DEVELOPING WOMEN’S STUDIES IN A TECHNOLOGICAL INSTITUTION

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(A) Introduction

Over the past thirty years, the impact and interaction between the emerging interdisciplinary field of women’s studies and the proliferating technological disciplines has increased from non-existent to minimal. In many respects, the paucity of cross-over reflects the dearth of women in science, engineering, and technology, in general, and the particular identification and intertwining of technology with masculinity in US culture.

Although women have increased in numbers of degree-recipients at both undergraduate and graduate levels within the biological and social sciences, the numbers of women among degree-recipients in the physical sciences, engineering, and computer science have actually reached a plateau or decreased in recent years (AAUW, 2000; NSF, 1999). Further, the number of women receiving doctoral degrees in scientific and technological fields over the past three decades has not translated into expected representation of women in faculty ranks, especially at the senior level, over time (Fox, 1999, 2001a). During this same thirty-year period, however, the US economy has become increasingly focused upon science and technology, and current and projected increases in the more lucrative portions of the workforce, in areas such as information technology, biotechnology, and engineering, reflect this focus (see Fox 2001b).

As feminist science and technology scholars have lamented, the impact of science and technology on women’s studies has been negligible (Fausto-Sterling, 1992, 2000; Quinby, 2001; Rosser, 1988, 1997, 2000, 2001). Since women’s studies originated in the humanities, spreading secondarily to the social sciences, faculty from disciplines in the humanities continue to predominate in women’s studies teaching and scholarship. Recognizing the need for women’s studies critiques in science and technology and acknowledging the void in women’s studies caused by the absence of scientists and engineers, some have worked to build the “two-way street” needed to connect women’s
studies with the scientific and technological communities, as first articulated by Fausto-Sterling (1992).

Building women’s studies at a technological institution provides one model for such a “two-way street.” The creation and implementation of The Center for the Study of Women, Science, and Technology (WST) at the Georgia Institute of Technology (Georgia Tech) (http://www.wst.gatech.edu) illustrates the potential and positive influences and interactions that women, gender, and women’s studies can have on scientific and technical disciplines, and suggests ways that a focus upon science and technology can build curriculum and research for women’s studies.

Many see WST and its component programs as a critical component to attract and retain women at Georgia Tech.¹ The WST Center grew out of a curricular minor, which is still active. It currently coordinates campus programs open to all students, faculty, administrators, and guests, including research panels, lectures, and workshop. WST also underwrites undergraduate and graduate research partnerships, and jointly sponsors (with the Department of Housing) an undergraduate residential learning community for female students.

(A) WST Curricular Minor

Like faculty at many other universities in the 1970s, professors in Georgia Tech’s humanities and social science programs developed courses on gender and social inequality in response to growing student interests in women’s studies and in minority studies. The 1990 founding of the Ivan Allen College (IAC), which connected the School of Management with transformed humanities and social sciences units, created the first liberal arts degree programs at Georgia Tech. In tandem with establishing interdisciplinary science and technology major courses and degrees, IAC faculty revised core curricular and elective courses, including those on gender and social inequality.
Four faculty members within two IAC units, the Schools of History, Technology, and Society (HTS) and Literature, Communication, and Culture (LCC), developed the Women, Science, and Technology (WST) minor in 1995. The first iteration of the WST minor involved packaging together already taught courses into a logical sequence of interdisciplinary requirements. The first jointly sponsored minor curriculum at Georgia Tech, the WST minor program is the nation’s only women’s studies curriculum focusing on the study of gender, science, and technology.

Administrators and faculty in the units contributing to the program favored the economic expediency of the WST minor: no new courses were created, no new faculty-lines were created, and no new costs were associated with creating or revising the minor. Colatrella and Fox volunteered to serve as co-coordinators for the WST minor, supervising the curriculum and advising students, without any increase in salary or other benefits.

In 1995, Fox applied for and received funding from the Georgia Tech Foundation (GTF) to underwrite WST student-faculty research partnerships. WST minor faculty were encouraged to sponsor undergraduate and graduate students assisting with faculty research in the gender studies of science and technology. The $15,000 GTF grant supported 20 faculty-student partnerships over a four-year period and sponsored programs connecting students, faculty, administrators, and alumnae/i.

Students minoring in WST—whether women or men—come from sciences, engineering, social sciences and the humanities. In theoretical emphases, WST minor courses encourage students to think about values associated with scientific culture, to reflect upon the diverse human side of science and technology, and to deal with social factors affecting participation and performance in scientific and technical occupations and institutions. Students in WST courses study the cultural, social, and historical dimensions of science and technology and find that focusing on gender and social inequality enhances
their understanding of their disciplinary majors. The WST courses encompass titles including “Science, Technology, and Gender,” “Science, Technology, and Race,” “Sociology of Gender,” “Women and Gender in the United States,” and “Women in Science and Engineering.” Students provide testimonial to the value of these classes in their course evaluations and office visits and advising with WST faculty. They particularly identify how WST classes complement their study of science and engineering and the ways feminist analyses relate to their experiences, recognizing gender studies as deepening “their understandings of themselves and others” (see Steneck, Olds, and Neeley forthcoming).

