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Changing Mindsets About Classroom Assessment

A group of middle school science teachers and a university researcher recount some of their experiences as they individually and collectively worked toward improving their everyday assessment practices to better support student learning.

Everyday classroom assessment has the unleashed potential to help students improve their performance and deepen their learning. With much public and political attention focusing on summative assessments of what students know and are able to do at benchmark years through state testing programs, relatively little attention has been given to the formative assessment that takes place in the day-to-day interactions between teacher and students and among students. In their review of hundreds of empirical studies of classroom-based assessment, Black and Wiliam (1998) concluded that formative assessment practices are an important and significant contributor to improving student achievement and learning. But how can teachers begin to grapple with their own everyday assessment practices and bring greater attention to using assessment to support learning? This paper describes how a group of middle school science teachers working with a team of researchers from Stanford University in the Classroom Assessment Project to Improve Teaching and Learning (CAPITAL) began to rethink the purposes of assessment and how to use assessment information in their classrooms. The teacher co-authors recount some of their experiences as they individually and collectively worked through a process of change toward improving their everyday assessment practices to better support student learning. Additional findings from CAPITAL have been summarized elsewhere (Atkin et al., 2005; Coffey et al., 2005; Sato et al., 2005). The following experience described by Tracey summarizes a shift in her thinking in the purposes of assessment in her practice.

A Changed View of the Purposes of Classroom Assessment: Tracey's Experience

I just returned from the California Science Teacher's Association (CSTA) Convention. After reflecting on my experience at the convention, I realized I viewed the event through my changed assessment eyes. The summative aspects of assessment have always been clear to me—grading students' work, giving tests at the end of a unit, assigning culminating projects—as a way to know if my students "got it" after all the teaching and instruction were done. I have come to see assessment in my teaching practices as serving a new kind of purpose. The formative side of assessment keeps me focused not only on what students learned after I have taught them, but also on how I can support students' learning while I am teaching them.

While on the train to the convention, two teachers recognized my conference materials and paper grading and joined me for a chat. We exchanged pleasantries as we all graded papers. I was grading an end of unit test. This was the first "traditionally" graded feedback my students would get this school year and it was already the end of October. This assignment was preceded by several topic-specific "questions of the day" that I had stamped when completed and students had corrected; quizzes that had been self-assessed by the students using class examples that showed varied degrees of understanding of the concepts; and a project that had been self, peer, and teacher assessed using a checklist of criteria, then revised and reworked until the criteria for the project had been met by the students. The tests I was scoring showed that the majority of students had met the criteria and they demonstrated understanding of the science standards on which we had focused.

My fellow train riders were not so

pleased with their students' efforts. One mumbled about his students' lack of effort, the other about a colleague who allowed open book tests, and both lamented the lack of parent support for their students' success. Both of them were grading the student work without giving comments to the students. One of the teachers marked the incorrect labels on a skeleton diagram. As I watched this practice, I asked myself, "Will that red mark correct the misnamed bone for the student? What would the marks on the paper and the grade on the top do for the student? Would the student study his mistakes?"

As I asked myself these questions, I realized that I had once marked papers similarly to how I was observing these teachers on the train mark their students' papers. I assigned work, collected it, marked it, and handed it back. What had all of this work on my part, as the teacher, really done for the students? The questions I now asked myself were much less about why the students didn't "get it" after I had laboriously taught them and checked their work. I wondered about how the assignments given to students could be supported with feedback and suggestions for revision that would help students make progress in their understanding and skill development.

As I attended workshops throughout the conference my questions about learning goals and methods of supporting students toward those goals through formative assessment were unleashed. I attended a session about building classroom habitats, since caring for classroom animals and plants appealed to me. The ideas presented in the workshop centered on managing students and materials in cooperative groups. I was struck by how little attention was given to what the students might learn from the activities involving the living animals and plants. The absence of content or learning goals in the workshop conversation felt like a huge gaping hole to me. In my conversations with colleagues, we have come to begin our conversations with what it is we want the students to learn through the activities and experiences we plan in our classrooms.

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The presenter brought up peer assessment briefly and this caught my attention. He discussed peer assessment as a process of one student grading another student using an A, B, or C grade; a grade lower than a C should not be given in order to protect students' self esteem according to this presenter. Inside me, the questions bubbled up: "What criteria do the students use to assess one another? What does meeting the criteria look like? Can the students revise their work after the peer assessment? Why do students have to give each other grades? Will the students have an opportunity to discuss their work with one another during the peer review process? How is this peer assessment different from the teacher assigning a grade to the work? Will the students really be fooled by the grading scale that ends at C?" The assessment focus of my questions brought up not only issues of how I would know that my students "got it," but also helped me think about how my instruction could be designed to support the learning while I was teaching.

