry into food waste in the cafeteria. They collected, analyzed, and reported patterns in their data, which inspired them to lead healthier, less wasteful lives. Scott and his fifth graders embarked on citizen science projects to grow new beliefs and practices that make a difference in the natural world.

## Kids as Reading Researchers

At CFI, Tim teaches readers by inviting them to investigate the reading process for themselves. Through reflective conversations around reading strategies they use, children get to know themselves

and each other as readers. When teachers talk with children reader-to-reader, they help students get in touch with themselves as readers by noticing and naming the strategies they are employing. Our goal as teachers of readers is not to walk students through a curriculum or a set of stories or books, but rather to develop what Tishman, Perkins, and Jay (1994) called, "a strategic spirit—a special kind of attitude encouraged in a culture of thinking, one that urges students to build and use thinking strategies in response to thinking and learning challenges" (p. 3).

We want our young readers to develop a fluid set of reading strategies to take on and embrace challenging fiction and nonfiction materials. We wish to instill the sense of agency and initiative that Peter Johnston (2012) describes in those who have developed a dynamic theory of learning: "These children were confident that they could solve problems. . . . They didn't blame their intellect or anyone else for any lack of success—or even consider themselves to be failing. Instead when they ran into trouble they gave themselves instructions and reviewed what they knew that might help them" (p. 15).

Tim also believes we can enhance literacy learning opportunities by inviting the kids' parents to share their reading strategies. Although we typically ask parents to sign reading logs and respond to report cards, we rarely invite parents to share *who they are as readers*, to make their reading strategies explicit, to become an integral part of ongoing literacy conversations.

He brought this belief to life by inviting parents to reflect on and share the strategies they used to make sense of print when reading. His students' parents responded enthusiastically.

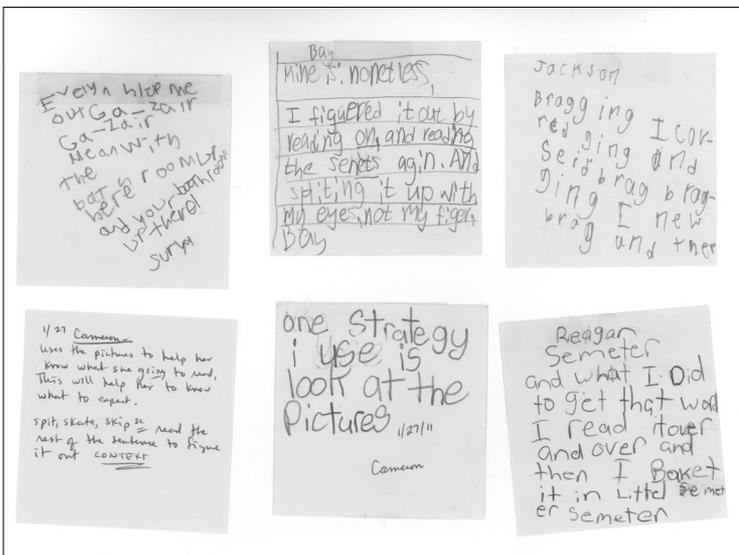
Tim engaged his third graders in collaborative research by investigating the reading strategies their parents used to construct meaning. Tim believes that reading is a meaning-making process and his instruction on reading strategies reflected this belief. Years ago, he institutionalized strategy-sharing

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sessions to conclude independent reading (IR). Tim's students regularly gather together on the carpet in the front of the classroom to share strategies they employed during IR. Sometimes they document the strategies they used on sticky notes to guide their talk and to give their teacher authentic reading process data for his kidwatching notebook (see Fig. 1). Other times, they simply engage in a conversation around the strategies they used to construct meaning that day. Tim also highlights strategies he notices his young readers using and offers examples from his own personal and professional reading experiences.

Tim started using these strategy-sharing sessions to inspire his students to research their own strategies and those of their teacher and peers. Once he recognized the power of bringing parents' voices into the curriculum, he expanded strategy-sharing sessions by creating an engagement for students to collect, analyze, and report findings from parent reading process data. In short, his third graders became reading researchers.



**Figure 1.** Students contribute to a list of reading strategies they have used.

## Inviting Parents into an Investigation of the Reading Process

Once Tim decided to bring parents into their reading conversations, he posed this question to them in a mid-January newsletter: *What do you do to figure out the meaning of new or unfamiliar words or passages when you are reading?* The feedback was overwhelming, with some parents discussing how they read complex work-related manuals and others sharing the strategies they use for figuring out words in novels and other texts they read for pleasure. Tim reminded the parents, just as he did with children, to document strategies that helped them make meaning. Tim continually asserted that all of the strategies shared in the classroom as well as the ones submitted by parents were only there to help us understand, enjoy, and learn from reading. Even the purely mechanical strategies such as *sound it out* or *break it into chunks* are only useful when they lead to understanding and appreciating what you read.

