Increasing Retention of Students at Risk through Mentoring and Learning Communities

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Abstract

Mentoring and learning communities are among the most successful strategies for increasing retention of students at risk. This paper reports experiences and techniques from the design and implementation of mentoring and learning community programs at a commuter university. The techniques have proven to be successful, cost effective strategies to increase retention among entering freshmen students. The program implements widely used techniques, together with techniques tuned to the unique needs of at risk students. The program’s techniques are applicable across a broad range of university populations. Its social elements address a critical need in the sometimes difficult transition to university life often not explicitly addressed by university wide programs, but dealt with well at the small group and department level. For at risk students entering STEM disciplines, these challenges are particularly acute and often include lack of skills. The program’s academically focused elements supplement, coordinate, and refine existing university structures and programs with an emphasis on the needs of entering freshman students. Activities 1) introduce participants to the university’s culture and processes, 2) provide ongoing tutorial support, 3) create opportunities for one-to-one interactions with faculty and successful upper class students, 4) supply less formal structures for social interaction, and 5) introduce students to university resources, such as financial aid and career placement. The program has been able to attract highly qualified and dedicated student mentors. A key element is the personalized experience in which peer and mentor support is available. A significant component of the mentoring experience was introduction of participants to existing services and the department communities.

Introduction

The transition from high school to university is often challenging for students. Not only must the student adapt to significant academic and social change, but he or she must do so at a time in which identity differentiation is a central developmental issue¹. Strategies to increase the chance of success in making the transition to university life can systematically address the elements of identity development, including developing competence, moving through autonomy and toward interdependence,
developing mature interpersonal relationships, developing purpose, and developing integrity. Some elements, especially those concerned with autonomy and purpose, are naturally highlighted in the change of academic expectations in university coursework. Others, such as social and interpersonal elements, are less explicitly addressed in academic settings. For the entering student, having a trusted and experienced guide, a mentor, can play a significant role in moving through this stage of identity development, as well as in navigating the other, equally important elements of the transition to university life.

In delineating the factors that account for student success less than one-fourth of students list intelligence as critical in university success. The single most important factor is reported to be persistence. Other important elements are student role models, faculty and student interaction outside the classroom, settings for scholastic interaction and discussion, perception of improvement in abilities and skills, and involvement in the college learning experience. While these all apply at some level to all students, they are particularly relevant to entering students, students who have little social attachment to the university, such as commuter students, or students who have not had experience with university life through family or other social mechanisms. Students learn by becoming involved, and success in learning leads to improved retention of students. This is critical for commuter students, as well as at risk student, who have been found to be passive in academic settings. A mentoring and learning community approach provides opportunities to deal with each of these persistence factors.

**Program Description**

The Mentoring and Learning Communities (MLC) program that is currently being delivered to freshman students in computer science and engineering at the University of Texas – Pan American implements a number of widely used techniques for addressing the challenges of building a student community and providing student support, together with techniques tuned to the unique needs of students at this university. The program’s academically focused elements supplement, coordinate, and refine existing university structures and programs with an emphasis on needs of entering students. Its social elements provide a critical element in the transition to university life that is not supplied by existing university programs. The program’s techniques are applicable across a broad range of university populations.

The MLC program provides a series of activities that 1) introduce participants to the university’s culture and processes, 2) provide ongoing tutorial support, 3) create opportunities for one-to-one interactions with faculty and successful upper class students, 4) supply less formal structures for social interaction, and 5) introduce students to university resources, such as financial aid and career placement. The program has been able to attract highly qualified and dedicated student mentors. A key element is the personalized experience in which peer and mentor support is available. A significant component of the mentoring experience has been introduction of participants to existing services and the computer science and engineering departmental communities. A college wide Student Speaker Series was designed and implemented by the program’s mentors, providing an opportunity for program participants to become integrated with the broader social and departmental cultures.

**Participants, Mentors, and Faculty Advisors**

Participants from the entering freshman class are recruited during pre-semester advising of incoming
students and during the first weeks of the semester, primarily through classroom visitations by the program’s mentors and announcements from faculty. Participants can join the program at any time, and the number of participants tends to increase through the year. The Student Speaker Series described below has proven to be a particularly effective way to introduce students to the program and its services. Groups meet weekly with mentors in a learning community setting. Individual groups of five to ten students work with a single mentor. Content of the weekly sessions varies throughout the year. For example, initial meetings focus on advisement and the transition to university life. Meetings with all participants foster cohort interaction and create a “freshman year experience”. Social meetings sponsored by the program in the university’s union and off-campus at theaters also contribute. Groups are formed such that members typically share common courses. Participants make a commitment of three hours per week to the program. During meetings, mentors and students work collaboratively on course work and goal achievement.

Mentors are juniors and seniors and receive training in interacting in the small group setting. Mentors thus have expertise in working with students, as well as success in completing degree programs. In the learning community setting program mentors serve as role models, provide an orientation to the university setting, provide specific course tutoring, and in general assist participants in both the transition from high school to the university and achieving success in coursework. Mentors themselves benefit from the program, developing closer ties with faculty, leadership skills, and confidence in positions of responsibility.

