2. A Primer on Mentoring

by Michael A. De Miranda and Ethan B. Lipton

This article is designed for educators and industry leaders who are involved or interested in the development of faculty in higher education to meet the needs of students, institutions, and industry. Informal and formal mentoring strategies that aid in identification and support of qualified and qualifiable faculty are discussed. Also, strategies to facilitate an atmosphere for mentoring are presented along with an example of a successful mentoring program. We also discuss the term *diversity* as one of the desirable goals that mentoring may help to achieve, while emphasizing it in a context of the realities of our changing society of which those of us who prepare professionals must be aware.

RATIONALE

Obviously, we all want highly qualified faculty in technology. They are essential in the effective preparation of students to enter and advance in the technology professions.

The term diversity is often defined using the word variety. It may encompass a wide range of types of diversity including, but not limited to, ethnicity, age, or gender. Gerth and Weiner (1994) presented an interesting view to consider:

> Diversity is about how "us" and "them" are defined, how "we" separate ourselves from others and how such distinctions impact on human life. The differences are manifold—indeed, they include all the possible groupings of individuals by characteristics they share or do not share. At its core the discussion of diversity in higher education calls upon us to revisit questions about the skills and sensitivities needed for constructive relations among people who are different, the principles that animate a just and democratic society, and the variety of knowledge that is important for scholars both to seek and to teach. The gift that diversity gives is the insistent invitation to ask hard questions about what we mean by education, how we teach, which people should be included as students and teachers, and what we are accomplishing in our colleges and universities. If we let it, diversity can renew our campuses. (p. xi)

Professionals involved in industrial and technology education must be concerned about quality and diversity as they relate to (a) the nature and needs of our students, (b) the nature of the workforce into which our students will be entering and developing, and (c) the makeup of our profession and department faculties.

SUCCESSFUL MENTORING STRATEGIES

A mentor serves as a trusted counselor, advisor, role model, and teacher. He or she is paired with a mentee for purposes of professional and personal development.

Mentoring strategies play important roles in the development of a highly qualified and diverse industrial and technology education faculty. They may assist in the identification of qualified and qualifiable faculty; they may assist with access into, and promotion within, all areas of industrial and technology education professions; and they assist in the development of much-needed role models. Mentoring programs and the institutionalizing of an atmosphere conducive to mentoring and mutual support impact both majority and underrepresented populations among students, potential students, faculty, potential faculty, the community, and society. They benefit individuals, the institution, and the profession.

Informal Strategies

A valuable strategy for identifying a potential faculty member is broad awareness. Broad awareness is a simple yet complex informal strategy that requires prospective mentors to be alert to, and monitor, professional activities of others. Broad awareness can best be explained by the following example:

> *While at a local conference planning committee session, a department chair observes that a new faculty member is actively participating in the discourse around the table. This person lacks experience in conference planning and many of her comments may not be well focused. But the chair detects a sincere desire on her part to contribute. In subsequent professional meetings and symposia throughout the state, this chair notices this young faculty person's participation.*

This example has classic characteristics of a potential young leader who could develop into a valuable faculty member. The identification and informal monitoring of young professionals who exhibit early signs of leadership and professionalism, however undeveloped, are key first steps towards the identification of potentially qualifiable and diverse faculty.

Broad awareness requires mentors to not read into the actions of undeveloped talent, but rather look to see the positive potential of these behaviors. A second step of this process occurs following identification. This step requires the entry of an informal mentor role model called *the quiet advocate*. The quiet advocate begins the nurturing process of a potential mentee, being guided by four actions: expose, include, inform, and correct. The quiet advocate exposes strengths and contributions by including the mentee in success or win-win activities. These activities should represent opportunities for the mentee to gradually gain confidence, recognition, and responsibility. During this period the quiet advocate monitors, assists, and provides constructive guidance to the mentee. An important strategy for the developmental success of the mentee is for the quiet advocate to guard against the mentee entering into perilous situations and overload conditions.