CAPITAL: An Action Approach to Changing Classroom Practices

The group of teachers co-authoring this paper are from the New Haven Unified School District in Union City, California. They are one group from among the twenty-five teachers who participated in CAPITAL during its four years of National Science Foundation support (NSF Grant REC-9909370). CAPITAL staff and this group of teachers worked together during the 2000-2002 school years, meeting regularly to discuss their current and changing assessment practices through a process of collaborative action research. Teachers used CAPITAL meetings to share classroom practices they were trying and to delve into the underlying reasons guiding their choices. The university staff introduced research findings and ideas from other teachers into the conversations, raised questions for the group or an individual to consider, and participated in the discussions.

Several aspects of classroom-based assessment influenced the work of CAPITAL. Substantial research suggests that greater student learning and higher task performance are achieved by providing task-oriented feedback to students (Butler, 1987; Crooks, 1988), eliciting information from students through assignments and discussion as a means of gauging where students are in their progress toward a goal (Duschl & Gitomer, 1997), and providing opportunities for students to peer- or self-assess their work prior to submitting it for teacher evaluation

(Schunk, 1996). Research on learning also suggests that understanding is strengthened when the learner is asked to take an active part in determining what he or she understands and how he or she came to that understanding through reflection and metacognitive opportunities through talk and writing (National Research Council, 2000; Palincsar & Brown, 1984; Scardamalia, Bereiter, & Steinbach, 1984; White & Frederiksen, 1998).

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CAPITAL viewed teachers as practitioners who employ practical reasoning, or reasoning directed toward taking principled action, in their professional work (Gauthier, 1963; Schon, 1983). The university staff did not approach the work with teachers as a process of reporting research findings and expecting the teachers to employ specific strategies or techniques in their classrooms. As a group of researchers and teachers working together, we explored how the assessment practices instituted in the classrooms made sense for the differing needs of the students and aligned with the priorities of the teacher-as-person and the context in which the teachers worked. Within the group from New Haven Unified School District, all five teachers expressed fundamental shifts in both their practice and their mindsets about the role that assessment played in their classrooms. The three experiences described below provide illustrative examples of some of the changes in assessment practice and changes in beliefs about assessment. The reader should also note how the teachers describe the dynamic interaction between their actions and beliefs.

Knowing What My Students Are Thinking: Vicki's Experience

Almost every day, I want to know how my students are doing and what they are thinking. One method I use to gather this information from my students is the "question of the day." The question of the day is a question that I put on the board every day and it is meant to either get my students thinking about the concept I am about to teach or to review a concept we have learned the day before.

When it was first introduced to me as a new teacher as a behavior control technique, the purpose was to get students on task as soon as they walked in the classroom door and to provide me with some quiet time to take attendance; the substance of the question or what I would do with the student responses was not discussed. I found the technique useful to some degree at first, but I eventually stopped using it because the questions took too much time out of our very short class periods.

Many years later, I have now started using question of the day again, and I use it for quite a different purpose than classroom management. I choose the questions very carefully so that they are integral to what we are learning in class. I take the time to walk around the room, giving feedback to every student in the class on their answers. Feedback might include comments such as:

> "Good job. Can you help Sean? He seems to be struggling a bit."
> "You calculated the number right, but what units are you using there?"
> "I think I know what you're trying to say, but I am not getting that from your sentence. Try rephrasing it."
> "That's a really creative answer. Would you write that on the board to share with the class?"

I find that the more I use this technique, the better I get at writing good questions and at picking apart the concepts that trouble the students. As an example, in a recent unit on forces for eighth grade, we did a very simple lab using a spring scale to pull a single book across a table, followed by pulling two stacked books across the same table, then three books, and so on. We graphed the data and found that we got a straight line of best fit. The next day, I drew the same graph on the board for the question of the day and wrote: "What does this graph tell you?" I was unpleasantly surprised by the responses.

> "That it is a graph of force and books."
> "That force moved the books"
> "That you need force to move books."

