

# Continuous Assessment and Professional Growth **6**

*"My standards for professional development have changed. If I am truly going to implement new strategies in my classroom, then I need the time and commitment to discuss my progress with other professionals, receive feedback on my attempts thus far, and plan my next steps. My learning takes place over time and requires reflection and support. My classroom experiences in science and assessment support my professional development."*

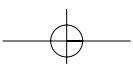
—Elementary Teacher

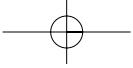
*"The type of professional development that happens with this type of assessment is an inquiry into itself. You are asking questions of the practice, you are getting data, you are then saying hopefully to some colleagues, 'are you noticing this too,' and I just think that changes the whole arena of professional development."*

—Senior Consultant

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**T**hus far you've been reading about various aspects of continuous assessment—the context in which it takes place, what it might look like, tools and techniques, how to analyze the data, and so on. In this chapter we describe continuous assessment from the point of view of professional development. We focus on the type of professional development you gain by reflecting on your practice on your own and/or with a group of peers, and what you might look for in a more formal setting such as a course or an institute. These topics, along with a professional development vignette from our own work, help bring this important issue alive.





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Educators at all levels are redefining the character and role of professional development in schools. Research supports the vision of the professional development context as one in which teachers work with one another and with their own students in learning communities. As you read this chapter and plan ways to incorporate continuous assessment into your practice, you may want to consider the professional development that will best support your own and your students' growth.

### CONTINUOUS ASSESSMENT AS PROFESSIONAL DEVELOPMENT

Just as you use students' everyday experiences as the basis for improving and tracking their development, your everyday classroom experiences can become an important vehicle for your own professional growth. As you strive to better understand and guide students' learning, you will find yourself reflecting on your teaching strategies and how they impact that learning. You might ask yourself, "What can I do to encourage students to plan their investigations more carefully?" or "What experiences can I provide for students to challenge their misconceptions?"

As explained in Chapter 4, you can analyze the assessment data you gather (about students) through this lens of personal, professional growth. Here are some suggestions:

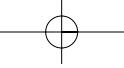
- Watch video clips or listen to audiotapes with particular questions about your teaching in mind (e.g., lines of questioning, interactions with different students, your role in discussions, how the lesson models inquiry).

*"I feel that there is so much I need to learn more about inquiry science but I'm willing to just take the chances and learn as I go and let it become a growth process for me."*

—Fifth-Grade Teacher

- Review a videotape or audiotape (or read a transcription) of a class discussion to analyze your facilitation skills. Did your interventions help to open or unintentionally close discussion? Did you feed students information and directions, or did you ask productive questions to spark their thinking? Were there times you didn't intervene when you should have (e.g., when the discussion moved to unrelated topics)? How might you improve your facilitation skills?

- Ask a colleague to visit your classroom, watch a video, listen to an audiotape with you, or just listen to you as you relate the day's activities, and share



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his or her impressions or comment on particular issues about your teaching you want to address. What ideas does he or she have for refining your practice?

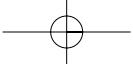
*"My team teacher, Susan, comes in and videotapes three times a year. Then we sit down and look at the videotape together, and talk about what's happening. I have certain ideas that might need somebody else to kind of juggle around and say, 'Well, did you think of looking at it this way?' Susan has really helped me to do that."*

—Kindergarten Teacher

- Review your observation notes from several class sessions and determine how useful they are to you. Are you recording enough detail? Too much? Do your notes reflect pure observations or interpretations? Do notes from several days ago still make sense? Are you learning what you had hoped from your notes about students' progress toward learning goals? Would a different documentation tool give you more accurate or complete information? Perhaps a digital photograph might help in capturing a certain classroom moment and the actions of a student or group of students.
- Watch a video clip to become more aware of your actions and movement around the room. For instance, do you sit with or stand over students? How much time do you spend interacting with students about their learning compared with time spent gathering materials and keeping students on task?
- Review student journal entries. Is there variety in your journal assignments (e.g., asking students to respond to a question, draw a diagram, write a letter to a younger child explaining a concept)? Are you learning what you had expected from students' entries? Do you write back to your students? Do different assignments provide you with different information? Do different students respond better to different assignments?

