Collaboration for Colleagueship: A Program in Support of Teachers

Working mathematicians are reaching across organizational boundaries to help make mathematics teaching less isolated, more intellectually invigorating.

Like Saturn's rings, unprofessional working conditions, which teachers confront daily, consist of thousands of tiny grains of dust that appear solid from a distance but that seem to dissolve into pettiness when one moves close enough to initiate change. Isolation in classrooms, lack of even modest resources to use according to one's professional judgment, scarcity of time for extended conversations with colleagues, no permanent study space or access to a telephone, no capacity to delegate administrative details: these are the grains of dust. Taken collectively, they form an impenetrable barrier to professionalism.

The problem of unprofessional working conditions has been treated in the literature, most notably in the pages of this journal over the past few years, in Ted Sizer's *Horace's Compromise* and John Goodlad's *A Place Called School*, and in a variety of research articles. Considerable evidence indicates that teachers as a group receive as much satisfaction from intrinsic rewards as from extrinsic ones, and poor working conditions clearly contribute to the diminution of intrinsic rewards. A recent Harris poll found that after salary complaints, the main sources of job dissatisfaction among teachers were poor working conditions (41 percent), lack of student discipline and motivation (31 percent), lack of professional development opportunities (28 percent), and lack of support from administrators (25 percent).
percent); lack of administrative support (25 percent); lack of respect (25 percent); boredom, frustration, burnout, and stress (22 percent).

The problem of unprofessional working conditions has as an integral part of its solution the development of collaboration among teachers and other like-minded professionals in a community. That is, while collaboration among businesses, universities, and school systems may provide students with new opportunities and schools with new resources, increased acquaintance and collegueship for teachers is usually regarded as a by-product of these collaborations. Professional isolation and lack of parity with other professionals in a community, however, can be eliminated only by extending the range of professionals who work together on projects and tasks of mutual interest.

**Building Community through Collaboratives**

The Ford Foundation was mindful of these issues when it embarked a year ago on a project to assist a number of cities to develop "mathematics collaboratives"—groups of mathematically minded professionals in a city joined together by bonds of colleagueship. This program is small in the overall scheme of things, experimental, and constrained to a particular domain that is of programmatic concern to the foundation: improvement of mathematics teaching in inner-city schools. But it is meant to shed light on some elements of the broader issue of professional working conditions for teachers. It attempts to create conditions of colleagueship for teachers with other mathematics-using professionals in a city—by supporting collaborative activities of mathematicians from high schools, higher education institutions, and private industries and thus encouraging the entry of teachers into a larger mathematics community.

The foundation has made grants in seven cities (Philadelphia, Cleveland, Minneapolis, Pittsburgh, Durham, San Francisco, and Los Angeles) in partial support of mathematics collaboratives serving those cities' high school mathematics teachers. Collaboratives in five additional cities are in their final planning stages, thus completing the projected set of 12. Each collaborative will receive foundation funding for three to five years. Their primary goal is to work with mathematics teachers to determine the conditions under which the teachers would be less isolated from the larger mathematics-using community, more intellectually stimulated, and in a position to participate actively in efforts to improve mathematics education in their schools. Their task then is to create these conditions as much as possible.

- In Los Angeles, the mathematics departments of three high schools have joined with associates from businesses and higher education to identify important projects to improve the mathematics programs in their schools, to identify necessary resources in the community, and to make changes. Joint planning and program development among teachers in a mathematics department and with their business and university associates is the hallmark of this project.

- In Cleveland, high school mathematics teachers have had intense summer exposure, through internships in industry and workshops in industrial retraining centers, to the changing industrial profile of the city and the consequent changes in needed skills for students. Minigrants and a mathematics resource center will provide resources for teachers to use in adapting their schools' mathematics programs to the new environment; their new colleagues from industry will help. Out of this partnership, new and unpredictable additional projects may grow.

- In Minneapolis and St. Paul, an intensive problem-solving seminar in which teachers worked with university mathematicians on complex mathematics problems has renewed teachers' interest in mathematics itself as well as confidence in themselves as mathematicians and teachers. A Twin Cities Mathematics Society of school, university, and industrial mathematicians meets regularly to discuss interesting topics in mathematics.

- In San Francisco, mathematics teachers worked with physicists at The Exploratorium, renewing their sense of the power of mathematical modeling to explain physical systems. During the school year they expect to work with physics teaching colleagues on joint projects. The opportunity to develop topics in other scientific disciplines is on the agenda for the future.

