Motivating University Faculty Participation in the Training and Professional Development of P-12 Teachers

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Abstract

This article reviews and discusses certain ideas and initiatives found in the scholarship on faculty motivation, roles, and service and outreach involvement. It is intended as a resource for formulating practical applications for use in encouraging broad faculty participation in the Partnership for Reform in Science and Mathematics (PRISM), a project that calls for multi-level collaboration among P-12 teachers and higher education faculty to develop innovative approaches to science and mathematics education. Because of the importance of improving teacher education in these fields, motivating higher education faculty involvement is key for the project's success. This process is informed by competing interests, formidable barriers, and complicated approaches. The literature also suggests that a common commitment to the institutional mission, a workable understanding of different kinds of motivation, and a purpose-driven cooperation at all levels of administration and faculty can produce successful outcomes.

Introduction

Arecent *Newsweek* article referenced the 2000 Trends in International Mathematics and Science Study (TIMSS), which found significant differences in science achievement at particular grade levels in American schools. According to this study, at some levels "American elementary students weren't that far behind their peers" in schools around the globe. However, "after fifth grade, they fared horribly." The *Newsweek* piece also noted another survey of fifteen-year-olds that found American students

ranked as low as twenty-second in science skills and twenty-eighth in math compared to their peers in thirty-nine other countries. All this points to a continued pattern of decline in the nation's teaching in middle and high school science and math. The article's author concludes that this decline has occurred because "there aren't enough good teachers." It is an unfortunate reality that most "teachers may not have taken a science class since middle or high school themselves" *(Carmichael 2004)*.

The failures and problems of teacher education have been a subject of review and criticism among politicians, educators, and scholars over the last two decades. Interest in improvements has led to any number of reform proposals and initiatives. One such initiative that has recently begun in Georgia seeks to address the lagging participation of professors, especially from arts and sciences, in enhancing the teacher education experience. This article summarizes particular concerns and challenges facing that program.

The article serves a twofold purpose. (1) It reviews the important scholarship on rewards and incentives for faculty participation in service and outreach programs. (2) It offers this information as a resource for the Partnership for Reform in Science and Mathematics (PRISM), a project funded in Georgia by the National Science Foundation. PRISM is a "collaborative statewide educational reform initiative" designed "to improve educational achievement levels and close the performance gaps among Georgia's students in science and mathematics" *(UGA Board of Regents 2003)*.[1] Among its goals is a broader involvement of higher education in the professional development of P-12 science and mathematics teachers, to be achieved through a collaborative partnership of P-12 schools with universities

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and colleges. Partners include the University System of Georgia, the Georgia Department of Education, and selected public school systems across the state. This undertaking requires a retooling of the methods and structures currently in place for the training and professional development of Georgia P-12 science and mathematics teachers.

The primary aim of PRISM is a distinct improvement in the achievement and skills of Georgia P-12 students in science and

math. The project emphasizes changes in the training of P-12 teachers and proposes innovations to classroom instruction at all levels of science and math education. For example, science faculty will demonstrate more ways of "doing" science so that P-12 teachers can utilize models for their own classroom instruction and rely less on the traditional lecture method. Such models provide students with more ways to engage with and learn science and mathematics lessons. The goal requires, therefore, a willing or even eager professional collaboration across higher education disciplines in the professional training of teachers. Motivating and sustaining such collaboration among a diverse faculty is a fundamental challenge for the PRISM project. Consequently, this article reviews some important scholarship regarding faculty motivation and rewards.

Professional Development and Reform

In recent years, a significant shift has occurred in the relationship between higher education institutions and P-12 schools. Prior to this shift, typical relationships were "characterized by a set of more or less informal agreements that provided contexts" for teacher development programs *(Fetters and Vellom 2001, 67)*. Such informalities usually consisted of one of two arrangements. In one type, a school might contract for the services of a college or university to address a particular need for a specified length of time. This was often a closely defined, temporary agreement. The other type involved a more fluid arrangement whereby a school sought ongoing "advice and support" or resources from a nearby college or university faculty for a variety of purposes. In both instances, benefits to the local school far outweighed any to the participating higher education partner. Among the few incentives for higher education faculty in such arrangements was a qualified view of local schools as "likely sites for investigating problems and successes in teaching and learning" *(Fetters and Vellom 2001, 67)*. These limited collaborations rarely involved academic departments outside the college of education.