After printing out multiple copies of the parent responses, the children were asked to look for patterns in the data. They cut and sorted the reading strategies into logical categories to better understand what experienced readers do when encountering difficulties. In short, Tim designed this engagement to co-construct knowledge about the reading process by analyzing the parents' data set. The parent responses included comments such as:

- Use context cues. Look at the rest of the sentence and see if the idea of the sentence helps me to figure out the meaning of what I don't know.
- I ask a really smart person who might be nearby.
- I continue to read a sentence or two ahead and then I look back at the confusing part.
- I think back on what I know about the character or the subject.
- Sometimes I skip the word and continue reading if it is not critical to my understanding of the story.

The children sorted and shared their reasoning in small groups as the categories emerged. As they talked about the precise meanings of what their parents said, Tim noticed them deepening their talk about the reading process itself. Some categories were fairly straightforward. *Skip the word, Read on, Sometimes I skip the word and continue reading* went together for most groups. Others were a bit more elusive, though still perceptive and informative, such as *Focus on key words, Visualize the story to help me make connections to the words*.

As Tim's students worked in small research groups, he noticed them debate, adapt, compromise, and use sophisticated logic to condense 45 different adult responses into 9 categories. After all of the small groups finished their analyses, Tim asked the students to gather together to share with the class. Some of the most powerful learning took place during the whole-group sharing. One category, for instance, was fairly well established until a student made a well-reasoned argument for switching. When that happened, they deepened their understanding of the process itself as they negotiated the patterns and renamed categories. The negotiations went like this:

**Sierra:** I think that *Sometimes I skipped the word and continue reading* goes with *Sometimes I just keep reading if it's not critical to my understanding of the story*.

**Tim:** (moved the slips together to visually reflect her suggestion) Why would you have those go together?

**Sierra:** Because they sound right together and they're sort of like each other.

**Tim:** Yeah, they both involve just *keep on going*, right? This one says, "I just keep reading," and this one says, "I just skip it." They both involve the same act of just . . . moving on—I'm leaving that word behind.

**Alana:** I had three.

**Tim:** You had three in one category?

**Alana:** There are actually three that have actually been used (in other groupings), but our table thought they went together better.

**Tim:** OK, sure, what do you think? It's open for interpretation.

**Alana:** It was (she slides some slips from columns already placed on the floor to form a new column) these two and this one. . . .

**Tim:** (reads the ones she selected) *I think back on what I know, Use picture cues, and Just keep reading*. OK, after listening to Sierra's [grouping], do you see that those two kind of go together, too? Yeah, there might be more than one way to put these into groups.

**Alana:** I agree with hers, but our group just had other ideas.

After negotiating responses from one category to another across the week (see Fig. 2), the class agreed on the final nine headers and taped the parent responses under each one in a semi-permanent fashion (see their result for "Context" in Fig. 3). Even after deciding on the final categories, the class revised the chart a few times. *How It Feels* was added next to *Context*. *Guessing* was changed to *Making an Educated Guess*.

**Context**—*I continue to read a sentence or two ahead and then look back at the confusing part.*

**Skipping**—*Sometimes I just keep reading if it is not critical to my understanding of the story.*

**Experience**—*I think back about what I know about the character or subject.*

**Guessing**—*Just use what I think it means and go on.*

**Asking**—*Read it to someone else.*

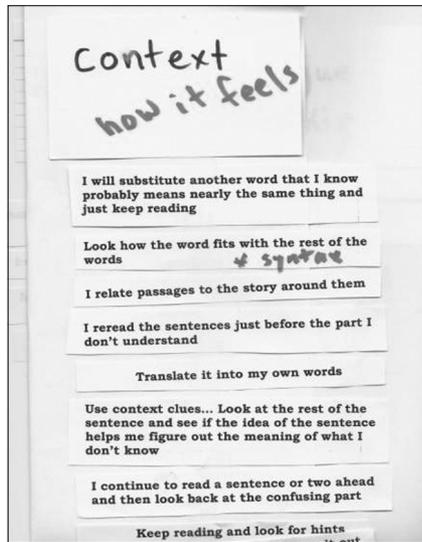
**Relying on Self**—*Read aloud; sometimes hearing the words helps you understand.*

**Mechanics**—*Look for patterns in the words or chunks in the words that I know.*

**Read Again**—*Read it 2, 3, 4 times to try to figure it out.*

**Umbrella**—*Make sure I understand what I am reading.*

**Figure 2.** Students brainstorm and revise a categorized list of reading strategies.



**Figure 3.** Students organize parent responses to questions about their reading strategies into negotiated categories. This one represents the category “Context.”