*"My experiences with continuous assessment—with the encouragement to practice classroom research, peer sharing sessions and inquiry—has been my most significant professional development experience in twenty-plus years of teaching. It is so rewarding to work with other professionals who are asking questions about the practices of teaching and assessment; and, more so, who seek solutions. By actually keying in on what was happening in the classroom, I became more motivated to be a better teacher. The process became more than just teaching. My experiences have instilled the drive to discover the best teaching and to implement it."*

—Elementary Teacher



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### Reflecting, Analyzing, and Learning With Colleagues

*"What I'm hungry for are more sessions where a group of teachers is experimenting, reporting out to each other, and relating stories and questions from our own up-to-the-minute, red-hot science time with kids."*

—Elementary Teacher

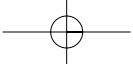
While it is helpful to analyze your teaching and your students' development on your own, another very effective forum for reflection is with other teachers who are also implementing inquiry and using formative assessment practices. The support and feedback that you'll give to each other is invaluable and key to the personalized growth that comes from this type of professional development. Consider how you might create some of these opportunities for reflecting with colleagues in your unique context:

- If there are other teachers in your school interested in science inquiry and/or continuous assessment, consider setting up or joining a study group around a specific topic. The group might share classroom experiences, analyze student work, discuss readings, and so on. In her outstanding book, *Using Data/Getting Results: A Practical Guide for School Improvement in Mathematics and Science*, Nancy Love includes two "Data Tools" that your group might use as a first step in establishing guidelines by which you can examine and reflect on student work (Love, 2002, pp. 376-377). These guidelines are known as "protocols" and may help to give your support group a helpful structure with which you can best reflect on students and their work as well as on teaching practices.
- If you team teach, consider setting aside time to plan, review student work, and reflect on science experiences with your team members.

*"You've heard of the old adage that two heads are better than one? This was especially true as my team teacher and I supported each other in our attempts to sort out and collect different types of evidence that yes, indeed, showed we had good science learning going on in our classrooms. In some ways it's great to have somebody who doesn't know your kids, because her ideas are very different. She'll say, 'Oh, but you know what though? They got to it here!' And I would have missed that if I had been the only person listening."*

—Second-Grade Teacher

- Consider using release time to co-teach or observe in another classroom. Ask a colleague to provide some coaching around a particular problem or teaching practice. For instance, he or she might observe you facilitating a



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science session, then share observations on your questioning strategies and their impact on students.

- If you are working with a professional development provider, ask for direct classroom support. This might mean mentoring or coaching, co-teaching a session, co-planning a unit, or finding appropriate materials.

*“The opportunity to share experiences with my peers as well as to assist them in their own inquiries has given validity to what we all are doing.”*

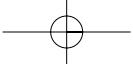
—Elementary Teacher

### Support From Professional Development Standards

As you look both within and beyond the classroom for ways to grow in your understanding of and facility with continuous assessment, you might want to review the findings about effective professional growth published by national education organizations. Gaining this knowledge can inspire you to learn about inquiry and assessment, be it for science or any other discipline. You will find this knowledge helpful when seeking support from administrators, parents, and colleagues. You will seek (and demand!) professional development opportunities that include elements of these standards. Take a minute to review the *National Science Education Standards* (NSES) followed by a description of a model of our own professional development experience. In these examples, you will find that the kind of ongoing professional development that occurs when you use continuous assessment is consistent with what is advocated by experts in the field (Figure 6.1).

#### **National Science Education Standards**

In 1996, the National Academy of Sciences, working with leading national science education organizations, published the *National Science Education Standards*. This publication features a chapter titled, “Standards for Professional Development for Teachers of Science.” Although these standards are primarily intended to inform anyone who provides professional development, teachers are urged to use the standards as criteria for selecting and designing activities for their own professional growth. In Figure 6.1, the professional development standards are expressed on a “less emphasis, more emphasis” continuum. We have added a third column with short descriptors of practices that are consistent with continuous assessment *and* supportive of the professional development standards for science teachers (see Resource B, Table B.6, “NSES: Changing Emphases for Professional Development”).