Recently, some scholars have recognized and commented on these inequitable relationships between local schools and higher education institutions. Reformers have suggested redesigning these relationships from "the earlier 'individual needs' based model to more robust forms that engender mutual benefits" *(Fetters and Vellom 2001, 67)*. One innovation that has emerged is the Professional Development Schools (PDS) introduced by the Holmes Group. The Holmes Group began in 1986 as a consortium of ninety-six

research universities and professional education programs "committed to raising the standards of the academic performance of American students through a more rigorous preparation of teachers" *(Tyson 1997)*. In May 1986, it published a report titled "Tomorrow's Teachers," which outlined its "vision of good teaching, analyzed the obstacles to attaining it, and recommended an agenda of actions to address five goals," including issues identified as critical to any meaningful reform *(Holmes Group. Origins)*.

The Holmes Group has been at the forefront of those who have sought to understand and reform the professional development of teachers. In 1997, it published "The Rise and Fall of Teacher Education Reform." This report outlined many of the obstacles confronting higher education–P-12 collaborations and concluded, "the reform of professional education is so complicated and difficult that it has not yielded to any one reform [group's] efforts to improve it" *(Holmes Group. Origins)*. Other scholarship has confirmed their conclusions. Not surprisingly, the PDS model has met with limited success and suffered criticisms of its own. Renee Campoy notes that the PDS model is "one of the most compelling and complex models of educational reform" but agrees with the Holmes Group findings that reforms often fail due to various "conflicts" and "barriers" within and between the university and school partnerships *(Campoy 2002, 6, 8)*.

The Holmes Group and Campoy also agree that "educational change should take place simultaneously at the K-12 school and at the university in order for true educational reform to occur," but because the "cultural clashes" frequently present conflicts of interest on issues like "rewards, educational missions, pedagogical views, and organizational evaluation of the changes," any real reform is lost *(Campoy 2002, 6)*. Additionally, tensions between higher education administrators and faculty over promotion and reward structures further hinder outreach collaborations *(Campoy 2002, 5–6)*. The key to reform, then, is breaking this gridlock by understanding the many dimensions of faculty motivation. In fact, the long-term success of PRISM depends largely upon the issue of faculty motivation.

Research Culture and Tenure

Faculty motivation theories have been the subject of a great deal of scholarship in the last decade. Many scholars have focused on faculty involvement in outreach and engagement activities and its congruence with institutional missions and incongruence with

reward structures. Some blame the durable subcultures among higher education faculty for perpetuating the polarization of institutional missions that promote service and outreach versus institutional rewards that clearly favor research and publishing. Because publication has become a distinctive criterion for tenure and promotion in higher education, the tension between mission and rewards is not merely a research-one institution problem.

Tenure and promotion policies have developed consistently across higher education institutions, leading to an increase in the time faculty spend on activities contributing toward publication and research. The faculty of "less prestigious institutions emulate the work characteristics of their peers at research universities and less prestigious institutions model their research standards after the most prestigious universities in order to increase their national standing." This emulation, which emerged prominently in the 1960s, reflects a phenomenon called "institutional isomorphism." It continued mostly unabated until the 1980s, when "pressures from within and outside higher education criticized colleges and universities for neglecting the teaching and service aspects of their missions." This "research culture" had deterred many faculty members from activities beyond their researching and publishing goals and had begun to jeopardize university-community relations *(O'Meara 2002, 13–14)*.

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Among the casualties of this research culture have been the teacher education and development programs. Attempts to broaden cross-disciplinary involvement into teacher education programs abruptly collide with the publish-or-perish academic culture pervading American higher education. To avoid such collisions, some scholars have advocated a more effective realignment of the institutional mission of outreach and service with reward structures. Campoy *(2002, 11)* refers to the disconnect between mission and rewards as institutional "schizophrenia." For Campoy and others, this imbalance is destructive to institutional relations with the community at large and is a disservice to faculty interested in outreach and service. Reward structures, then, need serious reconsideration to foster faculty interest beyond research and publishing, given "evidence that strongly supports the hypothesis that professors do

what they are paid to do" *(Ditts, Haber, and Bialik 1994, 43)*. Any effective reconsideration of rewards for faculty must take into account how extrinsic motivations more generally affect faculty behaviors.