In a practical sense, the WST program prepares students to understand factors such as current work and professional environments, to become equipped to deal with them, and to assume leadership roles toward improved participation among women and men in science and technology. Many upper-level courses at Georgia Tech require team projects. WST courses consider theoretical and practical issues associated with creating diverse teams, allowing students to develop important team-building skills to use in other courses and in their careers. Students are also encouraged to apply for WST’s research partnerships, or research partnerships offered by various Georgia Tech Colleges.

\[\text{A} \] Center for the Study of Women, Science, & Technology

From the onset of the minor, many WST students reported the value of research partnerships and many faculty throughout Georgia Tech were interested in expanding the network of faculty researchers to reach beyond Ivan Allen College. In addition, three particularly significant projects in the late 1990s included WST principals: an institute-wide study of gender, a study of the College of Engineering, and an ad hoc group advocating for the creation of a campus women’s center. In 1995, Georgia Tech researchers began studying the campus climate as part of an NSF grant that led to a comprehensive report describing the environment for women faculty at GT from 1993 to 1998.
The College of Engineering created a task force to look at gender equity and related issues, producing a report in 1998, Enhancing the Environment for Success: Report from the Task Force for Opportunities for Women in Science and Engineering (http://www.coe.gatech.edu/publications). In 1996, a group of students, faculty, and administrators worked together to persuade the President to establish the Women’s Resource Center, created in 1998 and later to fund the hiring of a full-time director in 1999 as a new staff appointment in Student Affairs (http://www.womenscenter.gatech.edu).

In 1999, creating an academic research center focusing on women, science, and technology became a priority for the WST minor co-coordinators (who took on new roles as center co-directors) and for the incoming dean of Ivan Allen College. The WST co-directors worked together with administrators in Ivan Allen College and the Colleges of Engineering and Science on formulating the plans for the center. Supported by the Colleges of Engineering and Sciences and endorsed by the incoming dean of IAC, increased funding was sought from the Georgia Tech Foundation to support student partnerships and programmatic initiatives; and an award was received through the competitive, peer-reviewed Focused Research Program, coordinated by the Vice Provost for Graduate Studies and Research. These helped to launch the Georgia Tech Center for the Study of Women, Science, and Technology.

The Center for the Study of Women, Science, and Technology links issues in the study of science and technology with those of gender, culture, and society. The Center brings together faculty and students, addressing issues of gender, science, and technology in research and programmatic initiatives. In key characteristics, the WST Center is 1) interdisciplinary; 2) collaborative across Georgia Tech Colleges and in alliances with
Atlanta-area colleges and universities and Georgia Tech alumnæ; and 3) cooperative in partnerships with students.

{B} **WST Programs and Initiatives**

The **WST Focused Research Program** extends and coordinates research on women, science, and technology; enhances faculty connections; supports research collaborations among faculty and students; and provides critical, continuing bases for research-based practice and policy for improved participation and performance in scientific and technological education and careers.

The **WST Center Focused Research Panels**, held each semester, feature faculty research on gender, science, and technology. Past programs have focused on the statistical analysis of admissions related to gender and race in engineering, the social implications of information technology, the professional career and reputation of Marie Curie, gender variations in aging and athletic performance, and international perspectives on gender, science, and technology.

Twenty-seven faculty across all six Georgia Tech Colleges participate in the program. The publications of faculty in the WST Focused Research Program, limited to those on women, science, and technology for academic years 1999-2001, appear as a bibliographical resource in Appendix 1. The WST Focused Research Program has taken strides to strategically mobilize research connections, and build upon individual research initiatives—expanding collaboration and enhancing external support. In academic year 2000-01, seven grant proposals were submitted by WST Center faculty to external agencies. Four proposals were funded, and the total of these externally funded projects is over $4 million.

Building on the successful program of WST minor faculty-student partnerships, WST Center **faculty-student partnerships** are key to the program. Undergraduate student
partners from a variety of programs work with individual faculty on research projects. In addition, WST graduate partners work with the WST Co-directors on programs and initiatives. The WST graduate partners help coordinate and publicize the research and programmatic activities of the WST Center, including the events and informal advising for the WST Learning Community (described below). The student-faculty partnerships support students’ intellectual growth, activism, leadership, and partnership in the community of Georgia Tech. The WST initiative aims to launch students for a lifetime of learning and productivity.