Very few students articulated that the graph meant that the greater the number of books, the greater the force needed to move them. And no one explained that the graph, with its linear relationship, meant that we can determine the force needed to pull any number of books. While I did not expect to see the second idea articulated, I did expect to see the first. I think I would have missed this

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aspect of the students' understanding if I had not done a question of the day. But now that I knew what the students were thinking, I made a mental note to give at least one more linear graphing opportunity before the unit test. I said to many students, "Well, yes, it is a graph of books and force, but what happens when you add more books?" The problem that I had not anticipated was the use of the word force as used in *Star Wars*: "The force moved the books." That informed my next question of the day, which was, "What's wrong with this sentence?: 'Force moved that chair.'" Before my work with CAPITAL, the students would have completed the lab and I would have expected them to tell me what a graph of force versus books meant on the unit test. With the immediate assessment opportunity that the question of the day offered, I created learning opportunities for my students to interpret a graph thoroughly and to develop a better understanding of the idea of force.

Informing My Instruction: Joni's Experience

I think that I am now giving clearer expectations about learning and creating an equal opportunity for all students to be successful. For me, I have begun to see and use assessment as an integral part of my instruction. I used to think of assessment as something that followed instruction:

instruction → assessment (grading)

I now see it more like a cycle in which assessment outcomes drive my instruction, followed by more assessment:

instruction → assessment → teacher reflection on student learning → instruction → assessment

A recent example from my classroom involved the design of an inquiry-based lab on light using light boxes, prisms, and lenses. Over three days, students investigated the various properties of light. While the students worked with the materials at their lab tables, I was able to walk around and talk with them about their conceptions of light. I frequently encountered misconceptions that we addressed on the spot, I answered the students' questions, and I gave verbal feedback on what I thought they might try next to further their understanding. With the information I gleaned from my one-on-one interactions with the students and lab groups, I used the whole class discussion period to address and clarify some information about the behavior of light and how some of the equipment worked. As a class, we then formulated further questions for investigation.

I am using more analysis of student work to influence my instruction. I see assessment as a tool for me to adjust my instruction and to help students set directions for their learning, and not just as a measure of learning after instruction is completed. From this new perspective on assessment, I now also see that if the instruction is not meaningful and rich, the assessment will not be as reflective of the students' needs. For example, I do not think I would have learned as much about my students' understanding of light if the work they were doing was based on completing a worksheet from the textbook materials. Because of this, I find that I really question my choice of activities and assignments for the students. I ask myself, "How is this assignment meeting the content standards? What do I want my students to learn? What are the key elements that will demonstrate understanding?" I want the opportunity to see and hear them thinking so I really am selective about what I choose to do with them during class time now. I am clear in my mind about the purpose and expected outcomes of the assignment before I ever write a lesson plan.

Evaluating Student Projects: Elaine's Experience

When I assign projects now, I hand out two sheets. The first one gives a clear explanation or instructions for the project. The second sheet is a self-assessment check off sheet. This sheet has everything I am aiming for and looking for in the project. If the student has satisfied all these requirements on his or her paper, he or she will have earned an "A". The self-assessment tool gives the student the opportunity to self-assess the project before giving it to me. The student then knows where he or she stands with regard to the criteria and can revise whatever needs to be revised. In terms of the final evaluation of a student's work, if a student turns in a project that does not yet meet the criteria set out for the project, that student still has the opportunity to make the corrections, turn it in, and still earn full credit, or an "A".

I explained this assessment and grading system of projects being acceptable (i.e., they meet all the criteria) or unacceptable (i.e., the project needs revision) to parents at Back to School Night and they loved it. So far I have not gotten any complaints about fairness from parents. This acceptable/not acceptable practice has made grading a lot quicker and easier for me. I do not labor over borderline decisions about whether a project merits a "B-" or a "C" grade. I no longer feel bad thinking that Joe made a simple error and now it is too late for him to earn a higher grade or that Maria shows little understanding of an idea and it is too late for her to revisit it because the projects are all submitted. It is not too late for either of them. Joe can still make corrections after he knows what needs to be fixed and he fixes it. Maria can still get a tutorial from me or a classmate and further develop her understanding. In other words, everyone still has the opportunity to learn and meet the goals.

My colleagues in CAPITAL first started this assessment practice and I must admit that, in the beginning, I was reluctant to grade projects on an acceptable / not acceptable basis. I felt that it would not be fair to those students who completed their work accurately and on time to allow other students who needed to make corrections to earn the same grade. In our group discussions about this practice, the focus of the assessment of projects was also shifting more toward the demonstration of the concepts and skills and less on the aesthetic quality of the work. I had difficulty justifying giving a student who turned in an elaborate project that demonstrated much effort and time spent the same grade as a student who turned in a project that appeared to be done quickly with less attention to the overall appearance of the work. I feared that this new assessment approach would not provide the incentive to students to do the high quality work that some of my high achieving students produced, knowing that their grades would be based solely on the scientific concepts and skills and less on appearance.