Regardless of the mathematics theme that the collaborative has chosen for its initial focus, in each case working mathematicians and mathematics educators from schools, colleges, and universities, communities colleges, industries, banks, science museums, and so forth are reaching across organizational boundaries to find mathematical and educational interests in common.

The foundation's program bears a family resemblance to several other networking programs for teachers that have been developed in the past few years: Academic Alliances directed by Claire Gaudiani of the University of Pennsylvania; The Bay Area Mathematics Program directed by Elizabeth Stage of the Lawrence Hall of Science at Berkeley; and the several teacher network projects funded in recent months by the National Science Foundation. It differs from these in offering year-round activity for a substantial portion of a school system's high school mathematics teachers, thereby concentrating resources and energy in a synergistic way.

**Program Resources and Replicability**

Though they vary in the details, the pilot collaboratives are not costly and have been built largely of components available in many cities—a school year...
work best 7 Thus the local projects are Working Lives of Teachers
The outcomes of such an extended
the program elements that seem to
ers in these collaboratives attending
not merely developing pilot programs
in their own cities but are also contrib
sage system, a minigrant program for
and to plan, to learn;
resources—often modest, only a
few hundred dollars—but adminis
tered in such a way as to provide
autonomy for teachers;
3. colleagueship with others of like

The development of mathematics
This implies that mathematics collabora
tives have been functioning, three elements have emerged that appear to be central for the development of a professional milieu for teachers:
1. time for teachers to think, to
learn;
2. resources—often modest, only a
few hundred dollars—but adminis
tered in such a way as to provide

The project does not deal
directly with such issues as desks and
tables, it constitutes a field experi
ent into the conditions under
which mathematics teaching and, by
implication, the teaching of other sub
jects could become a more intellec
tually invigorating, less isolated en
deavor. As each group of teachers in
each city works to make the collabora
tive function well for them, we will all
learn more about what modifications
need to be made in the daily life of

1. I am indebted to Mary Potter Rowe of
MIT for the image of Saturn's rings.
2. Recent articles in Educational Leader
ship that treat the problem of unprofes
sional working conditions for teachers in
clude: Linda Darling-Hammond and Arthur
E. Wise, "Teaching Standards or Standard
ized Teaching?", Vol. 41 (October 1983): 2,

66, Arthur E. Wise and Linda Darling-Ham
mond, "Teacher Evaluation and Teacher
Professionalism," Vol. 42 (December 1984/
January 1985) 4, 28; Carl D. Glickman,
"The Supervisor's Challenge: Changing the
Teacher's Work Environment," Vol. 42
(December 1984/January 1985), 38; Dale
Mann, "Impact II and the Problem of Staff
Development," Vol. 42 (December 1984/
January 1985): 44.
3. See Mark C. Schug, "Teacher Burnout
and Professionalism," Issues in Education
1, Nos. 2 and 3 (1983) for a review of the
literature on this topic.
4. The second "Metropolitan Life Survey of
the American Teachers," conducted by Louis
Harris & Associates, Inc. As reported in
Education Week, September 18, 1985, p. 6.
5. The organizations that are conducting the
development of mathematics collabora
tives in these cities are:
6. Philadelphia: The Franklin Institute
(ProjeC Director, Wayne Ransorn), 20th
and The Parkway, Philadelphia, PA 19103.
7. Cleveland: The Cleveland Education
Fund (ProjeC Director, Paula Anderson).
1400 Hanna Building, Cleveland, OH
44115.
8. Minneapolis: School of Mathematics,
University of Minnesota (Project Director,
Harvey Keynes), 127 Vincent Hall, 206
Church St., S.E., Minneapolis, MN 55455.
9. Pittsburgh: Allegheny Conference on
Community Development (ProjeC Director,
Leslie Salmon-Cox), 600 Grant St., Pitts
burgh, PA 15219.
10. Durham: The North Carolina School of
Science and Mathematics (Project Director,
J. Keith Brown), P.O. Box 2418, West Club
Blvd. and Broad St., Durham, NC 27705.
11. San Francisco: San Francisco Educa
tion Fund (Project Director, Gladys
Thacher), 1095 Market St., Suite 719, San
Francisco, CA 94103.
12. Los Angeles: The Los Angeles Educa
tional Partnership (Project Director, Peggy
Funkhouser), 1052 W. Sixth St., Suite 716,
Los Angeles, CA 90017.
13. Project Director: Mark Driscoll, Educa
tion Development Center, Inc., 55 Chapel
St., Newton, MA 02160.
14. Project Director: Thomas A. Romberg,
Department of Curriculum and Supervi
sion, University of Wisconsin-Madison, 225
N. Mills St., Madison, WI 53706.

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