

The Importance of Community for Building Diversity

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I have been interested in issues related to diversity for most of my career, beginning in the late 1980's when I was a graduate student at the University of Illinois at Urbana-Champaign (UIUC). My perspective on this topic comes primarily from two experiences: teaching in retention programs and beginning a research project based on some of the retention literature. The former directly shaped the path that my early career followed, including my philosophy of teaching; the latter is shaping the next phases in my career.

Teaching in Retention Programs

As a graduate student, I taught for two retention programs at UIUC: the Summer Bridge & Transition Program and the Merit Workshop Calculus Program. The Summer Bridge & Transition Program helped to retain students in college (Murphy, 1995). The Merit Workshop Calculus Program helped to keep undergraduates in calculus-based majors (Murphy, Stafford, & McCreary, 1998). Both of these programs served underrepresented students, in different ways, but both emphasized the importance of building a strong academic community among student peers.

The Summer Bridge Program at UIUC

During my first year of graduate school, I was a teaching assistant for large lectures of college algebra. In this context, I worked for two instructors who spent their summers teaching for the Summer Bridge Program. As that summer drew near, they offered me the chance to teach with them for the program. It was such a great, and eye-opening experience, that I spent every summer of graduate school this way, opted to teach for the academic year component as well, and ultimately wrote my Ph.D. dissertation in education about this program.

The Summer Bridge Program at UIUC is an academic support program that serves undergraduates mostly from inner-city Chicago and East St. Louis high schools – providing an opportunity for these students to access prestigious higher education. When I was involved with the program, each year approximately 50 students were selected to participate in the six-week residential session

at the UIUC campus. Students were selected for participation based on high school records, placement exam scores, and personal interviews. They tended to have ACT scores that were, on average, about 10 points lower than the campus average. Many of them had graduated, in the upper tier of their class, from very large high schools that had 50% drop-out rates. Some were the only students from their high school cohorts to be admitted to UIUC. These students were among the most motivated students I have ever worked with – they knew why they were in school.

The Summer Bridge Program was affectionately known by staff and students as “academic bootcamp.” The students agreed to spend six weeks on the UIUC campus, completing classes in English, mathematics, study skills, and an additional topic that was taught in a “large” lecture format to help them adjust to that structure. At night, they attended mandatory study sessions. The program kept them officially busy from 8:00 a.m. to 9:00 p.m. every weekday and almost every weekend, enforcing an environment of high expectations while paying close, personal attention to the success of each student. Community-building was a goal of the entire program. Instructors tended to know even students who weren't in their class in addition to the ones who were. The students certainly all knew each other. Everyone kept tabs on everyone else. The cohesion, and the accountability to each other, was really quite striking. I remember, during one summer session, there was an incident for which a student almost got sent home. The rest of the students petitioned the director, offering to make collective sacrifices if he would let that student stay. The students explained, “50 of us started this summer program and 50 of us are going to finish it.”

The Emerging Scholars Program Model

The Summer Bridge Program opened my eyes to students who had not grown up with the same conditions that I had. My interest in the students compelled me to explore examples of effective support structures. Ultimately, the most influential archetype in my life as a teacher, and later as a researcher, was Treisman's Emerging Scholars Program model. In the 1970s, then graduate student Uri Treisman studied the puzzling failure rates of African

American students in freshman calculus at the University of California, Berkeley. He systematically dismissed common hypotheses such as insufficient preparation, low socio-economic status, and lack of family support. Using ethnographic methods, he observed that African-American students tended to study in isolation, keeping their academic and social lives separate. This tendency contrasted with the apparent habits of their highly successful Chinese classmates, who tended to study together:

“Composed of students with shared purpose, the informal study groups of Chinese freshmen enabled their members not only to share mathematical knowledge but also to “check out” their understanding of what was being required of them by their professors and, more generally, by the University. ...

[Treisman] observed Chinese students in their study groups ask each other questions ranging from whether one

of Emerging Scholars Programs and adaptations (for some examples, see <http://www.math.ou.edu/~tjmurphy/Research/ESPbiblio.html>).