This period of quiet advocacy and informal development could extend from one to five years or more. In order to keep the goal directed on the potential development of a faculty member, the quiet advocate must keep the mentee focused on completing a terminal degree (if one has not been achieved) suitable for the faculty appointment and/or meeting the necessary requirements for tenure and promotion. The quiet advocate is really an informal champion of the mentee. As time passes, the role of quiet advocate should evolve into a recognized mentor. To strengthen this informal mentor-mentee relationship, mentors may invite mentees to

collaborate on research projects, co-author scholarly works and professional presentations, and co-chair and assist in professional activities. They may also provide important advice on selection of teaching assignments, professional activities, and other related activities.

Formal Strategies

Wunsch (1994a, 1994b) advocated formal mentoring programs, with planned structure aimed to assure that mentoring occurs in a systematic and productive way. Many universities and colleges have established some structured, institutionalized programs that may be valuable. They may be accessed to fully meet the needs or utilized as components of a new program.

Academic departments in technology can also create or capitalize on existing formal mentoring programs. Most formal programs are designed to develop qualifiable faculty candidates or assist junior faculty in meeting the requirements for retention, tenure, and promotion.

Formal institutionalized programs designed to assist in the development of qualifiable faculty candidates generally are categorized into mentoring, scholarship, fellowship/assistantship, and incentive loan programs. These programs usually require that a faculty mentor or advisor be assigned to each participant for purposes of program and professional guidance. The mentors in these formal programs are required to document the deliverables and guidance they will render to the mentee. These deliverables include regular advisement meetings, research assistance, and professional development activities in which they will jointly participate.

From the perspective of the department, these formal mentoring strategies facilitate direct involvement of senior faculty in the educational and professional development of potential and/or junior faculty. The valuable insight that departments gain into the potential and characteristics of a prospective faculty member are unparalleled. The "closeness of fit" between a potential qualified faculty member and the culture of a department can be accurately assessed.

A unique program closely associated with these types of mentoring programs is the California State Forgivable Loan/Doctoral Incentive Program. This program is designed to seek and develop qualifiable candidates to compete for positions within the California State University (CSU) system. In this formal program, students are matched and "sponsored" by university faculty and departments. The faculty/department members agree to mentor the student through graduate school to the completion of a terminal degree. During this time the student receives financial and professional support (up to $10,000 per year for up to three years) in the form of a forgivable loan. Should the student compete successfully for a faculty position within the CSU system, the loan is forgiven at a rate of 20% per year of service (Lipton, De Miranda, & Cain, 1995).

While many formal mentoring strategies are designed to aid and develop a prospective diverse faculty pool, formal mentoring strategies must also focus on the retention, promotion, and tenure of new and junior faculty. Within a department, school, or university, a formal mentoring strategy can greatly increase the productivity and retention rate of new faculty. One such program established at California State University, Los Angeles is the Faculty Mentor Project (FMP). This project is designed to increase the efficiency and productivity of new faculty by pairing them with a well-respected senior faculty member within their department. The aim of the FMP is to facilitate the professional and social enculturation of new faculty members into the university community. The mentor-mentee relationship of the FMP is quite different than other formal and informal mentoring projects discussed earlier. In the FMP, the mentor-mentee relationship is a peer relationship in which the mentor and mentee are from the same department. From the perspective of the new faculty member, this type of relationship is quite valuable in getting "up to speed" in a timely and efficient manner. From a mentor perspective, this relationship represents an opportunity to bring a new faculty member to a level of departmental contribution much earlier than the usual one to two year adjustment period. The mentor also acclimates the mentee to department, school, and university structure that will enable the new faculty member to more appropriately participate in university activities required for tenure and promotion. This formal mentoring program represents a form of professional partnership in which the mentor guides, coaches, and then fades as the mentee grows confident and ever more accustomed to the academic environment.