### Seeing the Reading Process Anew

By engaging students in research on their parents’ reading strategies, Tim deepened their understanding of reading as a complex enterprise. Together, they all grew new understandings about the process. The students learned that there are many, varied, effective strategies available to them as readers. After all, their parents, models of experienced readers, were the ones who suggested these strategies. As the children co-constructed the categories, they recognized what it meant to be strategic; for example, if one strategy didn’t work, there were many others to try because different strategies fulfill different needs, depending on what is being read and for what purpose.

Through this engagement and the frequent follow-up conversations about literacy, the students were positioned as reading researchers and their parents became critical mentors. Tim expanded the school’s apprenticeship model to include parents as they all co-constructed knowledge about the reading process, fluidly moving in and out of mentor and apprentice roles. Tim turned the parents’ strategies back to them in a newsletter with the finished “published” list. In so doing, Tim urged parents to access the list when coaching their children as readers at home. Through this

engagement, Tim demystified the reading process for his students and their parents. He positioned them to co-construct and own reading strategies for themselves. From that point on, Tim and his students accessed the engagement as their touchstone literacy experience.

### Kids Investigating Food Waste in the Cafeteria

For us, a balanced literacy curriculum provides ongoing opportunities for students to learn language, learn about language and learn through language (Halliday, 1975). In this second vignette, Tim positions his students to inquire into literacy and to get in touch with themselves as readers and writers during reading and writing workshop. He also positions them to use literacy and mathematics as tools for learning. They learn how to use literacy and mathematics to design and implement research projects in response to problems they encounter or issues they ponder.

### Third Graders Investigate a Problem Close to Home

Tim’s third graders recently investigated troubling issues in the school cafeteria. They were in charge of the schoolwide Student Voice Council (SVC). SVC is intended to inspire democratic action by asking kids to notice, name, and act on dilemmas within their classrooms or school. They do so to make the school a better place to live and learn. Every Tuesday morning, K–5 student representatives from classrooms across the school attend SVC to share concerns or issues they want to address. Kids often raise issues like the noise level in the cafeteria, running in the Gathering Area, attentiveness during whole-school learning celebrations, and trash on the playground. Because a number of matters emerged around the cafeteria, Tim’s class decided to take them on as young researchers.

For several days, the children in Tim’s class were the first ones in the cafeteria, poised to collect and record data on clipboards. Their task was to simply document what they noticed; they were not there to make judgments about what they saw,

but rather just to record their noticings objectively. They recorded observations about the noise level. Several children noted that many kids spent more time chatting than eating. Others noticed a lot of rushing, rushing through the lunch line and rushing to finish lunch to socialize. Several kids noticed children were throwing away an incredible amount of food every day.

They debriefed after returning to their classroom. When a few kids raised the problem of food waste, others chimed in with similar observations. Since Tim's class had just begun collecting canned food for a local food bank, the cafeteria waste seemed even more atrocious.

The kids decided to engage in further data collection and analysis with the goal of minimizing wastefulness in the cafeteria. They identified vegetables as the category of food being thrown into the trash most often. When Tim engages his students in genuine research, he teaches them to ask: *Who would like to know this information?* The kids believed their data might help the cafeteria manager make better choices by offering a menu of healthy choices the children prefer. They decided to poll the school to see which vegetables kids prefer. They asked every student to respond to this question: *What are your three favorite vegetables that you would like to have served in the cafeteria?*

**Seeing Eating Habits and Food Waste Anew**

After four days, the results from across the school were tallied. The kids sorted, counted, and organized almost 600 votes. To begin, several children read the individual results and created an enormous tally chart (see Fig. 4). Since they were striving to determine the most popular vegetables from among dozens identified (and thus the ones most likely to be eaten by the majority of the children), they focused on the top five. The class worked together to show the schoolwide results in two giant graphs (see Figs. 5 and 6). One was a bar graph where the bars were artistic representations of the vegetables (the votes for celery were drawn as a huge celery stalk, for example), and the other was a dinner plate graph (an artistic rendition of a pie graph).