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Now I look at it differently. I began to ask myself what it was that I really valued when I assigned and evaluated student work. I have come to the conclusion that, for me, the value lies in what the students have learned. It does not matter that some students take longer and others are quick learners or some are better at aesthetically expressing themselves than others. Of course, I still require my students to turn their work in on time and since I have instituted these revision opportunities into my practice, the on-time turn in rate has been very high—even for the students who do not regularly turn in their work. I think this was due to the fact that the students knew they had to have their work prepared for the due date in order to be eligible for the revision time. They seem more willing to revise their work knowing that the possibility of earning an "A" for demonstrating their understanding is still there. The main thing is they learn the science concepts and skills we are focused on in class and this is what I now think of as the center of my assessment practices. If they demonstrate their understanding or abilities at any time, they have met the goals of the class and earned that "A". It took me a while to accept that last statement. But through lots of conversations with my colleagues and slowly trying new ideas, I am now finding that this is working for my students and for me. I even heard myself suggesting this assessment approach to a new teacher at an assessment workshop we recently held in our school.

Changing Mindsets About Classroom Assessment

For all five teachers, the general shift in thinking about assessment was toward making learning goals and expectations more clear to the students and shifting from an emphasis on grading student work after it is completed and submitted to an emphasis on providing immediate feedback that supports the students while working toward the learning goals. Vicki summarized this shift: "the most valuable thing we can do to help with our students' learning is to really *be there* in class, giving as much feedback as we can directly to the students to support them as they engage in the learning of new concepts and skills."

All of the teachers instituted the strategy of assessing projects using an "acceptable / unacceptable" format as described by Elaine. As this approach to assessing projects spread throughout the group, each teacher made modifications to tailor the approach to his or her own practice. In the group conversations, the teachers described this assessment approach as one in which feedback to the students was more consistent because the standards and criteria for the work were more clear and focused on the essential

conceptual understandings expected of students. Joni strongly felt that the revision process afforded by the acceptable / not acceptable assessment strategy provided a more equitable opportunity for learning for all of her students:

> I have leveled the learning field. At my school, I have many students who have special learning needs, students who might not get it the first or second time. This process allows those students to keep trying until I know they understand the concepts better. I have gotten some of the biggest rewards of my teaching career by seeing the looks of pride and smiles that come over the faces of students who had revised time after time and finally got it! The biggest benefit is that I have few students who do not complete projects. Since the emphasis is on learning and the goal is an "A" for accepted, everyone has an equal opportunity to achieve success.

From the discussions about assessment strategies that are focused on learning, the teachers' mindsets about their role as the teacher shifted. The conversations among the teachers began with a fundamental desire to reduce the amount of paperwork they felt they had to maintain to be fair and consistent in calculating grades for students. The teachers felt trapped in a cycle of collecting homework and projects, grading assignments with the primary goal of recording a score in their grade book, and returning the marked papers to the students in a timely manner (which, given that each of the teachers is in contact with approximately 180 students every day, this was not always possible). As the teachers' conversations turned to discussing ways to make expectations clearer to students and their appreciation grew for what information they could glean about a student's understanding through daily interactions, some of the teachers began to play a different role in their classrooms. The management of paper and grade spreadsheets is a responsibility, but the amount of time spent on these activities has been greatly reduced in favor of time spent designing meaningful projects with clear standards, daily interactions with students in both one-on-one and whole-class discussions centered on formative assessment, and on creating more opportunities for peer feedback and self assessment.

As we open the door for students to turn a failure into a success, we must allow our peers a comfortable environment to do the same.

This group has also engaged their colleagues in conversation about what they have learned in the examination of their own practices. These efforts to influence change in others, though, present their own challenges, as described by Neil below.

Challenges in Changing Practices: Neil's Experience

My CAPITAL peers and I have been trying to figure out how to address some of the assessment issues we have learned about in our own classrooms with other teachers in our district in a way that does not sound like we are suggesting that they have been doing it wrong all these years. Many lunchtime conversations have proven how difficult it is to tread these waters. The quick wall of, "No, that won't work for me" often pops up at any mention of the successes we have experienced in our own classrooms. One teacher we work with is very caring and concerned about his students. He gets very involved in the success of his students as shown in their grades. When his students fail, he looks for interventions for the students, but does not look at his own teaching or assessment practices. He searches for the difficulty the student might have as an individual or at home, but he does not view his role as actively guiding the student toward successful learning. When planning together, I am often confronted with his resistance to thinking about how formative assessment might make a difference in what he understands about his students' performance and understanding.

