

National Center for Women & Information Technology

PROMISING PRACTICES

The Conversational Classroom (Case Study 1)

Retaining Women through Inclusive Pedagogy



Undergraduate



Graduate

This intervention, tested and repeated at the University of Colorado with excellent results, is based on the rationale that students could read their assigned books where the content of the course was clearly laid out. They did not also need for the professor to plan and deliver lectures covering the same material. Instead, they needed access to the professor and each other for asking questions, testing hypotheses, exploring new ideas, etc. In short, professors believed that students needed to engage each other and the professor in intellectual conversation about the material. Therefore, the professors facilitated discussions of the material for each class period. That is, instead of lecturing, professors come to class and ask students if they have questions. In this way, the professor requires that students take control over the flow of information.

The first time he used the Conversational Classroom method, University of Colorado Professor William Waite says that students resisted very strongly; their years of socialization made it difficult to change the way they practiced learning. But, it was also difficult for Waite; he came close to buckling under student pressure. After four weeks, however, students began to take responsibility for their own learning.

Computing faculty today face many pressures to integrate collaborative and cooperative learning approaches in courses, increase active participation by students in classes, and increase the participation of under-represented groups in computing. The pressures come from many sources, such as the emphasis on team work by the Accreditation Board for Engineering and Technology, the Joint IEEE Computer Society/ACM Task Force in the "Model Curricula for Computing," and especially, industry. Research in computer science suggests that when a student's educational socialization is dominated by individualized learning



and homework, they end up with a preference for working alone, tend to procrastinate, are unwilling to support other students, and have a disregard or lack of understanding of team process. This "guide on the side" teaching technique can overcome students' negative conceptions of collaborative learning.

EVALUATION

Although the examinations and homework assignments given were judged to be identical in difficulty to prior semesters when the course was taught as a traditional lecture course, students in the conversational classroom outperformed the prior semesters' students, both during the pilot semester and a subsequent semester. Not only was student interaction a substantial feature of the course, changing classroom climate (for the better, according to student interviews), but student performance also improved.

GENERAL PRINCIPLES AND ESSENTIAL INGREDIENTS

This teaching model requires that students take responsibility for their learning. They will resist because of many years of deeply ingrained socialization. Professors also must hold out and resist the demands of students to go back to the lecture mode. It is worth it, according to the professors who have implemented this intervention. Not only do students learn the material better, but the course structure also requires that they engage with the professor and their fellow students, two known factors in increasing the retention of women in computing.

RESOURCES

- Waite, W., Jackson, M., & Diwan, A. (2003). The conversational classroom. *Proceedings of the 34th SIGCSE Technical Symposium on Computer Science Education*, 127-131.
- Waite, W., Jackson, M., Diwan, A., & Leonardi, P. (2004). Student culture vs group work in computer science. *Proceedings of the 35th SIGCSE Technical Symposium on Computer Science Education*, 12-16.

NCWIT offers practices for increasing and benefiting from gender diversity in IT at the K-12, undergraduate, graduate, and career levels.
This case study describes a research-inspired practice that may need further evaluation. Try it, and let us know your results.

ncwit.org Authors | Lecia Barker and J. McGrath Cohoon
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PROMISING PRACTICES

How Do You Recruit or Retain Women Through Inclusive Pedagogy? with Case Study 1



Undergraduate



Graduate

Physiology is important, but learning occurs within social environments, and it is mediated by the communication norms of those environments. As NCWIT Social Science Network member Margaret Eisenhart and colleague Elizabeth Finkel wrote, learning develops when one “changes from novice to expert, newcomer to old-timer, or naïve to mature practitioners in a social practice such as the activities of a science curriculum or an engineering workplace” (p. 8).

Decreased confidence among women is a frequently recurring theme in STEM and IT research. Women are more likely than men to lose confidence in their ability to complete the tasks required for earning acceptable grades, even when their performance is equal to males’. This loss of confidence can result from the suggestion that women do not fit the image of “scientist” or “engineer.” We know that students and professors maintain mental models of the types of people who belong and what they can or should contribute. For example, two studies in engineering showed that despite entering their engineering majors with stronger academic preparation than their male peers, women were often considered less capable academically, or even described as “not the real engineering type.” Not surprisingly, women in these studies eventually came to view themselves in the same way, resulting in either dropping out or practicing on the margins in their project groups. With repeated (and often subtle) messages that one is not like the other students—not as smart, not interested in the same activities, not a “real” computing major—it becomes difficult to imagine oneself developing the identity of a computer scientist.

Classroom opportunities for holding intellectual conversations can help to alleviate the loss of confidence among women, while allowing them to develop support groups and networks of intellectual support. Hearing other students talk about what they are learning gives women better information for making judgments about whether they in fact do belong there. And, other students hearing women’s intellectual talk forces them to recognize that women are competent contributors to the intellectual enterprise.

WHERE WE LEARN SHAPES OUR LEARNING

Both the physical and the social aspects of a learning environment influence student participation and satisfaction, as well as learning itself. For example, when students’ seats are bolted to the floor facing a lectern, student collaboration can be inhibited.

An important aspect of a classroom learning environment is the communication climate. When instruction is mainly lecture-based with few or no opportunities for interaction, students have little expectation that they will, can, or should learn from each other. Under these circumstances students may resist different teaching methods such as student-led discussion or small group-work. Studies show, however, that with effective teaching, small group-discussion enables students to effectively internalize and apply interpretive procedures. Hearing other students talk about the concepts being taught has many benefits. Especially important in this process are the supportive relationships and the network of learning partners students can develop. So, despite the years of socialization and expectations that students (and instructors) bring with them, new routines can quickly develop into new norms.

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RESOURCES

Eisenhart, M. & Finkel, E. (1998). *Women’s science: Learning and succeeding from the margins*. Chicago, IL: University of Chicago Press.

Hiemstra, R. (1991). Aspects of effective learning environments. In R. Hiemstra (Ed.), *New Directions for Adult and Continuing Education* (pp. 5-12). San Francisco, CA: Jossey-Bass.

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Visit www.ncwit.org/practices to find out more.

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