The WST Reading Group provides another structured opportunity to discuss ideas, enhance research networks, and promote collaboration and curricular innovation in gender and technology. In founding the reading group in 1999, a senior faculty member agreed to invite diverse faculty affiliated with WST to join the group. At the time of this writing, the group has thrived for two and one half years. A direct outcome from the group is a new book series with the University of Illinois Press on Women, Gender and Technology (see Appendix 2). All three series editors come from the WST Reading Group; and the inaugural volume will contain chapters written primarily by group members.4

(C) WST Center Annual Activities

Lectures: Each year, the WST Center has sponsored a lecture series with expert, outside speakers, focusing upon a central topic. The first WST lecture series focused upon restructuring education for inclusiveness in science and engineering; the second year, upon women, computing, and information technology; and the third year, upon international and global dimensions of women, science, and technology. To attract faculty and students from the constituent colleges of the WST initiative, speakers come from a range of disciplines and address topics that are interdisciplinary and build bridges among disciplines and between faculty and students.
Reception: At the beginning of the academic year, WST co-sponsors (with the Women’s Resource Center) a reception, introducing and honoring new women faculty and administrators, and the students and mentors of the WST Learning Community. The program begins with welcoming remarks from the Provost and the Vice President for Student Affairs, and includes remarks from the Dean of Students, the Women’s Resource Center Coordinator, and the WST Co-Directors.

Town Hall: As part of the events during Women’s Awareness Month (WAM), the Georgia Tech version of Women’s History Month, the WST Center sponsors a town hall on gender equity bringing together faculty, students, and administrators in a forum designed to share new information and programs available on campus and to provide the opportunity for a broad campus conversation on what is needed at Georgia Tech.

Kavita Philip, assistant professor who has participated in the WST Center since its inception, notes the impact of the programs:

The WST Center has significantly altered my campus experience. When course readings set [students] alight with a newfound feminism, I need no longer tell them to browse the web in search of community. We have an active, energetic community of women students working on a daily basis. The WST Center has given me the chance to interact with colleagues across campus around the issue of feminism in science. Finally, an active colloquium series is essential to the vitality of any research program.

{C} WST Learning Community

Modeled on residence halls for women in science at the University of Michigan, Rutgers University, and Purdue University, the Women, Science, and Technology Learning Community is a joint venture of the WST Center and the Georgia Tech Department of Housing. The Georgia Tech WST Learning Community enhances the academic and professional development of resident undergraduates from all majors, and it provides an academic and social network that enriches the quality of campus life for all.
Following on the successful Freshman Experience program sponsored by Georgia Tech Housing, sophomore and junior students live together in a residence hall and participate in programs for women entering scientific and technological fields that “enhance for success.” These programs include workshops, informal discussions⁵, and a pairing of each student with a faculty mentor from a discipline related to the student’s major. In addition, students living in the WST Learning Community create informal peer study and social groups. WST Center graduate partners have an office in the residence in which they hold afternoon office hours and work on WST Center and WST Learning Community events. WST Learning Community students and student partners also attend WST Center lectures and focused research panels (described above), which include receptions where they can converse with faculty mentors and other interested students, faculty, and alumnae/i.

WST Learning Community students are high achievers who are interested in doing well academically, living with others who are serious about their studies, and engaging informally with faculty and mentors, especially toward topics that link curriculum and careers. Christi Lurie, sophomore bioengineering major, enthusiastically participates because the program improves the environment: “It’s nice to be around others that deal with the same problems and issues as a female college student . . especially at Tech. The encouragement and support are constant reminders that I actually can do this.” Aisha Avery, sophomore in industrial engineering, speaks to the strength in diversity: “WST is a community that encourages women from all backgrounds to come together for networking, stimulating conversation, and academic, as well as emotional, support.”

The WST Learning Community was founded in 2000-01, and expanded in its second year with 24 students⁶ in residence, 24 faculty mentors, and 20 other undergraduates also participating in programs. Plans for 2002-2003 call for doubling the current number of
students in the WST Learning Community and increasing the number of WST faculty mentors.

{A} Outreach and the Future

Georgia Tech’s WST program maintains many connections with related programs in the Atlanta area. These include WST faculty’s connections on the advisory board for a Ford Foundation-funded project at Spelman College; participation in the National Conference on the Ph.D. in Women’s Studies held at Emory University; review of the Women’s Studies Program at University of Georgia; an appointment as Rockefeller Fellow in Public Culture at Emory University; cross-listing of courses with Agnes Scott College; and participation in the meeting among Atlanta-area institutions with women’s studies programs, which endorsed creating a research consortium.