The greatest of all motivators for faculty are promotion and tenure incentives. Because there are limitations even to these incentives for service-oriented work, researchers have offered alternative reward structures for encouraging faculty interests beyond research and publishing. Nevertheless, the aim is a difficult one as institutions remain inclined to reward scholarship only in terms of academic publication. As one scholar testifies, "amending academic reward systems to include a broader definition of scholarship is a 'messy business' that throws together issues of institutional mission, leadership, external forces, faculty socialization, and the nature of faculty professional service and scholarship into one complex puzzle" *(O'Meara 2002, 2)*. Many suggest that new approaches to rewards are necessary for greater faculty participation in service programs such as teacher development programs. "Such activities would not be 'service' in the pejorative use of the word sometimes accorded citizenship activity like campus committees or community volunteering. Instead, they are acts of scholarship, motivated as much by faculty and institutional self-interest as by philanthropy" *(Gips and Stoel 1999, 3)*.[2] Without a serious reconsideration of faculty roles and rewards, the traditional practices will remain a significant obstacle to the progressive relationship between colleges and their communities.

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Overcoming the research culture tradition means confronting head-on an entrenched "research-driven faculty" atop a "hierarchy of prestige" that has developed among universities *(Campoy 2002, 11, 2)*. Within this highly competitive hierarchy, the greatest rewards go to those with the most significant research and publications while all other academic endeavors suffer for lack of sustained attention. Not even the well-intentioned efforts by administrators to create positions specifically for service projects spark much appeal away from a zealous research culture. In fact, those within the hierarchy tend to "ghettoize" those faculty participating in service projects,

who are more often "viewed as second-class citizens with low pay, heavy teaching loads, and lesser prestige." This stratification leads to a "revolving door of university faculty" who are willing to participate in work outside their research and thus hampers any sustained involvement in service or outreach activities *(Campoy 2002, 11)*. New approaches to faculty rewards are needed to break the iron grip of this research culture.

Other Dimensions of Faculty Motivation

Some scholars believe that intrinsic motivations work more effectively on faculty interests and behaviors than external rewards. As one states, "faculty motivation for involvement in outreach and service-learning has been found to be largely intrinsic, with studies showing that many faculty pursue these service activities regardless of external rewards" *(O'Meara 2003, 204)*. Another study notes "the reward structure's relative unimportance" to service activities and further downplays any overall influence of extrinsic motivators *(Abes, Jackson, and Jones 2002)*. "In an academic environment . . . intrinsic satisfactions are more effective than extrinsic factors in influencing motivation and performance," one study pointedly remarks *(Wolcott and Betts 1999)*. The problem is, however, that intrinsic motivations are much more complex and more difficult to calculate than external incentives.

KerryAnn O'Meara attempts to incorporate intrinsic factors into reward structures by relating them "to the nature of faculty work itself." For faculty, an intrinsic reward stems from

> how the work is done and how it affects the faculty member, the variety of activities involved in the work, the degree to which someone performs the activity from beginning to end, the autonomy the person has in doing the work, the responsibility involved, and the amount of feedback the person receives concerning the performance.

These "intrinsic dimensions of faculty work" are those which "contribute most to satisfaction." The most important of these dimensions are "autonomy and freedom, intellectual exchange, and the opportunity to work with and impact students." All three aspects have critical effects on service and outreach participation, according to O'Meara *(2003, 204)*.

Certain work on the subject approaches the relationship between faculty behavior and intrinsic rewards on a more theoretical level. One study in particular applies principles proposed

by the psychologist and professor Mihaly Csikszentmihaly *(Froh, Menges, and Walker 1993)*.[3] In drawing on Csikszentmihaly's concept of "flow experiences," the article cites conditions and circumstances more apt to yield personal satisfaction in professional activities.[4] These occur when faculty

1. set goals where challenges are not too far ahead of their developing skills, and where feedback can be monitored to easily modify goals;

2. become immersed in the activity by finding a close mesh between the demands of the environment and their capacity to act;

3. pay attention to what is happening by maintaining concentration and deep involvement and by getting rid of self-consciousness;

4. learn to enjoy immediate experience even when objective circumstances are difficult *(Froh, Menges, and Walker 1993, 87–88)*.

The challenge is to provide for faculty those activities, environs, and resources that will offer them the best opportunities for achieving these conditions. Otherwise faculty will likely become anxious, bored, or apathetic and unable to find sincere fulfillment in their activities *(Froh, Menges, and Walker 1993, 88)*.

Other scholars doubt the viability of such simple prescriptions for motivating faculty behaviors. Motivation, they claim, whether extrinsic or intrinsic, is not simply linear concepts or practices. In fact, "those who seek to support and enhance the performance of others would find greatest success through a combination of awareness of the individual differences and backgrounds of those with whom they work, and the creative organization of situations and stimuli that have the greatest potential to elicit both the productive motivational responses and the subsequent effort that increase the likelihood of success." In other words, motivations are not one-dimensional but multidimensional. Motivation is not limited to interest or effort; rather, it results from a variety of internal and external influences. "There is a synergistic cycle of factors that promotes shared ownership and responsibility, expectancy for success, persistence, achievement, and satisfaction" *(Theall and Franklin 1999, 99)*.