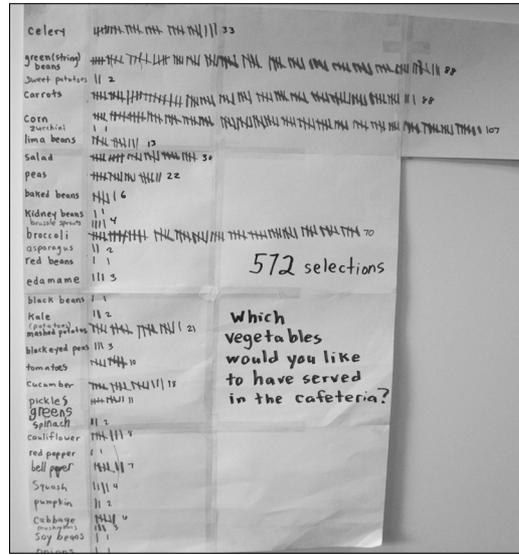


Figure 4. Students tallied the results to their questions about reading strategies.

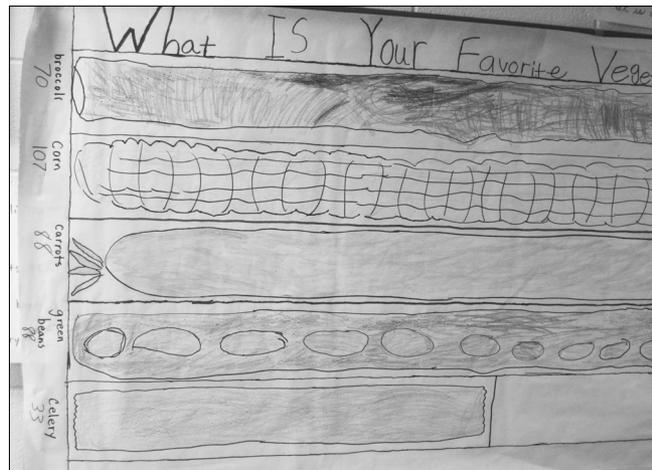


Figure 5. This bar graph shows survey results on students' favorite vegetables.

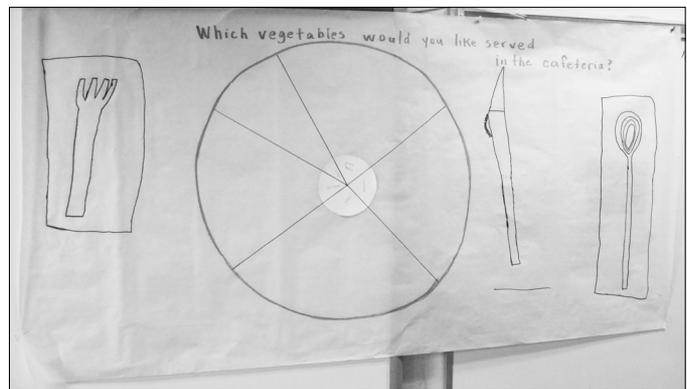


Figure 6. Survey results were also represented in a bar graph.

Because researchers share their findings with interested others, Tim's students revealed the results of their investigation during their schoolwide Friday Learning Celebration. The following week, the kids invited the cafeteria manager and SVC representatives to visit and ponder their results. They used their data to make suggestions for minimizing food waste by asking the cafeteria manager to consider their findings when placing food orders in the future. This inquiry helped Tim's third graders learn how to collect, organize, interpret, and share quantitative data. It also prompted them to develop new beliefs about their own eating habits and hunger in their community. Finally, they developed a stronger sense of agency by taking social action on their data in an effort to make their school a healthier, less wasteful place.

## Young Citizen Scientists

Mercer (2002) states that teachers should not focus on instructing a "disparate set of individuals" but rather, create a culture of inquiry in which students "take an active and reflective role in the development of their own understanding," (p. 9). In cultures of inquiry, students apprentice one another under the guidance of the teacher or other, more knowledgeable members of the community. Since members of this culture of inquiry are constantly positioning themselves as learners, the roles of mentor and novice are never static (Jennings & Mills, 2009; Paradise & Rogoff, 2009) as we explain in our third vignette.

During the Summer of 2012, eight teachers from the CFI apprenticed themselves under the mentorship of Dr. Brian Helmuth, a world-renowned

### NOW ACT!

#### Monitoring Our Beliefs and Practices

We have learned to ask ourselves if we are living our model. Do we, as teachers and university partners, engage in intentional and systematic inquiry with and for our students? Do we ask the same questions of ourselves we ask of our students? Do we reflect and take action on new insights and understandings? Do we offer ongoing opportunities for students to engage in research around issues that matter to them and the world?