The Merit Workshop Calculus Program at UIUC

The success of the workshop calculus model inspired other institutions to adapt the model. It is believed that more than 150 institutions, ranging from research universities to community colleges, have implemented some version of this model. The Merit Workshop Calculus Program at UIUC is one such adaptation. As with many other adaptations of the model, in the Merit Workshop Calculus Program, students take a large lecture calculus course, but the usual recitation sections are replaced by workshop sessions. During these sessions, instead of asking questions about homework exercises, students work collaboratively on challenging mathematics problems. The intention behind the workshop calculus model is to provide a context that catalyzes the emergence of an academic community.

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was permitted to write in pencil on a test to how one might circumvent certain University financial aid regulations. More important was the fact that these students routinely critiqued each other's work, assisted each other with homework problems, and shared all manner of information related to their common interests. Their collaboration provided them with valuable information that guided their day-to-day study.” (Treisman, 1985, pp. 13-14)

Under the premise that academic community is a key component of student success, Treisman designed the initial version of the Emerging Scholars Program (ESP). A primary feature of the ESP model is “workshop calculus.” At large research universities, freshman calculus tends to be taught in the lecture-recitation format: typically a professor lectures three days per week to a large class (at least 100 students), which is split into smaller groups (perhaps 25 students each) for one or two recitation sessions per week, during which a graduate teaching assistant answers homework questions. In the workshop calculus model, the standard recitation sessions are replaced with workshop sessions, which meet for longer periods of time (perhaps 2 hours instead of 50 minutes) and during which students work collaboratively on challenging mathematics problems. Various articles and reports have been published about the positive effects

The Merit Workshop Calculus Program was started at UIUC in the late 1980's, shortly after I started graduate school. I was already teaching algebra for the Summer Bridge & Transition Program. I was finding that I was very interested in my students and the issues in their lives. So I attended a presentation (in 1990) by the then-director of the Merit Workshop Calculus Program, Paul McCreary, who offered anecdotes and data indicating the level of success that the program was having. I asked him, “If you can do that with calculus students, why can't I do that with algebra students?” He responded, “I don't know. Why don't you try?” – a response that changed my life. In some sense, I am still seeking answers to my question. The journey changed the way I think about teaching, learning, mathematics, and my research interests.

After spending a number of years teaching algebra for the Summer Bridge & Transition Program, and a few years working in instructional development, I finally had an opportunity to actually teach for the Merit Workshop Calculus Program (1995-1996). Like the Summer Bridge Program, the Merit Workshop Calculus Program, under then-director McCreary's guidance, emphasized the importance of building an academic community. A classroom was specially designated for the workshop sessions; bolted-down desks were replaced with tables and chairs. This room became not just where classes were

held, but a place where students met to study in the evenings and on weekends, an academic home. At the beginning of each semester, McCreary took a picture of each student (and each instructor) – he did an incredible job of capturing personality as well as physical appearance in these shots. The pictures were posted in the room above the chalkboards, labeled with nametags, so that everyone in the program could learn everyone else's names.

We had weekly staff meetings (in that room) at which we discussed individual students and their needs, as well as overall program philosophy and strategies. It was at these meetings that I came to consider more deeply ideas about the flow of a semester, about instructional behaviors that could inhibit student growth, about subtle ways to build students' confidence. McCreary encouraged the

Engineering (IE) at OU, more than half of the undergraduate majors are women.

This proportion is almost unheard of in engineering, science, and mathematics degree programs (although mathematics is closer than other science and engineering areas). Unlike at OU, in industrial engineering nationwide, one-fourth of majors are women (U.S. Department of Education, 2000, Table 257.—Bachelor's, master's, and doctor's degrees conferred by degree-granting institutions, by sex of student and field of study: 1997-98). At the University of Oklahoma, the next highest such proportions is 39% in the School of Chemical Engineering (University of Oklahoma Institutional Research and Reporting, 2001, Table 46: Norman Campus Students By College, Major And Level Unduplicated Headcount: Fall 2000). It is particularly

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instructors to concentrate on getting the students to interact with each other, to talk but not just to talk: to share ideas, take risks, argue. He embraced the formation of an academic community as the top priority, believing that mastery of course content would naturally follow. I inherited a lot of this philosophy from him.

