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This chapter offers an example of a discipline-specific approach to diversity education and its impact on student learning.

Diversity Education and Identity Development in an Information Technology Course

Eileen M. Trauth, R. Neill Johnson, Allison Morgan, Haiyan Huang, Jeria Quesenberry

One of the major challenges facing today's information technology sector is the diversity of the labor force. Globalization is having a significant influence on the information technology (IT) industry (Walsham, 2000) through offshore outsourcing (Carmel and Agarwal, 2002), global software development (Sahay, Nicholson, and Krishna, 2003), and global information systems management. These new kinds of work, requiring cross-cultural collaboration, demand new sets of knowledge and skills. As opportunities for global expansion and outsourcing increase, so does the demand for greater diversity in the domestic workforce. Recruiting and retaining "the best and the brightest" in the IT field demands that the profession welcome all individuals regardless of gender, race, nationality, or other identity characteristics (Trauth, Huang, Quesenberry, and Morgan, 2007).

A particular educational challenge for universities that are not located in major metropolitan areas rich in demographic diversity is how to prepare those in the future labor force to value diversity and understand the ways in which their behaviors can contribute to or detract from a welcoming climate. In response to this need, Eileen Trauth designed a course titled Human Diversity in the Global Information Economy in spring 2005

when she was a fellow of the Multicultural Teaching Academy, a project sponsored by the Schreyer Institute for Teaching Excellence and the Africana Research Center at Penn State. In this course, first taught in fall 2005, students examined the effects of human diversity on the analysis, development, and use of information systems and technology. They also reflected on their own identities and drew on their experiences of "privilege" and "otherness" to develop solutions to problems faced by workers and clients in IT settings.

Building Diversity into an Information Technology Course

Building on an analytical framework developed for diversity and IT research (Trauth and others, 2006) and an existing framework for culturally inclusive teaching (Wlodkowski and Ginsberg, 1995), the authors created a diversity-focused career preparation course. Through readings, discussions, and team-based case scenarios, students in the course explored multiple diversity issues—including gender, race, sexual orientation, socioeconomic class, and age. Examples of the curricular focus include the following:

- *Gender.* Women are significantly underrepresented in the IT workforce everywhere in the world (Arnold and Niederman, 2001; Camp, 1997). Students discussed gender and Internet behavior, technology and gender stereotypes, and sexual harassment in the workplace.
- *Race.* African Americans, Hispanics, and Native Americans are also underrepresented in the sciences and technology disciplines (BEST, 2004). In-class learning activities asked students to consider the connection between race and technology adoption and how to manage issues that could be present in multiracial project teams. In addition, students participated in an out-of-class, peer-led discussion facilitated by the Race Relations Project at Penn State.
- *Sexual orientation.* Many of our students come from isolated rural communities where sexual minorities are invisible and therefore unknown. This was the first course many of these students had had that addressed sexual orientation.
- *Socioeconomic status.* This topic was explored in terms of the "digital divide," the gap between those who have the resources to participate with information technology and those who do not.
- *Cross-cultural diversity.* In a semester-long assignment, students corresponded electronically with students in one of seven different countries to design a Web-based information tool for users in that country. In their project reports and presentations, students were asked to discuss the sociocultural context of their assigned country, provide the results of their

cross-cultural analysis, and reflect on their cross-cultural virtual work experiences.

Parameters of Course Research

Thematic analysis of two individual reflection papers provides the basis for our discussion of learning gains attained by students who took Human Diversity in the Global Information Economy in fall 2005. In the first assignment, completed in the fourth week of the fourteen-week course, students reflected on their educational and life experiences related to diversity, including their participation in the out-of-class peer-facilitated Race Relations Project. This assignment provided a "baseline account" of each student's thoughts on diversity as well as reflections on the first few weeks of the course. In the second assignment, completed in week 13, students applied what they had learned to determine how best to meet the IT needs of clients and colleagues with identities different from their own. The decision to include this sensitivity to "the other" came from Trauth's prior research into cross-cultural issues (Trauth, 2000) and on gender in the information technology field (Trauth, 2002).

We looked at both assignments for evidence that students had attained three desired learning outcomes: critical analysis of the link between increased productivity and a diverse IT workforce, evaluation of self as an agent or target of discrimination within the larger framework of institutionalized privileges and oppressions, and ability to identify the challenges and needs of diverse IT clients and coworkers in specific cross-cultural contexts. The third outcome was more explicit in the final individual reflection paper. Since most students in the course were white, we applied Helms's U.S. white racial identity development model (1990) in analyzing students' reflections. The Helms model has six stages. The first three (Contact, Disintegration, Reintegration) involve the white subject's attempts to confront and move beyond his or her own racism. Helms links these stages together as Phase 1: Abandonment of Racism. The last three stages (Pseudo-Independent, Immersion/Emersion, Autonomy) Helms labels Phase 2: Defining a Nonracist White Identity. We did not present this model to students in the course; nevertheless, we found the model useful in interpreting students' attainment of the second and third learning outcomes.

Of the thirty-seven students enrolled in the course, twenty-three participated in our research. We defined as the "majority" twelve traditional-age, straight, white males and as the "minority" eleven students consisting of five straight, white females (four of traditional age and one returning adult); three traditional-age, straight, Asian American females; one traditional-age, straight, Asian American male; one traditional-age, white, gay man; and one traditional-age, white lesbian. In our analysis we compared the learning gains of majority and minority students.