After a year and half of talking about assessment related issues and sharing some of my new practices during our ongoing planning time together, I have seen a slow, steady progression moving him from his teacher-centered approach to his starting to look at what the students are learning. He saw our excitement and results, and began to feel his way into the processes that got us there. A year ago, he was not ready to adopt completely a new way of thinking about assessment as it relates to student learning. Now, there is a willingness to talk about new ideas and tailor some for his own classroom.

In contrast, during one of our many lunchtime conversations about out teaching another teacher became interested in our group's conversation about the acceptable / unacceptable assessment practices. She asked some questions about how it worked and the advantages that we saw. That was all it took. A week later, she was sharing

her own students' successes with the process. She went from conversation to successful implementation without any further prodding or discussion. She saw the benefits and fit it into her practice without any hesitation.

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Why was the second teacher so easy to convince while the others are so difficult? As I ponder this I am forced to believe that classroom practices are the adult equivalent of our students' work. They need to be open for revision and teachers need to know that it is okay to admit that their work needs revision. As we open the door for students to turn a failure into a success, we must allow our peers a comfortable environment to do the same. I think the key to this is realizing that as our kids have individual learning needs, teachers do too. We all have buttons we do not like pushed and closets we want to keep closed. We need to foster an environment at the school sites where trying new practices in the classroom is acceptable, open for discussion, and an expected way for teachers to get better at what they do. We also need to provide opportunities for teachers to collaborate with each other on a regular basis. One of the ways that teachers have to make sense of their everyday activities in their classrooms is to talk with their colleagues about what is going on. We found the collaboration part of our work with CAPITAL to be an essential part of our learning.

CAPITAL: A Collaborative Approach to Changing Classroom Practice

As stated earlier, CAPITAL was guided by the theoretical perspectives of practical reasoning with the teacher as the primary driver of the choice of action and decision in the classroom. Deliberation is the essential process of practical reasoning, requiring the person who acts to size up the situation and view it with both the desired outcome and the appropriate means toward that outcome in mind (Schwab, 1969). The collaborative process of sharing ideas, receiving feedback from colleagues, and reflecting on practice and underlying beliefs with peers was a central design feature of CAPITAL that enabled the teachers to deliberate with their peers as they engaged in the process of making changes in their daily classroom practices. CAPITAL staff intended that the group conversations would provide opportunities for the teachers to learn not only from their own practice, but also from the practice of their colleagues (Wenger, 1998).

The teachers from New Haven felt strongly that the collaboration in which they engaged was a central feature of their change process. However, they point out that collaboration is not something that they knew how "to do" simply by virtue of being a teacher. When given the time and opportunity to work with their peers, the teachers pointed out what is often left unasked in teacher collaborations.

> Sharing ideas and building lessons together is really great, but no one ever asks, "How do we know this lesson will be effective?" In fact, the very question would probably be seen as insulting. How dare we question each other's effectiveness as teachers? The question would probably have been met with, "We'll find out when we give the test, I guess."

The group pointed to the importance of having a facilitator for their initial collaborative conversations for several purposes. The facilitator kept the group focused and on track and provided a process for the discussions. More importantly, from the group's perspective, the facilitator asked probing questions and encouraged the teachers to see these questions as models for questions they could ask one another. The group also described how the facilitator helped them pause on issues that they might have left unexamined.

> For example, someone might say, while discussing a lesson, "Of course, I can't talk to every student about their grade." We, the teachers, probably would have let the statement go, waiting instead to hear more about the lesson itself. One of the facilitator's jobs is to listen for such statements and revisit them. So, the facilitator might say, "You said you can't talk to every student about his or her grade. How do you decide who to talk to? How does everyone else know about their grades?" Some of our most interesting discussions came out of statements that we revisited through probing by the facilitator.

With the opportunity to not only deeply think about their practice and to talk about it with trusted colleagues,

When given the time and opportunity to work with their peers, the teachers pointed out what is often left unasked in teacher collaborations.

this group asked each other those typically unasked questions. They became more comfortable and adept at probing each other on the underlying reasons for their practical choices.

CAPITAL set out to help teachers bring about changes in their everyday assessment practices and to learn about everyday assessment from these teachers' classroom work. The fundamental shifts in understanding the purposes of assessment expressed by the teachers were catalyzed by actions they took to change their practice and those actions further informed the teachers' beliefs about the purpose and use of assessment information. The collaborative process of exchanging ideas, seeking reasons for actions, and exploring alternative strategies helped these teachers make sense of their change process and further clarify their own underlying beliefs and assumptions about the purpose of assessment in their classrooms.

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