Indicative of the complex ways motivating factors work in higher education are the ways in which the federal government

and corporate America have influenced the direction and culture of faculty work. Increasingly, "the focus on research and publication and the mad dash for federal funds and external grants has diverted energies away from important faculty work and has had a direct and negative impact on the quality of classroom instruction and the ability of institutions to provide support for and involvement in their communities" *(Diamond 1999, 5)*. Faculty have found bountiful support from governmental monies and market competition for the research and development resources in university systems. Numerous financial benefactors, whether individuals, corporations, or nonprofit groups, have softened the ebb and flow of state budget allocations and have added to the siphoning from traditional faculty roles and service. The term for this "pattern of diverting time, thought and energy away from teaching and basic research" is called "commitment conflict" *(Kezar 2004, 441)*, and its presence complicates the already fierce competition for encouraging service and outreach activities such as teacher development programs.

The recent literature on faculty service, motivation, and university-community partnerships offers numerous models and prescriptions for encouraging faculty involvement in activities beyond research and publishing. Many reseachers have focused on extrinsic rewards, especially promotion and financial incentives. Reform literature often advocates broad changes to promotion and tenure policies. Other works propose alternative motivational formulas for faculty that attempt to avoid the pitfalls associated with tampering with promotion and tenure policies.

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These alternative measures of motivation can vary. Some examples include extra vacation days and fringe benefits, specialized bonuses, titles, and "institutional recognition." Course development grants could provide "funds to support the purchase of necessary equipment, develop instructional materials, and pay for other incidentals." Reducing teaching loads or offering one and a half or double credit for particular service work could be effective, as could release time or mini-sabbaticals. In addition, institutions

might attract faculty to service projects by "establishing travel accounts, purchasing new computer equipment, funding graduate assistants or graders, or providing valued campus commodities such as 'a roving parking sticker'" *(Wolcott and Betts 1999)*.

Several studies have noted the power of formal as well as casual recognition for faculty contributions beyond normal roles. Research has shown significant results when department heads and administrators recognize work accomplished through "'atta boys' and notes of appreciation, and publicly in the form of certificates presented at college faculty or staff meetings" *(Wolcott and Betts 1999)*. Even beyond the campus, faculty can enjoy recognition from presentations at conferences, scholarly publications, or external grant awards. The potential offered by such recognition can be profound, according to many concerned with faculty behavior and motivation. Campus Compact, for instance, is dedicated to improving civic engagement by higher education; its Web site calls on institutions to "[e]stablish an annual award for faculty achievement" and to spotlight "engaged faculty and their projects in campus publications" *(Campus Compact 2001b)*.

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Another motivating influence on faculty is peer involvement. Research indicates that "colleagues, especially department chairpersons and faculty within departments, are an important impetus" to outreach projects and service work *(Abes, Jackson, and Jones 2002)*. A "supportive teaching culture," in which colleagues interact in productive and meaningful ways, broadens the perceptions of faculty work and responsibilities beyond the classroom.[5] Motivations for such work increase when there is a professional culture that continually provides "the opportunity for collegial interaction and collaboration" *(Feldman and Paulsen 1999, 75, 73)*.

O'Meara reveals that a faculty member's career stage is often a strong factor in service work. A new professor usually will demonstrate very different attitudes toward extra workloads and projects than someone at midcareer. Therefore, "interest in various faculty roles seems to vary among professors with different levels of experience" *(O'Meara 2003, 206)*. Renee Campoy complements O'Meara's thinking by suggesting that junior faculty members, for various reasons, tend to demonstrate more interest in service and outreach projects. Newer faculty are more apt to want to impress

or please university administrators by participating in favored projects or programs. Junior faculty, in addition, are more apt to foresee tangible benefits to their area of scholarship from participating in projects closely associated with the field. They might see them as broader opportunities for applying their research and a means of enhancing their professional exposure. Such opportunities can offer them an unconventional laboratory for new ideas or an alternative means of viewing their research *(Campoy 2002, 9–10)*.