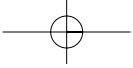


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**Figure 6.1**

<b>National Science Education Standards for Professional Development &amp; Descriptors of Professional Growth Opportunities when used with Continuous Assessment</b>		
<b>Less Emphasis On . . .</b>	<b>More Emphasis On . . .</b>	<b>Professional Growth with CA</b>
Transmission of teaching knowledge and skills by lectures	Inquiry into teaching and learning	<i>The classroom as the site for collecting data used to drive your professional growth</i>
Learning science by lecture and reading	Learning science through investigation and inquiry	<i>Learning science through investigation and reflection on continuous assessment data</i>
Separation of science and teaching knowledge	Integration of science and teaching knowledge	<i>Integration of science, inquiry, and teaching knowledge and practices via continuous assessment</i>
Separation of theory and practice	Integration of theory and practice in school settings	<i>Integration of theory and practice informed by continuous assessment data</i>
Individual learning	Collegial and collaborative learning	<i>Collegial and collaborative learning among teachers and students through review of continuous assessment data</i>
Fragmented, one-shot sessions	Long-term coherent plans	<i>Long-term planning for practicing and learning from inquiry and assessment</i>
Courses and workshops	A variety of professional development activities	<i>Using classroom practice and continuous assessment to guide choices for individual professional development in science</i>
Reliance on external expertise	Mix of internal and external expertise	<i>Mix, with emphasis on internal expertise developed through reflection on continuous assessment data individually and with colleagues</i>
Staff developers as educators	Staff developers as facilitators, consultants, and planners	<i>Staff developers as co-inquirers, facilitators, consultants</i>
Teacher as technician	Teacher as intellectual, reflective practitioner	<i>Teacher as reflective practitioner who uses classroom data to improve practice and student learning</i>
Teacher as consumer of knowledge about teaching	Teacher as producer of knowledge about teaching	<i>Teacher as producer and sharer of practice-based knowledge about teaching emerging from continuous assessment</i>
Teacher as follower	Teacher as leader	<i>Teacher as professional developer for self and others</i>
Teacher as individual based in a classroom	Teacher as a member of a collegial professional community	<i>Teacher as member of local collegial group focused on learning through continuous assessment</i>

Source: Reprinted with permission from the *National Science Education Standards*, copyright 1996 by the National Academy of Sciences. Courtesy of the National Academies Press, Washington, D.C.



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### AN EXAMPLE OF EFFECTIVE PROFESSIONAL DEVELOPMENT

An elementary school (K-8 of approximately 600 students) decided to engage its faculty in an effort to improve science teaching and learning. In April, our team met with the science task force, including the assistant principal and twelve classroom teachers. A lively discussion took place about the kind of professional development that would be appropriate for the school. *"This first meeting is what we call the pre-institute mode, in which teachers and administrators become active participants in the planning. When we work with them instead of coming in and doing a program for them, we create a more positive and collaborative learning environment. The teachers have a real investment,"* says Project Director Maura Carlson.

The model we agreed on included a four-day institute at the beginning of summer and two follow-up days at the end of August just before school started up again. The program would continue throughout the school year with three scheduled after-school inservice programs and 10 days set aside for visits to the teachers in their classrooms or during a planning period.

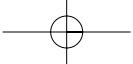
Sixteen teachers as well as the principal and assistant principal were involved in the project. "Over the years, we have found that having the principal, and in this case the assistant principal as well, involved makes an important statement about the importance of science in the school," Maura says. "The teachers see their administrators working with us, and feel supported as the science initiative unfolds. The result is greater success all around, as things take hold in the schools."

#### ***The Institute***

This initiative was guided by our beliefs that for teachers to feel comfortable teaching inquiry-based science and conducting continuous assessment, they first need to experience inquiry for themselves as adult learners, understand the concepts of the science they are teaching, see continuous assessment modeled, and have the opportunity to practice and to reflect on their integration of inquiry and assessment in their classrooms with support from mentors and peers.

