

Who's Teaching Whom? Scientist/Teacher Teams and Administrative Strategies

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Abstract: As one of the research university teams participating in the National Science Foundation (NSF) GK-12 Fellowship Program*, site educators and scientists are realizing collaborative, technology-rich learning environments that have implications for teacher development, administrative planning for technology and curriculum, and the professional growth of young scientists. Scientist fellows in biology, chemistry, mathematics, computer and information science are strategically partnering with high school teachers and administrators, integrating the use of problem-based learning (PBL), scientific visualization, and informatics in science and mathematics education. Initial data thus collected by the GK-12 Evaluation Team of six teams at four sites across Illinois offer context and contrast in professional development, support, planning, and implementation. This paper addresses the evolving collaborations between administration strategists, the science and mathematics teachers, and scientist-fellows at these sites and the implications for success.

**The EdGRID GK12 Fellowship Program supports annual teaching fellowships for graduate student scientists from the University of Illinois, Urbana-Champaign and is administered by the National Center for Supercomputing Applications.*

Evaluation methods: The GK-12 Evaluation team is adopting a situated evaluation approach to gathering data at each high school site, using online formative and summative evaluations of students, teachers, and fellows in addition to observation, videotaping, and interviews. Teacher and Fellow reflections are thus captured quantitatively and qualitatively. Artifact/products of students, teachers, and fellows are reviewed. Key to the evaluation process is an understanding of and sensitivity to each site's context and dynamics.

Sites: **Site 1** is located in a suburb of a large city. It was formed to offer alternative (i.e. vocational) education for students grades 10-12 to supplement their regular high school curriculum. **Site 2** has approximately 2,325 students and offers a traditional college-preparatory high school curriculum. It is located in a comparatively wealthy cosmopolitan suburb of a large city. **Site 3** has approximately 1600 students and is located in an industrial district. The school offers a diverse curriculum that includes two "academies" specializing in medical science or math/engineering/information technology for accelerated students. **Site 4** is located in a twin-city that is home to a large university. It offers a traditional college-preparatory curriculum.

Roles and relationships thus identified in the GK-12 Project partnerships that are addressed here are that of the **(1) educators and fellows as teachers/learners** and **(2) administrative decision-makers and their role in planning and support.**

Educator and Fellow Relationship: Each site differed in the roles the teachers and the fellows adopted. The model identified by the fellows in their mid-year evaluation as successful, is one in which the teacher and fellow are peers, collaboratively learning and teaching. This model allows for the educator and fellow to both be learners and teachers; and, in one problem-based learning (PBL) environment, for the students to be “teachers.” Initial data indicates that successful partnerships are less rigid, allowing for role boundaries to change and accommodate professional growth. Math and science visualization tools, course-specific technology, and computers were real-world points for collaborative learning by both the teachers and fellows.

Administration’s Role in Planning and Support: The sites differed drastically in the role that administration has played in both implementing technology in the science curriculum, and the support it offers its educators. For example, at one site, the principal was not aware of who the scientist-fellow was or what s/he was doing there, meeting only once during an eight-month period. This colored the relationship the teacher had with the fellow, and appeared to be a block to introducing new ways to integrate computer-based learning (CBL) and PBL. Another site lacked communication avenues between the teacher, the administration, and the fellow, with the administration adopting a *laissez faire* approach. This put the responsibility for implementing CBL and PBL in the classroom on the shoulders of the scientist-fellow with little guidance from the administration.

These sites contrast with one site where the administrative team has taken a pro-active role both in district-wide strategic planning and long-term support. The district is invested in learning how the GK-12 program fits into the professional development models that already exist; is growing a teacher-to-teacher mentoring program, building a culture of continued professional growth; sees data gathering as critical to informing the decision-making process; and actively seeks funding to accommodate the needs of a technology-rich science curriculum. The administration genuinely solicits teachers’ input, meeting formally and informally with teachers and fellows; and sends teachers to national conferences (i.e., NABT, NSTE, & NCTM). In practical terms, the administration demonstrates their support by arranging schedules to allow teachers “extra” time in order to plan and become comfortable with new digital tools in order to integrate PBL methods.

References:

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Acknowledgements: The authors are grateful to the National Science Foundation for support of the GK-12 EdGrid Graduate Teaching Fellowship Program (Grant/Contract # 0086455). We also wish to thank the mentors, fellows, teachers, students, coordinators and staff involved in the project. These include: Dr. Eric Jakobsson (PI), Dr. Richard Braatz (co-PI), Dr. Delwyn Harnisch, Dr. Bertram Bruce, Dr. Deanna Raineri, Lisa Bievenue, Dr. Umesh Thakkar, Dr. Jerry Uhl, Dr. Ken

Travers, Rebecca Kruse, Steven Moore, Keren Moses, John Sabo, Smitha Sririam, Dustin Lindley, Shelley Barker, Bob Fredres, Kathleen Gabric, Jim Dildine, Sean Dannenfeldt, Paul Lock, Lisa Page, Greg Hill, and Jim Polzin.