Since we can't give to others what we don't own ourselves, we have come to believe we need to carefully monitor our own beliefs and practices. To do so we recommend:

- "Read" your room by analyzing artifacts and room arrangement to uncover the beliefs you convey. Are you sending messages you intend to send? Validate those you wish to own and revise those you don't.
- Audio- or videotape various segments of your day. Invite a colleague to collaborate with you to interpret your actions. We find a two-column form helpful. On the left-hand column we document exactly what the teacher says or does. Then next to each action we infer a belief that action might convey. In other words, we document the beliefs our actions reflect. By doing so over time, you can identify patterns in your belief system.
- Think about beliefs you embrace but struggle to implement or those that are absent from your daily routines and rituals. Select a belief to work on for a month or so. It takes time to truly live into new beliefs, so give yourself the time, energy, and support you need to identify and enact this new belief. Once you feel the belief has become a habit of your heart and mind, begin the process anew. It's a challenge at first, but once you deliberately experience the process, it's truly generative.

If you are interested in engaging your students as researchers in the same ways the featured teachers did in this piece, we recommend:

- Audiotape segments of an independent reading conference. Before offering advice from your teacher perspective, rewind and play the recording for your reader. Ask her what she noticed about herself as a

marine biologist who studies the effect of climate change on organisms in the intertidal zone along the Oregon coast. While there, they lived and learned alongside scientists as they collected authentic data that would be used for real reasons. Dr. Helmuth emphasized the importance of careful, systematic data collection because their data would contribute to the international knowledge base on climate change.

Apprenticing under Dr. Helmuth and his colleagues helped Scott, one of the CFI 4th- and 5th-grade teachers, appreciate the value of *purpose* and *investment*; understanding the purpose of the work naturally fostered investment. This made the Oregon experience rich and meaningful. As a result of this experience, Scott reenvisioned the role of purpose and investment in his curriculum. He recognized the need for his students to better understand

why they collect and interpret data to promote genuine investment in their work.

This new belief led Scott to include citizen science projects in his curriculum. Since collecting data for real reasons made such an impact on his learning about climate change, Scott believed citizen science projects would give his students first-hand opportunities to engage in genuine research that would impact the greater good. Students would see the purpose of what they were doing and thus become more invested in their work because their data would be used to further scientific inquiry in the world.

### Introducing Students to “Real” Research

The first time Scott engaged students in citizen science projects, the class focused on collecting data for the USA National Phenology Network

reader. Then build your conversation about the reading process and what she is doing as a reader from her perceptions. Think about it as an innovation on retrospective miscue analysis.

- Share a recording of a reader from another class with your students or a small group. As the kids listen, invite them to code or document their noticings on copies of the text. Talk together about what reading is and what strategic readers do by theorizing from practice. As you discuss what your young reading researchers notice, you can co-construct a vision of the reading process and then invite them to study themselves as readers.
- Invite students to pose and investigate real problems they care about in the world for social studies and science units. Think about involving your class in citizen science projects as well.

Scaffold students as they adopt a critical stance and learn to pose questions like:

- *Who developed the idea, invention, or concept?*
- *Why was the idea or invention created? What was the purpose of the invention given the context and culture of the time period?*
- *Where did the knowledge or information presented in the materials we are reading in this unit of study come from? Can we trust or believe it? Do we need to access multiple sources to triangulate our knowledge or understanding?*
- *Have common knowledge, beliefs, or understandings about this topic changed over time? What led to shifts in our beliefs or understandings?*
- *Why does this knowledge or information matter to me?*
- *How has what I have learned during this unit changed me?*
- *Why does the knowledge I’m learning in this unit of study matter in the world?*
- *So what? Now what? How might we take action on what we have learned during this unit of study?*

Most important, trust your kids, trust the process, and trust yourself as a teacher. Enjoy!

(www.usanpn.org). Phenology is the study of how seasonal changes affect plants and animals from year to year, such as the idea that the timing of a plant's flowering affects the emergence of insects and the migration of birds. His kids observed two trees—a cloned dogwood tree and a persimmon tree. Students recorded specific observations created by the USA National Phenology Network. Their daily observations included noting emerging leaf buds, leaves and increasing leaf size, the coloring of leaves, falling leaves, flowers or flower buds, open flowers, fruits and when they ripen, and drop fruit. These observations were recorded on forms provided by the USA National Phenology Network and entered into their classroom account located on the website. From there, data were compared across the area to see if regional changes are taking place possibly due to climate change.

While all of the students were initially excited about this project, the excitement began to wane for many over time. Scott's students understood

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the purpose of what they were doing, yet they became bogged down in the incidentals of long-term data collection. They struggled to maintain a shared data collection schedule. Since data collection was divided among all class members, individual students made infrequent observations and often forgot when it

was their turn to observe. Ultimately, they lost their focus, momentum, and investment in collecting and recording data, and after several months of data collection, only two students were maintaining the daily observations.

Still, Scott felt it was worthwhile for his students to engage in citizen science work. It was authentic and offered kids a chance to contribute to the larger scientific knowledge base. Scott reflected on the dilemma he encountered with the whole-class project and realized *choice* was a critical missing piece.