Reverse Mentoring

As a mentor-mentee relationship matures, many benefits and opportunities emerge for both participants. One result of a successful mentoring relationship, be it formal or informal, is the opportunity for *reverse mentoring*. Developed out of trust and mutual respect between the mentor and mentee, reverse mentoring is a value-added interactive process that complements a professional atmosphere within an academic department. It emerges when the energy, enthusiasm, and current cutting-edge content knowledge of a junior faculty member are mixed with the wisdom, knowledge, expertise, and experience of a more senior member. This combination may result in new ideas, vision, and perspectives that benefit the more senior faculty member, the more junior faculty member, and the entire department. The mentee, now more mature and confident, begins to include, inform, collaborate, and correct his or her mentor, when appropriate. Both mutually lead and assume the roles of the quiet advocate for each other. This most exciting outcome of a mature mentoring relationship is an excellent indication of a successful mentoring process and a valuable indicator that the highest goals of mentoring are being achieved.

DEVELOPMENT, IMPLEMENTATION, AND ASSESSMENT

Successful mentoring programs are the result of planning and preparation. They should be developed and implemented only after a review of appropriate research and careful consideration of the needs and variables of the institution, department, and constituencies. Wunsch (1994a) provided an expanded version of the following checklist, well designed to stimulate questions needed to implement a comprehensive mentoring program:

- Assessing individual and institutional needs for mentoring.

- Defining goals and outcomes for mentoring.
- Positing the program in the organization.
- Determining and obtaining program resources.
- Developing and coordinating the program.
- Selecting and monitoring participants.
- Assessing the program.

These provide an overview of issues that must be considered. Their successful implementation will require commitment by the participants, the department, and the institution.

The development of faculty in technology programs who can work, manage, and lead in a diverse environment ought to be a mission of our institutions and programs. The preparation of graduates who are well prepared to meet the challenges of careers in technology professions requires a highly qualified faculty. Members of a diverse faculty who are prepared to provide the appropriate learning experiences may also provide critical elements as role models for all students and faculty.

Informal and formal mentoring designed to facilitate the development of highly qualified and diverse faculty enrich and strengthen academic institutions. As academic programs in technology evolve and grow, the need for highly qualified diverse faculty will increase. Mechanisms and strategies to meet the challenge of the 21st century must be implemented and institutionalized to meet the requirements of industry and education for a diverse professional workforce. These challenges can only be met if the academic role models are in place to inspire, motivate, educate, and meet the needs of America's greatest strength—diversity.

Richardson and Skinner (1991) asserted that "the principal obstacle to changing the learning environment to better accommodate diversity and quality is the degree to which current arrangements serve the purposes of those who operate the higher education enterprise" (pp. 253-254). The future of our professions, and that of our students, may be enhanced through continued examination of issues related to quality and diversity. Open minds must apply this knowledge and available resources to develop, implement, and institutionalize successful mentoring programs to meet the needs of students, institutions, industry, and society.

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3. Government Policies Impact Technology Education in India

by R. Natarajan

Since the country's independence in 1947, a series of well-conceived policy statements has been enunciated. They include the Scientific Policy Resolution (1958), The Technology Policy Statement (1983), The National Policy on Education (1986), and a series of Industrial Policy Resolution Statements beginning in 1948, the latest one being drafted in 1991. A draft for a new technology policy was circulated for discussion in 1995. It is generally accepted that science, technology, and education are critical ingredients for national economic and social development. While science and technology influence the utilization of natural resources and capital, education is concerned with human resource development. July 1991 marked the beginning of a sea change in our perception of national economic development. The New Economic Policy and the New Industrial Policy (of 1991) were aimed at promoting globalization, privatization, and liberalization.

In post-independence India, the goals of education have been tuned to be in line with national goals and aspirations. These include economic development to further the material well-being of people, social and political development for living harmoniously and promoting a democratic and just society, and intellectual, cultural, and aesthetic development to enrich the quality of life. There is no doubt that there has been a discernible and credible quantitative expansion in science