These goals become the basis for the "strands" of the institute. The "Inquiry Strand" takes teachers at their current level of experience and introduces learning science through an inquiry-based approach. Teachers raise questions within the context of a concept area (in this case the science of "fluids: water and air"), and plan and carry out an investigation to help answer their questions. The findings resulting from their investigations are shared. With input from their peers and the support of the facilitators, these teachers are able to make sense of the concept.

Running concurrently with the "Inquiry Strand" is the "Continuous Assessment Strand." In the continuous assessment strand, facilitators model the use of formative assessment strategies and tools to observe and gather data regarding each teacher's progress in his or her inquiries. The facilitators then use those data to offer immediate feedback, to plan for the next lesson, or to make



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adjustments in their own teaching practices. In other words, they model what they hope teachers will do when they are teaching their students. They also make transparent and explicit exactly what they are modeling. Participants are given time to ask questions about both the science concepts and practices they are learning as well as the methods that the professional developers are using as they teach.

The science topic under investigation by the teachers is the heart of the third strand, the “Content Strand.” In this strand, teachers use their investigation findings, along with the information provided by the facilitators and the assisting scientist, to further understand the concepts of the current topic.

The “Sustained Support Strand” continues throughout the school year. As the school year approaches, we challenge participants to consider how they might apply these new strategies of science education in their classrooms. We are also a continuous resource for the participants, offering follow-up meetings and on-site support throughout the school year. We gladly co-teach in their classrooms if asked. We even provide a professional development newsletter to broadcast “how it’s going” to participants and to the rest of the school staff and parents.

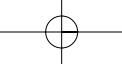
### ***Our Approach***

The approach for each institute is based on trust and respect for teachers’ ideas and input. By starting off this way, our center team models our own beliefs and principles about teaching, learning, and assessment as we invite the teachers to become involved in their own inquiry as adult learners. We listen to teachers’ ideas, just as a teacher would listen to students’ ideas, and we model assessment strategies and tools just as they will use these strategies and tools with their own students. *“Many teachers at the elementary level have a degree of fear associated with learning and teaching science,” says Maura. “Yet, they are already experienced teachers. They know how to look around a classroom and recognize good reading or math skills, but with science it can be more challenging, because many often don’t know what to look for as indicators of quality science. Our job is to help them experience being a scientist, to develop with them indicators of what they would see and expect their students to be learning and doing, and to provide tools and strategies for documenting and using assessment data.”*

As teachers experience inquiry for themselves as learners, see continuous assessment modeled, and deepen their own content knowledge, they begin to consider what they’d like to bring back to their own classrooms. They have more confidence in what science learning and teaching can be and what to look for as they assess student progress. *“This confidence puts our teachers at ease, and the students can sense that,” says Maura.*

### ***Planning and Reflecting at the August Follow-Up***

The next important step in the process is planning and reflecting. Here the teachers change hats from student to teacher, and spend time integrating inquiry



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and continuous assessment into their curriculum for the next year. “We try to make a distinction between when we are talking with the teachers as learners, and when we are talking with them as teachers for their students,” says Maura. “So throughout the institute we were making a point of them learning for themselves. Now that we’ve completed the initial work, we tell them it’s now time to think about their students’ learning.” Some of the questions we started with included things like: What science do you want to start with this year? What aspect of inquiry and formative assessment intrigues you enough to try it out this fall? What kind of support can we give you?