## Seeing Citizen Science Work Anew: The Power of Choice and Ownership

At the beginning of the next school year, Scott's class spent a week researching citizen science projects. Students recorded the name of the website, what the project entailed, and how data should be collected and inputted. After they created the list of potential projects, they explored the feasibility of each one. Some projects required participants to collect data on organisms unavailable to our region or collect data at times outside of the school schedule. They narrowed their list to these choices:

- CoCoRaHS—[www.cocorahs.org](http://www.cocorahs.org)
- Project Noah—[www.projectnoah.org](http://www.projectnoah.org)
- Project Squirrel—[www.projectsquirrel.org](http://www.projectsquirrel.org)
- Notes from Nature—[www.notesfromnature.org](http://www.notesfromnature.org)
- The Wild Lab Bird—[bird.thewildlab.org](http://bird.thewildlab.org)
- Ancient Lives Project—[www.ancientlives.org](http://www.ancientlives.org)

Each student then made a commitment to the project s/he found most personally compelling. The kids placed themselves in groups to share responsibilities. Small groups allowed the kids to mentor one another and engage in collaborative inquiry by discussing their noticings, altering data collection to fit their individual needs, and changing their data collection schedule based on challenges faced in the real world. In addition, iPad minis were introduced to the group several months into the school year, making it possible to take advantage of the apps that many citizen science project organizations have developed to make data input easier. Students input data directly into the citizen science app; they also documented data by taking pictures and uploading them to their accounts (see Fig. 7).

Scott noted the kids' processes paralleled those he had experienced when working alongside scientists in Oregon. Since choice was introduced into the citizen science projects, Scott's students were definitely more invested in their data collection—so much so that many kids collected data at home and shared new findings during class sharing time. However, though they saw the value of their intentional and systematic efforts for themselves



**Figure 7.** Students input data into iPad minis to document their observations.

and recognized their personal contribution to our world, they—just like scientists in the real world—struggled with focus and interest in long-term data collection initiatives.

Overall, Scott noted shifts in their beliefs about climate change and a conscious caring for Earth in their talk during small-group inquiries. With shifts in beliefs come shifts in action, both in and outside of the classroom. It is our hope and dream that these young scientists will take their learning home by making moves to further understand and care for the planet for years to come.

### Teacher Inquiry as Professional Development

At the Center for Inquiry, we are fortunate to live and learn in a supportive environment that invites us to persistently ask questions, gather data, and create new understandings from which to interrogate our beliefs and practices through weekly conversations (Mills, 2001). However, before coming to the Center, the majority of our faculty members spent years teaching in contexts that were more likely to offer staff development in the form of training for mandated programs than through opportunities for true professional development. When lacking the institutional support they needed, these teachers did what so many teachers across the country do each and every day—they created their own opportunities

to engage in teacher inquiry alongside their students and colleagues.

### Professional Acts of Inquiry

Before joining the staff at the Center for Inquiry five years ago, second-grade teacher Chris Hass encountered tension when he realized his beliefs about teaching and learning were outgrowing his instructional practices. Attending conferences and reading professional texts introduced him to an exciting new thought collective exponentially larger than any he had encountered when exposed only to his own grade-level team, school, and district. However, the energy he felt for the development of his new understandings was quickly counterbalanced by an uncertainty as to how these would manifest themselves in his daily teaching.

Once he recognized that the course of his teaching had diverged from the accepted and supported practices of his current teaching context, his first act of inquiry was to seek out others who felt similar conflicts in their teaching. Within a few weeks, he had aligned himself with like-minded educators to create a teacher study group. Just as Tim and his students co-constructed knowledge about the reading process by analyzing their parents' data set, Chris and this small group of teachers came together weekly to co-construct new knowledge about teaching by analyzing professional texts, classroom stories, and student artifacts. Placing their own teaching at the center of this work, they engaged in professional reflexivity—studying themselves to outgrow themselves (Mills & Donnelly, 2001). The growth they experienced in their teaching lives as a product of authentic research reflected the same growth they were working to help their students realize through inquiry-based studies.

The following school year, Chris moved to a new district. Inspired by Smith and Peterson's (2004) notion that artists are far more likely than

*It is our hope and dream that these young scientists will take their learning home by making moves to further understand and care for the planet for years to come.*

teachers to frequent spaces where they can imagine new possibilities for their work (Mills, O’Keefe, & Jennings, 2004), Chris began inviting himself into the classrooms of his new colleagues to observe how others were working to support, inspire, and challenge their students as readers, writers, mathematicians, scientists, social scientists, and community members. Just as Tim’s students sat in the school cafeteria poised to collect and record data about food waste on clipboards, Chris sat and collected notes on classroom environment, student engagement, and instructional methodologies. Each observation he made became one more piece of data

to critique while interrogating his own teaching practices and beliefs.