Each group is assigned a faculty advisor. As part of the group sessions, faculty members are invited to attend, both to address specific course needs of the student, as well as more general aspects of the professions and academic life. The relatively informal setting of a mentoring meeting provides an excellent opportunity to establish lasting individual relationships between faculty, students, and mentors. Meetings also provide a forum for invited recruiters and industry representatives to supply information useful in making career decisions. The weekly time also is used to bring other successful upper division students, representatives from student groups, etc.

Example Activities
Two examples point out the utility in tailoring mentoring programs to individual institutional settings. A highlight of the past two year’s evolution of mentoring in computer science at UTPA has been the involvement of the student professional organization. Upon initiation of the current program, the student chapter of the ACM was encouraged to participate through a range of activities, including subject-specific tutoring, presentations to mentoring groups, and hosting social events. The fit was good, with the upper level students finding an avenue for the service elements of their organization, as well as a group of enthusiastic students to recruit from. The student organization has benefited from this set of experiences, culminating in the planning and implementation of a university wide “Computer Science Research Day” last year for which the students found sponsors, including IBM and Gateway, for speakers, food and all expenses for over 200 participants. Mentors hired during the last academic year included the current and past president of the student ACM chapter. Longer term, it seems likely that institutionalization of a mentoring program can be facilitated with such synergistic activities.

A second example is the development of the Student Speaker Series. Mentors reported that there was a much wider interest in speakers we were bringing to the mentoring groups than just entering students, e.g., speakers focusing on professional employment, university procedure such as financial
aid, and reports of senior student research. Following on to the broader interests, mentors have organized over each of the past three semesters a speaker series addressing student interests. Figure 1 below shows the presentations for October and November of this year. An archive of presentation, as well as other information about the program, is available at http://cs.panam.edu/~mentoring/recss.htm. These broadly attended weekly events, which program participants are required to attend, have served as an important means to both provide information and integrate entering students in the larger social and departmental contexts. Both of these examples also point out the secondary impact of the MLC program.

- **October 3**: Career Placement Services - Ricardo Ramirez (ENGR & CS Placement Specialist)
- **October 10**: Scholarship Information - Martha Muniz (ENGR Undergraduate Advisor).
- **October 17**: Human Powered still water (Sr. Project) - Mechanical engineering students.
- **October 24**: Voltage and Current Harmonics of Non-Linear Loads - Viridiana Martinez (EE graduate student).
- **October 31**: Opportunities in Nanotechnology - Dr. Karen Lozano (Assoc. Professor: Mechanical Engineering)
- **November 7**: The Nano Team - Mechanical, manufacturing & electrical students.
- **November 14**: Rapid Prototyping in Design - Dr. Rajiv Nambiar (Assoc. Professor Manufacturing Engineering)
- **November 21**: Antenna watching - Dr. Foltz (Assoc. Professor, Chair, E department chair).
- **November 28**: Algorithms and Programming Strategies - Mark Lagunez (CS Senior).

Figure 1. Schedule of Mentoring and Learning Community presentations

**Cost and Assessment**
A primary goal over the past three years has been to implement and test a program that is sustainable beyond the period of external funding of the current program. The key principles of sustainability have been low cost, broad impact, and program design that facilitates institutionalization. We have chosen not to use widespread participant stipends in large part because of the difficulty in sustaining such costs. We have also found, likely obviously, that the techniques for involving students in programs are quite different with and without direct financial reward, and the past two years without stipends has provided valuable experience. Cost effective student effort is used to deliver the large majority of program services. By far the largest effort is in student-mentor contact hours, but effort in activities such as the speaker series and social engagement is also significant. The success of the program and the derivation of successful techniques appropriate for the institution have demonstrated the utility and cost-effectiveness to others within the institution. For the Department of Computer Science, there is the commitment to fund mentor effort internally, and thus more stably. The goal is that, as experience is gained and success demonstrated, similar internal funding will be committed. As noted above, student organizations might be drawn upon for student contact hours, as they become integrated and involved with the program. The university has recently opened an office of mentoring to complement a university wide learning community approach centered on a new, required course for entering students addressing academic fundamentals. As the office develops, it seems likely that it can take over or supplement mentor training.

In computer science the first course, CS1, is the single most challenging course in the curriculum in terms of success rate. This course is also required of most engineering and science majors at our university and has been designated a “gate-keeper” course in the university’s efforts to increase graduation rates. For last year’s participants in the MLC program, 84% continued and successfully
completed the CS 1 course versus 58% for nonparticipants. Student participants and faculty were surveyed and both groups reported that the program “was an important factor in successfully completing” the first programming course (92% and 100%, respectively) and “continuing study in computer science” (96% and 100%, respectively). Past experience with learning and mentoring communities has provided experience in process evaluation, and rapid correction and redirection of groups throughout the year has enhanced the program’s implementation.

Summary and Conclusions

In summary, the current MLC program applies well-known techniques of mentoring and small group dynamics in the context of at-risk students to increase success rates. The program is designed to systematically supply resources beyond what is provided by the formal academic and university structure that address the needs of students in their challenging and critical first year. The most significant element of the program has been to create a structure for small group interaction that brings entering freshman together with successful upper class students and faculty in a supportive and collaborative environment. Such opportunities for interaction have been supported and extended by creating and facilitating larger groups within which the entering student can interact, learn about departmental and profession culture, and become integrated with these elements of their university experience. The program has also involved existing student organizations with entering students in a more focused manner to the benefit of both. Organizationally and administratively, the MLC program has proven to be a cost-effective means to meet the goals of students and the university.

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References


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