

Two (Complementary & Research-Based) Views of Good Professional Development

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Characteristics of Effective Professional Development in Mathematics and Science

(from Garet *et al* 2001).

The six aspects of teachers' professional development that emerged as extremely important in affecting teacher learning are:

- *Form*. Traditional classes, workshops or a "hands-on" activity like mentoring were less effective than reform types of activities, such as teacher networks or study groups.
- *Duration*. Longer professional development programs are more likely to make an impact. Sustained and intensive programs are better than shorter ones.
- *Collective participation*. Activities designed for teachers in the same school, grade or subject are better than professional development programs that do not target groups of teachers who work together.
- *Content*. Professional development courses that focus on how to teach but also on what to teach—the substance and subject matter—are key.
 - Elementary schoolteachers especially may have taken fewer courses in science or math and may be less familiar with the subject matter, the researchers note.
- *Active learning*. This aspect is fostered through observing and being observed teaching, planning for classroom implementation, reviewing student work, and presenting, leading and writing.
- *Coherence*. Teachers need to perceive professional development as part of coherent programs of teacher learning and development that support other activities at their schools, such as the adoption of new standards or textbooks.

What Components Do Quality Programs Have in Common?

(From Kaser & Bourexis with Loukes-Horsely & Raizen, 1999)

Across all types of programs analyzed (teacher development, teacher research, student enrichment and systemic):

- *Program Administration*: A quality program has a clear set of program goals that are understood by participants, program staff, directors, sponsors, and communities. A quality program has some in charge and reporting lines are clear. Different individuals from throughout the community have input into the program's design and operations and are kept informed of progress.
- *Program Evaluation*: A quality program takes evaluation seriously and builds it into the program design. Evaluation performs three functions. First, evaluation monitors that key program activities occur as planned or depart from the plan with good reason. Second, it assesses how well the program is operating *during* the program and provides information to sponsors, directors and staff to reflect on performance and to make appropriate changes. Third, it investigates and determines the outcomes of the program on a regular basis, not just at its conclusion. The program design and operation change over time on the basis of evaluation information. In all cases, the program evaluation looks to compare performance against benchmarks and expected outcomes as defined by the program's vision and goals.
- *Follow-up*: Perhaps a better term than *follow-up* is *follow-through* – as in following through on a baseball swing or throw. Quality programs are not designed as discrete events, but rather as continuous interventions toward a goal. Quality programs include follow-up activities,

structured activities that take place as part of program design following the first major events for the purpose of continuing and enhancing the goals of the programs. Follow-up is an often neglected component of program designs, sabotaging the effectiveness of even the most well planned event.

- *Unique Contribution of Host Organization:* Quality science and mathematics programs of the types investigated here all operate within host organizations with specialized capabilities and resources, and these are an integral part of the programs. Participants in quality programs have extensive opportunities to interact with the wealth of technical and human resources available through the host organization. Organization staff both work directly with participants and serve as consultants.
- *Systemic Connections:* Quality programs do not operate in isolation. They operate as part of program portfolios intended to improve science and mathematics education, whether in schools, districts or the broader community. Quality programs are always part of larger efforts connected through common vision and goals, similar activities, and ongoing networking and communication.

Unique Components of Quality Teacher Development Programs:

- *Vision for the Teacher's Classroom:* Quality teacher development programs are driven by a vision of the kinds of science and mathematics programs teachers should use with their students. A program's goals and objectives address this vision. Currently, thorough descriptions of classroom instruction in the standards are published by the National Council of Teachers of Mathematics, the National Research Council of the National Academy of Sciences and the American Association for the Advancement of Science. Classroom instruction focuses on students' deep understanding of major science and mathematics concepts or principles, and development of skills and habits of mind. Quality programs model authentic assessment, the kind of assessment of student learning that measures important learning outcomes, such as understanding principles and process skills, rather than those that are easy to measure – facts and vocabulary.
- *Nature of Program Activities:* A quality teacher development program is reflexive; that is, it reflects in its own activities just what it envisions and advocates that teachers do with their students. Teachers, just like students, are actively involved in “doing” mathematics and science during the program. They are not listening to lectures or watching experts conduct demonstrations on a regular basis, although at times these activities may occur during a 3- or 4-week program. What the teachers experience meets their interests and needs and can be transferred to easily to their classrooms. They work together in groups, practice new knowledge and skills, and have the support needed to make changes in their classroom on their return.
- *Teacher Leadership and Responsibility:* Expectations that teachers will demonstrate leadership and assume future responsibilities for sharing what they have learned is an explicit part of quality teacher development programs. Teacher leadership and responsibility includes teachers influencing their own learning experiences, applying their new knowledge and skills, sharing information with their colleagues, and networking with people outside the program.

Garet, M., Porter, A., Desimone, L., Birman, B., & Yoon, K. (2001). What makes professional development effective: Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915-945.

Kaser, J.; Bourexis, P.; Loucks-Horsley, S.; Raizen, S. (1999). Enhancing program quality in science and mathematics. Thousand Oaks, Calif., Corwin Press.