Analysis of Student Learning Outcomes

All minority students and over 80 percent of the majority students attained outcome 1, critical analysis of the link between increased productivity and a diverse information technology workforce. Most students noted that the course had expanded their definition of diversity beyond race and gender to include such things as socioeconomic status, age, ability, sexual orientation, and religion. Most also responded positively to the evidence presented in course readings and in class sessions connecting creativity and business success to diversity broadly defined. Several students provided well-argued critiques of particular articles and guest lecturers, but they found the evidence persuasive on the whole. Only two majority students rejected the evidence entirely. Although their arguments were not well researched, we were pleased that these two men were able to express their dissent.

Far more typical was the reflection of a minority student who contrasted this course to humanities courses that "dealt with race in very emotional ways" and concluded, "Although I've learned a great deal about people who are different from me in those classes, I was very happy to finally see diversity dealt with in an unemotional, academic fashion in this class. I am not particularly interested in blame games—I just want solutions to social inequalities." Thus a discipline-specific research context seems to have been equally important to majority and minority students.

All students made some progress toward the more challenging outcomes 2 and 3: self-evaluation as agent or target of discrimination and ability to identify information technology challenges and needs of an "other."

The four majority students who showed the most significant learning gains on outcome 2 were able to observe their own identity conflicts and growth in terms we can recognize through Helms's stages of white racial identity development. For example, one student writes, "I thought that after three years in college I had a broad outlook on life and I was open to diversity. After the race relations course [to] which I was assigned, I realized that I am back in my bubble and have surrounded myself with people of similar backgrounds as myself." He goes on to talk about how his fraternity discriminates on a number of fronts and how he intends to change that as an older member. Students like these are clearly aware of their white privilege as a result of their experiences in the course.

For four of the eleven minority students, the outcome 2 learning gains are expressed in terms of a new understanding of and empathy for those with a majority perspective attained through critical analysis of their own cultural advantages. Contrary to our expectations, the minority students who had considered themselves most culturally advantaged (they had the most exposure living or interacting in diverse communities) at the start of the course were those who showed the most significant learning gains with respect to analysis of self as agent or target of discrimination. Typical of this subgroup is the reflection of the white lesbian student: "One of the most

insightful experiences for me in this class was finally talking about diversity with people who weren't already diversity-trained. Just as I have almost always talked about gay issues with only gay people, I have spent hours discussing race relations among people of all races—except other white people. Class discussions and the Race Relations Project were large eye-opening experiences for me to learn what my fellow students believe." One of the things that her majority classmates taught her is that the digital divide affects people in rural areas, too—that access to technology is not only a concern for poor urban people but also for rural people of widely varying economic means. They also helped her avoid putting a "race" label on issues that are really about socioeconomic status.

For the final individual reflection paper, ten of the eleven minority students and ten of the twelve majority students creatively outlined the needs of information technology workers and users who have multiple identities very different from their own (outcome 3). Although their solutions were not always the most equitable, these students genuinely tried to put themselves into others' shoes as they imagined difficulties their characters would encounter on the job as well as needs they would have as IT clients. Each of the three exceptions created a worker or client who was a thinly disguised image of that person or a close relative. These are safe subjects for analysis, but they do not encourage creative problem solving outside one's own cultural or socioeconomic comfort zone.

Lessons Learned and Implications for Future Research and Teaching

The one consistent finding across all participants in the study is that students were more receptive to diversity education when it was presented in the context of the discipline. We also discovered that it is possible for students to make progress in their racial identity development over the course of one semester. Tatum (1992) states that it is not only possible but even "common to witness beginning transformations in classes with race-related content" (p. 18). In our study, one third of the students reported what we consider a remarkable transformation. The reflective papers of one third of our "culturally disadvantaged" majority students provide evidence that the course was for them a catalyst for substantial self-realization. In addition, we were surprised that about the same proportion of minority students (arguably those most culturally advantaged at the beginning of the course) reported significant learning gains in understanding the majority perspective and developing empathy for their majority peers.

Future research should investigate whether identity models for non-white and other minority populations (black racial identity development models, sexual minority identity development models, and so on) are helpful in assessing the learning of minority students in such career development courses. The present research sample had only one population large enough to apply a particular identity development model. However, we believe that

students tend to focus only on the identity that is most salient for them at the moment. For example, the salient issue for the four traditional-age, straight, white women in this study was gender, not race. These women made few gains in terms of white racial identity development, perhaps because they were focused on their minority status as women in a male-dominated discipline. However, studies with a larger number of participants would reveal whether such women's learning gains would be comparable in kind and proportion to those of their male counterparts.

Finally, faculty who develop courses such as Human Diversity in the Global Information Economy would be well advised to design learning activities that challenge students to examine their own identity in terms of power and privilege as a necessary correlate to doing research on the relationship between diversity, creativity and inventiveness, and success.

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EILEEN M. TRAUTH is a professor of information sciences and technology and director of the Center for the Information Society at the Pennsylvania State University.

R. NEILL JOHNSON is a research associate of the Schreyer Institute for Teaching Excellence at the Pennsylvania State University.

ALLISON MORGAN, HAIYAN HUANG, and JERIA QUESENBERRY are Ph.D. candidates and teaching fellows in the College of Information Sciences and Technology at the Pennsylvania State University.