WST programs enhance the campus-climate by eradicating barriers—between students, faculty, and students and faculty—and by providing structured research, educational, and programmatic initiatives that rest on collaboration and cross-disciplinarity, and are explicitly linked to science and technology. WST collaborates in research, education, and programmatic initiatives across all six Georgia Tech Colleges (Ivan Allen College of Liberal Arts, Architecture, Computing, Engineering, Sciences, and Management). WST complements the success of Georgia Tech’s Center for Education in Science, Mathematics, and Computing (http://www.ceismc.gatech.edu), which focuses upon K-12 education; and often partners with Student Affairs, Housing, and the Women in Engineering program (http://www.coe.gatech.edu/wie/) to promote education and diversity.

That the WST program, centered upon increasing access and opportunity, can be woven throughout the fabric of Georgia Tech’s institutional structure is testament to feminism’s flexibility and to the possibility of enhancing values and outcomes associated with science and technology on other campuses. Within a technological institution in which
most students pursue a tightly structured curriculum with few electives, students’ exposure to feminism through WST serves crucial, related functions. Feminism serves as a liberal art that broadens the education of students in science and engineering, providing them with analytical frameworks to critique and understand the knowledge in their technical courses. Feminist theories and pedagogies also become prime means to attract and retain men of color and women in science and technology by providing perspectives in the historical, social, and cultural contexts of the science and engineering disciplines in which they pursue their daily work.
NOTES

1 Thirty years ago, Georgia Tech had very few women students or faculty; in 1972-73, only 6.06% of the students were women. Because many concluded that the dearth of women resulted from the limited majors available in engineering, sciences, and architecture, active recruitment of women was encouraged. By 1978, the percentage of women climbed to 18.29%. In 2001-2002, 29% of the students are women. Thanks go to the Georgia Tech Director of Institutional Research for help in providing these data.

2 A WST minor must complete two required courses and four elective courses in HTS and LCC. Sample topics covered in WST Minor courses include: women in the history of science and technology; organizational influences affecting the participation of women in scientific and technological careers; gender issues in professions; women and the organization and management of science and technology; the gendered impact of scientific and technological policy; feminist perspectives on science and technology; and cultural analyses of gender, race, and class factors in the practice of science and technology.

3 Funding from the Georgia Tech Foundation was for a three year period (1999-2001): renewal in each year is based upon results from the prior year and plans and prospects for the next. Funding through the Focused Research Program was obtained in 1999, 2000, and 2001: in each year, the awards were made through a competitive, peer-reviewed process. These awards represent funding that is internal to the institution. Externally funded research projects are discussed subsequently.
In addition to defining the parameters for volumes in the series, writing the inaugural volume provides collaborative opportunities for junior faculty to receive some mentoring from more senior faculty.

The monthly dinner workshops (supported by WST Center) and weekly lunches (underwritten by the Department of Housing) for the WST Learning Community are open to all students on campus. Topics of the workshops vary each term and have recently included discussions of campus climate, strategies for success, work-life of an academic engineer, a history of feminist politics, women in oceanography, and possible career options in industrial engineering.

The 2001-02 WST Learning Community includes 11 Engineering students, 5 in Ivan Allen College, 4 in Sciences, 2 in Computing, and one each from Architecture and Management.


APPENDIX 1:

WST Focused Research Group Publications, 1999-2001

Note: Updates on these references to WST publications can be found at <www.wst.gatech.edu>


Usselman, Marion. 1999, “InGEAR: Integrating Gender Equity and Reform.” Poster at NSF Program for Gender Equity PI Meeting.

Usselman, Marion, and D. Whiting. 1999. “SummerScape: Gender Equitable Science for Students and Teachers.” Poster at NSF Program for Gender Equity PI Meeting.


APPENDIX 2:

Women, Gender, and Technology Book Series

Published by University of Illinois Press

Series Editors: Sue V. Rosser, Mary Frank Fox, and Deborah Johnson

Volumes in the *Women, Gender, and Technology* Series bring together women’s studies and technology studies, focusing upon women and technology, feminist perspectives on technology, and/or the gendering of technology and its impact upon gender relations in society. Volumes may be written from multiple perspectives and approaches, reflecting and aimed toward audiences including women’s studies, science and technology studies, ethics and technology, cultural studies of science and technology, history of technology, and public policy.

Topics focus upon:

- Cultures and societies: comparative approaches in the study of gender, science, and technology; representations of gender and technology; politics and the state as they reflect and reinforce patterns of gender, science, and technology.

- Institutions: gender in technological training; structures of education and outcomes; work and organizational contexts among women in technology; programs and interventions to support gender equity.

- Individuals: social psychology of gender, science, and technology; interactions, expectations, identities, and networks as they are embedded in institutions (e.g., education and work) and outcomes of science and technology; effects of technology on human development and life-span development between generations.

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