O'Meara also finds that interest in service increases with faculty experience. Hence "mid-career and late-career faculty display a decreased interest in research but an increased enthusiasm for teaching and increased interest in institutional service." Faculty will often "get more involved in service activities as they become more comfortable with their teaching responsibilities and less pressured by demands for scholarship." She adds that "at different stages a faculty member may be motivated by different factors" *(O'Meara 2003, 206)*. Later career stages tend to be associated with seeking out intrinsic or personal fulfillment rather than material rewards. Extrinsic rewards, therefore, are more effective in earlier career stages.

Arts and Sciences in Teacher Development

There have been a number of studies and initiatives aimed specifically at encouraging more arts and sciences faculty involvement in teacher development. The National Research Council (NRC) formed the Committee on Science and Mathematics Teacher Preparation (CSMTP) in 1998 to evaluate K-12 teacher development in science and mathematics. The committee's report, published in 2001, proposed a number of guiding principles for improving teacher preparedness *(NRC CSMTP 2001, xiii)*. These principles, along with the committee's subsequent recommendations, require equal shouldering of responsibilities among higher education departments. The report highlights the importance of complementing pedagogy with content knowledge. In its final principle, the report requests from colleges and universities "more scientists, mathematicians, and engineers to provide teachers with the *appropriate* content knowledge and pedagogy of their disciplines." This interdisciplinary approach to teacher development would "require more commitment of time, effort, and intellectual engagement than other, more traditional faculty responsibilities" and thus a reconsideration of policies concerning incentives and rewards *(NRC CSMTP 2001, xiv)*.

As others have noted, there are many difficulties in achieving a cross-disciplinary approach to teacher education. Competitive attitudes and fierce political divisions often remain entrenched along departmental lines. "The chasm separating the arts and science faculty from the education faculty is deep and wide" *(Butler 1997, 19)*. One study blames the traditional university organizational structure for the frequent failures of interdisciplinary collaborations. Departments are split from one another by "stovepiping" configurations whereby each is "maximally motivated to improve its own act without great concern for the folks next door" *(Gips and Stoel 1999, 2)*. Part of the answer, the same study suggests, is to enhance the "horizonality" of institutions so that there is an impetus for cooperation and common goal-setting among various academic units. The rigidity of a reward system also contributes to the problem and "provides little encouragement for faculty to collaborate, either within or across disciplines" *(Ohio Legislative Office of Education Oversight 1993, 15)*. The Oregon University System in particular has weighed in on these obstacles.

In spring 2002, representatives from the Departments of Education and Arts and Sciences across the Oregon University System held the second of two summits convened to address "the role of Arts and Sciences in preparing a quality PreK-12 educator workforce in Oregon." One of the stated goals of the conference was to "[i]dentify the most promising strategies being used to link Education and Arts and Sciences including. . . 'models' and best practices . . . in Oregon" *(Oregon University System 2002)*. During the course of their discussions, representatives also identified a number of barriers to strengthening interdisciplinary collaboration in teacher development practices. A sampling of these follows.

- Getting the arts/sciences deans and/or provosts to value working with teacher preparation when making promotion and tenure decisions;

- Getting faculty from arts/sciences to meet with education faculty;

- Getting arts/sciences faculty to add content to courses (particularly core courses) to make them more relevant for future teachers;

- Getting faculty in arts/sciences to be aware that there are future teachers in their classrooms, and then to implement strategies to refer and advise them to assist in early recruitment, and to also address content-related issues;

- Addressing faculty turf issues related to implementing new courses relevant for prospective teachers *(Oregon University System 2002).*

The summit provided strategies for developing more effective collaborations among the academic disciplines. Spokespeople and representatives borrowed ideas and reform initiatives from other states working on the same problems. California, for instance, utilized a project called Blended Programs as a "key strategy for enhancing Arts/Science involvement" and "to increase faculty collaboration" in undergraduate teacher development. This is a funded program requiring a multidisciplinary blending of content and pedagogy while cooperating on mapping out an effective standard curriculum for teaching degrees. California also reported broader strategies useful in promoting interdisciplinary cooperation:

- provide financial incentives for collaborative work among the faculty (release time, stipends, materials, course buyouts, extra time assignments);

- provide programmatic incentives for collaborative work (shared program planning, shared teaching, shared program decision making and administration);

- provide moral incentives for collaborative work (institutional philosophy, goals, merit and other awards);

- provide external mandates for collaborative work (establishing accreditation standards around collaboration) *(Oregon University System 2002)*.

