Workshop 6:
Fostering Effective Professional Development for Teachers

PRINCIPLE: Principal Catalyst

FOCUS QUESTION: What kind of professional development for math and science teachers will really make a difference?

Principals weigh a variety of professional development strategies that are based on the idea of collaboration and reflection. Teachers work together to help each other improve their practice in teaching math and science.

Preparatory Readings

We suggest that you read the following articles, included in the Appendix at the back of this Guide, prior to viewing Workshop 6:

"Building Professional Community in Schools" (Kruse, Seasore, and Bryk)
"Enabling Professional Development—What have we learned?" (Lieberman and Miller)

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Video Clips

Barbara Alcala—Staff Development

"Peer-to-Peer professional development"

Math Department Chair, Barbara Alcala at Whittier High School in Whittier, CA, describes how she encouraged two math teachers to lead a staff meeting about how to use white boards—dry-erase tablets that are large enough for a cooperative group of four or five students to use together, but small enough to be easily managed in the classroom. Teachers brainstorm their ideas for how they could use white boards to enhance group work in math. They provide each other with constructive criticism for applying these ideas to the classroom and leave not only with a set of white boards and markers to take back to their students, but a list of ideas from their peers.

Nancy Love

"Interview"

Thoughts from author and education researcher Nancy Love about several principles she believes are important for professional development for math and science teachers.

Wendy Shapiro/Deborah Bambino—CFG's for Teachers

"Critical Friends Groups and changing practice"

Eight-grade science teacher Deborah Bambino teaches at Central East Middle School in Philadelphia, an urban school under the current leadership of principal Wendy Shapiro. Deborah presents a lesson about mixing cold and warm air masses that is part of a new curriculum she is piloting. Immediately after school she presents the activity to her Critical Friends Group, a cross-disciplinary group of educators who meet regularly to examine each others' practice and provide feedback. After hearing their comments, Deborah returns to the classroom the next day and makes changes in the lesson for a new group of students.

Al Castillo/Adam Hernandez—Whittier High School

"Peer observations and mentoring in changing practice"

At Whittier High School in Whittier, CA, Principal Al Castillo and lead teachers Kirsten Leoniak and Dina Leslie helped start a peer mentoring program. Together, Al and three teachers from different disciplines observe a math class taught by Adam Hernandez. Later, Adam receives feedback from his peers, followed by a one-on-one meeting with the principal.

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Research Data

Seven Principles of Effective Professional Development in Math and Science
Nancy Love

1. Based on a vision of effective student learning.
2. Helps teachers develop knowledge and skills ("pedagogical content knowledge).
3. Mirrors the methods to be used for students.
4. Helps to build a learning community.
5. Supports teacher leadership.
6. Connected to other parts of the system.
7. Is continually assessed.

Strategies for Working in a Collaborative Culture
Guidelines for Principals

- Understand the culture.
- Value your teachers: promote their professional growth.
- Extend what you value.
- Express what you value.
- Promote collaboration.
- Make menus, not mandates.
- Use bureaucratic means to facilitate, not to constrain.
- Connect with the wider environment.

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Discussion Questions

(remember to choose a Structure from those listed on pages 12 to 14)

- How can the principal provide the time and resources for adequate professional development for teachers?
- Who should lead math and science professional development? Why?
- Do peer coaching models really work? Why? Why not?
- How can I assess the need for professional development in my school?
- What is the most effective professional development strategy you've used?
- When do you lead professional development and when do others?
- How do you use staff meeting time and other existing structures?
- What are ways to give teachers the big picture so that they can make informed decisions about professional development?
- Is it sufficient to work only with math and science teachers or should/can all teachers be involved?
- How can the principal promote the value of changing math and science education in the school?
- If teachers learn well collaboratively in groups, should those groups be across disciplines or should math and science teachers be separate?

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Web Sites

AAAS' Project 2061 Professional Development Program. Internet Address: http://project2061.aaas.org/Pdp/challeng.html

Association for Supervision and Curriculum Development. Internet Address: http://www.ascd.org/

Education Week. Internet Address: http://www.edweek.org/context/topics/profdev.htm

Eisenhower National Clearinghouse Professional Development site. Internet Address: http://www.enc.org/reform/ideas/133273/index.htm

Fostering High Quality Program. Internet Address: http://www.project2061.aaas.org/newsinfo/earlychild/fostering/copleyp.htm

Professional Development Consortium for Mathematics Teachers. Internet Address: http://mtl.math.uiuc.edu/what is mtl.htm

Teaching Smart (Science, Math and Related Technology.) Internet Address: http://teachingsmart.org/description.html

Other Sources

Cognitively Guided Instruction Project. Directed by Elizabeth Fennema and Thomas P. Carpenter, U of Wisconsin at Madison, Madison, WI

Colorado College Integrated Science Teacher Enhancement Project (CC-ISTEP). Paul Kuerbis, Project Director, Colorado Springs, CO 719- 389-6147.

Global Systems Science (GSS). Lawrence Hall of Science, Berkeley, CA: 510-642-9635.

National Staff Development Council (NSDC), for information on professional development in peer coaching and mentoring. Oxford. OH: 513-523-6029.