Because he wanted to learn from his kids the same way that he learned from colleagues, Chris also engaged in teacher research within his own classroom. Teacher research calls for us to identify questions from the tensions in our teaching, then collect and analyze data to locate answers (Shagoury & Power, 2012). Noticing their students had become complacent with exploration time, a part of the day set aside to pursue individual interests, Chris and his student teacher, Nozsa, spent a few weeks observing their kids and each other during this part of the

## INTO THE CLASSROOM WITH READWRITETHINK

### Authentic Inquiry

The following resources from ReadWriteThink.org further illustrate strategies and resources described in the article:

#### *How to Encourage Higher Order Thinking*

Practicing Higher Order Thinking (HOT) skills outside of school will give kids the tools that they need to understand, infer, connect, categorize, synthesize, evaluate, and apply the information they know to find solutions to new and existing problems.

<http://www.readwritethink.org/parent-afterschool-resources/tips-howtos/encourage-higher-order-thinking-30624.html>

#### *Making the Reading Process Visible through Performance Assessment*

Effective differentiation begins with purposeful assessment. In this strategy guide, you’ll learn how to construct an authentic performance-based reading assessment that will give you access to students’ thinking before, during, and after reading.

<http://www.readwritethink.org/professional-development/strategy-guides/making-reading-process-visible-30961.html>

#### *Weather Detectives: Questioning the Fact and Folklore of Weather Sayings*

Students adopt a skeptical stance and become weather detectives who ask “Why?” and “Why not?” as they investigate the history and validity of some common weather sayings.

<http://www.readwritethink.org/classroom-resources/lesson-plans/weather-detectives-questioning-fact-775.html>

#### *Finding Solutions to Food Waste: Persuasion in a Digital World*

Using various reading strategies and resources, students investigate the issue of food waste. They also create persuasive arguments and blog posts examining this topic.

<http://www.readwritethink.org/classroom-resources/lesson-plans/finding-solutions-food-waste-30950.html>

—Lisa Fink  
ReadWriteThink.org

day. Just as Scott's students had firsthand opportunities to engage in genuine research around citizen science that would impact a greater good for the Earth, Chris and Nozsa engaged in genuine research around their teaching that would impact a greater good for their students' learning. Each day they discussed their observations, invited their students into conversations about what they were noticing, and theorized from the patterns that emerged. Chris and Nozsa developed new plans for their teaching during exploration that reflected what they had come to learn from their students through teacher research.

### Seeing Professional Development Anew

Returning to our latest curricular epiphany—the *process that propels our professional growth parallels the process that promotes growth and change in our students' beliefs and practices*—we see that professional inquiries into our own teaching, much like the work of our students around reading, food waste, and citizen science projects, help us to imagine new possibilities. This, in turn, allows us the opportunity to work at the edge of what learning can be.

As Chris, Tim, and Scott work alongside their kids to inquire into their worlds, each understands that to position their students as creators of knowledge, they must first make certain this is a stance they are enacting in their own lives. It is not enough to wait for someone else to tell us what to do or what to learn. We must work collaboratively, accessing those around us who are more knowledgeable or have similar questions. We must move outside our own comfort zone to see how the rest of the world is living. We must take a step back and analyze what we observe around us in order to refine and expand upon our previous beliefs. Thus, we work to support ourselves and our colleagues in the same ways we work to support our students—fostering genuine inquiry carried out by inspired, strategic, and self-motivated learners.

### On Changing Hearts, Minds, and Actions

Time and time again, we have witnessed the power of collaborative inquiry. We are always delighted but never surprised when kids make contributions

that far exceed our initial vision of their potential. It's what makes teaching and learning fresh and compelling. It's why responsive teaching makes so much sense. It's at the heart of cultures of inquiry.

Although our teachers work in a school culture where children are invited to engage in research and expected to construct and share knowledge with others, their beliefs and practices can be transferred and transformed to diverse settings and student populations. You see, all kids have the propensity to live and learn as researchers. Humans are wired to seek patterns. Humans are wired to inquire. Kids engage in research outside of school when learning to play a new instrument or sport, inventing new tools to solve everyday problems in their lives, categorizing card, rock, and car collections and so on. As classroom teachers, we simply need to harness our students' passion, energy, and capacity to live and learn as researchers by inviting them into inquiries that grow out of our curricular goals.