Gender Parity: A Research Project

As I mentioned above, I completed my Ph.D. in education by studying the Summer Bridge & Transition Program (Murphy, 1995). Later McCreary and I published an article (Murphy, Stafford, & McCreary, 1998) about the Merit Workshop Calculus Program. In Fall 2001, I started to work with a multi-disciplinary group of faculty at the University of Oklahoma (OU). The group included faculty from the Colleges of Engineering and Education, the Departments of Anthropology and Chemistry, the Women's Studies Program, and myself. One of the faculty in Engineering had an unusual phenomenon that she wanted to study: in the School of Industrial

striking that the proportion of women majoring in IE at OU doubled in the span of four years, from 27% in 1996 to 55% in 2000. We believe that a combination of factors contributed.

To begin to study this phenomenon (NSF Grant-#0225228), we first turned to the work of Seymour and Hewitt (1997). In that project, a team of researchers conducted individual and focus group interviews of 335 students at 7 institutions and additional (data check) focus group interviews of 125 students at six institutions, for a total of 460 students at 13 institutions. In addition to an overall analysis, this book contains a chapter specifically about issues related to gender and another chapter specifically about issues related to race and ethnicity.

One of the points that strikes me the most from Seymour and Hewitt (1997) is that all students benefit from good teaching, but students from traditionally underrepresented populations benefit even more. Our own research project is too young yet for us to make broadly sweeping claims. However, I suspect that this extends into other aspects of

college, such as advising and mentoring. For example, we are learning that, shortly before the jump in proportion of women, IE at OU specifically set out to increase its number of undergraduate majors. The associated special attention that the IE faculty pay to the students is indeed noticed by the students, perhaps disproportionately so by the women.

In particular, students (of both genders) talk about the welcoming environment in IE at OU. IE faculty offices are almost all on the same corridor. At one end of this corridor is the receptionist's desk and at the other end is a room with a table, chairs, and whiteboard – referred to as the "team room." Students in our study have told stories about problems that the receptionist helped them solve (perhaps by seeking out a faculty member or advisor), about times they have walked down the corridor and dropped in to chat informally with faculty, about conversations they have had with faculty about course-taking advice, career paths, research opportunities, and even problems with roommates. Once again, all students can benefit from this community environment, but it is possible that students from traditionally underrepresented populations benefit even more.

Layers of Communities

In our current research project, we have not yet looked into patterns specific to race and ethnicity but that is on our to-do list. One of my ongoing concerns is the tendency in the academic community to approach issues of underrepresentation with monolithic "solutions." Seymour and Hewitt warn:

"The well-publicized failure of minority recruitment and retention initiatives has prompted a search for more effective alternatives. One danger in this second round of initiatives (already discernable in our participants' accounts), is to grasp at over-simple versions of strategies which can be useful when their strengths and limitations for particular purposes and groups are understood. Such is the case with efforts to formalize relationships which, on an informal basis, have traditionally promoted persistence among white male students – most commonly, the organization of collaborative learning, tutorial and workshop programs, and faculty-student mentoring. As we have illustrated, these initiatives tend to mis-fire unless they are based on a culturally-specific understanding, including how peer groups actually work, how to serve students in need of tutorial support without stigmatizing them, and what kinds of mentoring relationships students of color actually need." (Seymour & Hewitt, 1997, p. 388)

My concern is two-fold: on the one hand, sometimes programs that target specific populations are marginalized, while, on the other hand, programs that do not take into consideration the specific perspectives of different populations may not be sufficiently addressing student needs. Thus, while I do think that programs and departments that emphasize community are on to something, I would not want to claim that any particular community will appeal to all students.

In fact, it seems to me, based on my experiences, that students need to have layers of communities. A campus-based community like the Summer Bridge & Transition Program can help institutions to retain and graduate students. Student chapters of special-interest groups might fill this role (e.g., Black Student Association, Association for Women in Science). A calculus-based community like the Merit Workshop Calculus Program can help to keep students in calculus-based majors. A department-based community like IE at OU can help departments to attract and retain majors. I think these statements are true for almost all students, but much more so for students from historically underrepresented populations.

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