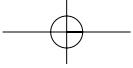
We encourage the teachers to focus on the first unit they are going to teach, and what assessment tool they would use to gather information. Some of the participants want assistance in gathering materials and background information. Other teachers are preparing units on topics like “light” or “the desert” and want ideas about how to integrate inquiry and assessment with these topics. For example, a teacher who was developing a unit on the desert worked with Maura to come up with investigations on heating and measuring the temperature of sand as compared to something more stable, like water. *“I often tell the teachers that you can take a recipe activity like making a heat detector, and add a little twist to make it more inquiry-oriented.”*

### ***Our Continuing Relationship With the School***

In a way, this institute was just the beginning of a longer-term relationship between our Center for Science Education and Professional Development and the elementary school. Over the following year, we visited the school regularly, and worked with the teachers both individually and in groups as they slowly integrated continuous assessment into their teaching. We also had three large-group follow-up sessions of three hours each. *“This isn’t something that you just learn and that’s the end of it,”* says Maura. *“What happens is that teachers start with one inquiry or continuous assessment tool and try that out. Once they’re comfortable with that, they add another. So the key thing is that we continue to support them over time so that when their challenges come up, we are there to help.”*

## **PROFESSIONAL DEVELOPMENT RECOMMENDATIONS**

Students cannot achieve high levels of learning and performance unless teachers, principals, and other school employees are continuously learning. Staff development not only includes high-quality, ongoing training with intensive follow-up and support, but also other growth-promoting processes such as study groups, action research, and peer coaching, to name a few. (National Staff Development Council, n.d.)



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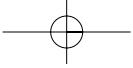
The following recommendations summarize what effective professional development in science inquiry and continuous assessment can look like. Some of the ideas apply to your classroom learning and others to off-site professional development experiences. Refer to these reminders as you reflect on and advocate for your own professional growth, and as you consider new professional experiences. If you are a professional development provider, you might want to read through these suggestions and compare them to your practices and your beliefs about teaching and supporting teachers.

- Use your daily classroom experiences to learn about your students' thinking and abilities and the impact of your teaching strategies. Use the formative assessment data you gather to help you advance student learning and improve your own teaching practices.
- Seek opportunities to engage in content-rich inquiry as an adult learner and to see continuous assessment modeled.
- Reflect on what you most value in teaching and learning. Explore how these core beliefs align with national and local teaching and learning standards, and how they clarify a vision to drive your instruction.
- Seek professional development opportunities that provide long-term support. Look for experiences that allow you to pursue in-depth, compelling questions about science teaching, learning, and assessment with sustained support over time.
- Seek opportunities to collaborate, explore new ideas, and share experiences and dilemmas with colleagues. These collaborations can inspire and support your professional growth.
- Build administrative support by sharing your experience of the benefits of classroom-based professional development.

## CONTEXT FOR PROFESSIONAL DEVELOPMENT

Professional development can take many forms, depending on the needs of the educator. To support lasting changes in teacher practice, we advocate sustained professional development in a variety of contexts. The contexts range from your own classroom as a site for professional development, to teacher peer groups and workshop experiences with providers who model the national standards for teaching and professional development. Here are some other examples of such contexts:

- An early awareness meeting with teachers, science committees, and administrators to help identify issues that need to be addressed to support a comprehensive and successful implementation of a K-12 science program.



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- A one- or two-day session in which participants engage in the initial stages of a cycle of inquiry, see formative assessment modeled, and consider the types of support they might need to go further.
- A multiday local institute for teachers, during which participants experience a full cycle of inquiry as adult learners, see continuous assessment modeled, and increase their knowledge of a particular content/concept area such as motion, light, fluids.
- Support sessions over time for institute participants with meetings, classroom visits, and phone, e-mail and Web site conversations. Participants share successes and challenges in implementing inquiry and assessment in their work and receive feedback, support, ideas, and resources from peers and professional development providers.

*"Practicing continuous assessment as my own professional development addresses both student learning and my adult learning and thinking. Through reflecting on how I approach my own learning, discussing connections to pedagogy with other peers, and continuing to value and learn science content, I get a much fuller and more useful experience than with most other so-called 'inservice' models."*

—Elementary Teacher

*"... it's formative assessment, but it's formative assessment of the teacher enabling the students to change their practice. But it's also the teacher being able to reflect on what pedagogical changes she's had to make in order to change the practice of the student, so they are doing this dance together back and forth over time."*

—Doris Ash, Staff Member,  
Institute for Inquiry, the Exploratorium