It's a common practice for elementary teachers to ask their students to study and report on an animal of their choice. These days that often means "Googling" the animal and creating a list of facts or writing an informational piece about the animal and/or its habitat. We have learned, however, that we can make such assignments better reflect authentic, rigorous learning outside of school. We do so by asking students to choose an animal they can observe in their own backyard or community before turning to a secondary source. We teach them how to carefully document observations of their animal over time. Then, after writing descriptions of their animal and noticing behavior patterns, the students pose questions. At that point, they read to learn with questions in mind. It's how zoologists work, and it's how kids can, too.

The same planning process works in the social sciences. In our first-grade classrooms, we invite students to learn about the past and their local

***It is not enough to wait for someone else to tell us what to do or what to learn. We must work collaboratively, accessing those around us who are more knowledgeable or have similar questions.***

communities by accessing family or community members as experts. Grandparent projects require students to interview a family member or significant elder, then interpret pertinent historical artifacts. The children compile the stories and artifacts into a photo album or book they share with their classmates during their grandparent project presentations. The projects become family keepsakes after the children explore commonalities and differences in their family histories. When kids can connect history to their culture and family, the learning lasts.

We can transform our typical units of study with guiding questions that will help us plan to make learning in school more closely reflect learning in the world. To support the transformation, Mills (2014) identifies the following questions:

- What read-alouds might I use to show kids what research looks, sounds, and feels like in the world, to give them a vision of genuine inquiry?
- What are the essential science and social studies concepts in my standards?
- What professions use them in real life? What tools and strategies do these professions use?
- What kinds of experiences might I provide in the classroom that mirror learning in the field?
- What kinds of high-quality nonfiction reading and writing experiences might be embedded authentically into my required units of study?

Many students come to us with solid learning identities and a strong sense of agency. Others come with instructional histories that require us to remind them of their potential. To do so, it helps to launch the year by helping kids learn how to identify, investigate, and solve a critical problem that matters in their lives. When planning, it is important to devote as much time to teaching them *how* to learn as *what* to learn. In the beginning, students benefit when universal processes are initially taught and practiced together through a whole-class inquiry (Mills, 2014):

- How to carefully observe the world using the tools and strategies of the discipline
- How to pose questions and investigate/solve problems from numerous perspectives

- How to access primary and secondary sources in complementary ways
- How to use the language of inquiry and disciplines to learn and communicate new understandings
- How to use reflection to grow and change

It is important to scaffold students into an investigation of an issue they can actually impact so they will see for themselves how research findings can lead to social action. Sometimes kids' initial questions are too complex, large, or distant. When this happens, we scaffold students into locating a related question that is both worthy of investigation and feasible. Questions about world hunger can be daunting, yet students can seek to understand and work to resolve hunger in their local communities or minimize food waste in the cafeteria, as Tim's third graders demonstrated.

Although it is impossible for students to truly investigate a conflict on the other side of the world, they can ask compelling questions and explore conflict resolution strategies in their classroom, school, or after-school care program. These modifications make it possible to situate initial research projects around topics that are meaningful to them within their classroom, school, or local community. When issues emerge that kids care about, we seize the opportunity to teach children how to use research to understand and resolve problems in the world. "For us to have agency, we have to believe that things are changeable, because if they can't be changed, taking action is futile" (Johnston, 2012, p. 27). Service learning projects have grown in popularity across the country for just this reason.

By offering our students the opportunity to pose, investigate, and solve problems, we liberate ourselves as teachers and our students as researchers (Freire, 1970). The teachers featured in this piece illuminated how their students co-constructed knowledge, shared insights, and posed questions around reading strategies, food waste in the school cafeteria, and climate change. But they did so much more than learn new content. The kids became more sophisticated, strategic readers, healthier and less wasteful eaters, and better caretakers of the Earth. We've learned to

inspire our students to change their hearts, minds, and actions by beginning with our own.

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**Heidi Mills** is Hungerpiller Professor in the Department of Instruction and Teacher Education at the University of South Carolina, and the Curriculum, Research, and Development Specialist at the Center for Inquiry in Columbia, SC. She can be reached at [Heidimills@sc.rr.com](mailto:Heidimills@sc.rr.com). **Tim O'Keefe** was one of the founding members of the Center for Inquiry where he teaches second and third graders; he can be reached at [tokeefe@richland2.org](mailto:tokeefe@richland2.org). **Chris Hass** teaches second and third graders at the Center for Inquiry and is a doctoral student at the University of South Carolina. He can be reached at [chass@richland2.org](mailto:chass@richland2.org). **Scott Johnson** teaches fourth and fifth graders at the Center for Inquiry and is a doctoral candidate at the University of South Carolina. He can be reached at [scjohnson@richland2.org](mailto:scjohnson@richland2.org). All ideas and findings in this article represent the perspective of the authors and do not necessarily represent the position of Richland School District Two or the University of South Carolina.

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