Another model for addressing the "chasm" between arts and science departments and education departments is the University of Washington's *Physics by Inquiry*. This is a three-volume "set of laboratory-based modules that provide a step-by-step introduction to physics and the physical sciences" *(University of Washington n.d.)*. It is a successful example of interdisciplinary collaboration supported by Washington's Statewide Systemic Initiative (SSI). The collaboration between the Physics Department and Education Department at the University of Washington is known as the Physics Education Group and produced the *Physics by Inquiry* resources. *Physics by Inquiry* includes a set of specifically designed courses for elementary, middle school, and high school science teachers and has been effectively utilized in numerous states. The program is based on the perception that the "separation of instruction in science (which takes place in science courses) from instruction in

methodology (which takes place in education courses) decreases the value of both for teachers" *(McDermott, Shaffer, and Constantinou 2000, 416)*. Its sound practice and undisputed success help to sustain interdisciplinary faculty motivation and participation.

There are other examples of institutions promoting and achieving greater cooperation between arts and sciences and education departments. The University of Wisconsin at Madison has achieved some measure of success under the banner of "the Wisconsin Idea" *(see Stark [1995]; Campus Compact 2001a; University of Wisconsin–Madison [1994])*. Although a somewhat ambiguous and variously interpreted motto, it has been an effective rallying call for university service and outreach in the state. In fact, the motto itself has become synonymous with mission, particularly at the University of Wisconsin.

Michigan State University pursues an aggressive policy for outreach that encourages cross-disciplinary activities among faculty. This university uses broader definitions of service and outreach to establish greater opportunities for faculty to showcase their scholarship or demonstrate it to the surrounding communities. Such an institutional approach "should stimulate outreach that cross-cuts teaching, research, and service, and also encourage vibrant cross-campus connections for outreach" *(Michigan State University 1993)*. The efforts at Michigan State have led to successful programs like its All-University Research-Outreach Grant Program, its Service-Learning Fellows Program, and the Michigan State University Outreach Faculty Fellows Program.

A final suggestion for improving interdisciplinary cooperation in service and outreach comes from a report of the Consortium for Policy Research in Education *(CPRE 2000)*. This policy brief resulted from a conference at Stanford University on the role of state legislatures in systemic reforms for education. The report gave several suggestions for improved teaching based on experiences and findings at various universities and colleges. High on its list was the need for institutions to "[d]evelop new linkages between education school faculty and arts and science faculty." It suggests that all departments must jointly "take responsibility for teacher preparation if students are to arrive at their institutions fully prepared" and then cites several institutions already taking the lead on this priority. For example, faculties in both departments at the University of Texas at El Paso and Eastern Connecticut University "regularly collaborate on what and how future teachers should learn" *(CPRE 2000, 8)*.

This article has attempted to outline some of the important scholarship and initiatives aimed at improving higher education and outreach, particularly in light of teacher development programs proposed by PRISM. The ideas covered here are but a sampling of the massive work ongoing on faculty roles and behaviors. If this has offered some insight and increased interest in the subject, then it has met its goal.

Endnotes

1. For more information on the PRISM initiative in Georgia, see its official Web site at http://www.gaprism.org/index.phtml.

2. This is a report on a three-year study at four universities (California State University, Northridge; Temple University; University of Southern Colorado; and University of Texas at El Paso) and the effort to reform faculty reward structures to include collaborative work with K-12 projects. Much of its emphasis is on promotion and tenure reform, which is not the primary focus of this article. Nonetheless, the work reflects the growing importance of a structured, continuous educational partnership between a variety of disciplines in higher education institutions and K-12 schools.

3. In this article, the authors draw specifically from Mihaly Csikszentmihaly, *Flow: The Psychology of Optimal Experience (New York: HarperCollins, 1990)*.

4. Terms that the authors find critical to their analysis are defined here: "flow experiences" = "when skills and challenges are nearly in balance" or when "challenges can be adjusted so they are just ahead of skills"; "anxiety" = "skills are insufficient to the challenge of a task"; "boredom" = "skills are more than is needed"; "apathy" = "when a person is capable of both higher skills and higher challenges than a task offers" *(Froh, Menges, and Walker 1993, 88)*.

5. For an interesting discussion of the numbers of peers necessary to effect changes, see *Farmer 1999*, especially page 92. Farmer states that a "critical mass" is often necessary for meaningful, sustained changes in academic culture or institutional improvements. A critical mass is not a simple majority; rather, it is "composed of faculty opinion makers who have the ability to attract the support or who enjoy the tolerance of other faculty." These "opinion makers" are valued and respected enough by their colleagues so that in given circumstances of foreseeable agreement they can affect faculty-at-large inclination toward or away from change.

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