Women and Underrepresented Groups in Higher Education

Women and minorities have been historically underrepresented in the academy. While progress toward equitable representation is being made in the humanities and social sciences, science, technology, engineering and mathematic (STEM) disciplines are moving much more slowly toward diversifying faculty and students. These references address issues of equity in higher education, with an emphasis on STEM fields. Specific topics include differential resources, hostile climates, critical mass, best practices for persistence, quantitative demographic reports, qualitative data documenting cultural norms, mentoring and the social construction of science and technology.

Aguirre, A. (2000). *Women and Minority Faculty in the Academic Workplace: Recruitment, Retention and Academic Culture*. San Francisco: Jossey-Bass.

Allen, H. (1998). Faculty Workload and Productivity: Gender Comparisons. *The NEA 1998 Almanac of Higher Education*, 29-44.

Allison, P. D., Long, J. S., & Krauze, T. K. (1982). Cumulative Advantage and Inequality in Science. *American Sociological Review, 47*(October), 615-625.

Ashcraft, C., & Blithe, S. (2010). *Women in IT: The Facts*. Boulder: National Center for Women in Technology (NCWIT).

Avison, D., & Myers, M. (1995). Information Systems and Anthropology: An Anthropological Perspective on IT and Organizational Culture. *Information Technology and People, 8*(3), 43-56.

Barker, D., & Feiner, S. (2009). Affect, Race and Class. *Frontiers: A Journal of Women Studies, 30*(1), 41-54.

Barker, D. K., & Feiner, S. (2004). *Liberating economics: feminist perspectives on families, work, and globalization*. Ann Arbor: University of Michigan Press.

Barker, L., & Garvin-Doxas, K. (2002). *Defensive Climate in the Computer Science Classroom.* Paper presented at the 33rd SIGCSE Technical Symposium on Computer Science Education, New York.

Barker, L., & Garvin-Doxas, K. (2003). *Why Project Courses Sometimes Widen the Experience Gap Among Students.* Paper presented at the 8th Annual ITiCSE Conference on Innovation and Technology in Computer Science Education, Thessaloniki, Greece.

Barker, L., & Garvin-Doxas, K. (2004). Making Visible the Behaviors that Influence Learning Environment: A Qualitative Exploration of Computer Science Classrooms. *Computer Science Education, 14*(2), 119-145.

Barker, L., Garvin-Doxas, K., & Roberts, E. (2005). *What Can Computer Science Learn from a Fine Arts Approach to Teaching?* Paper presented at the 36th SIGCSE Technical Symposium on Computer Science Education, St. Louis, Missouri.

Barker, L., McDowell, C., & Kalahar, K. (2009). Exploring Factors that Influence Computer Science Introductory Course Students to Persist in the Major. *ACM SIGCSE Bulletin, 41*(2), 282-286.

Bart, J. (2000). *Women succeeding in the sciences: theories and practices across disciplines*. West Lafayette, Ind.: Purdue University Press.

Bellas, M., & Toutkoushian, R. (1999). Faculty Time Allocations and Research Productivity: Gender, Race and Family Effects. *The Review of Higher Education, 22*(4), 367-390.

Bender, K., & Heywood, J. (2005). Job Satisfaction of the Highly Educated: The Role of Gender, Academic Tenure and Earnings. *Scottish Journal of Political Economy, 53*(2), 253-279.

Beoku-Betts, J. (2005). 'A Lot of Them Thought I Wouldn't Last There': African Women and Career Advancement. *Journal of Technology Transfer:, Vol 30*, 397-407.

Beverly, J. (2007). Supporting STE Careers From Cradle to Grave: An Interview with Shirley Malcom. *bridges, 16*. Retrieved from http://www.ostina.org/content/view/2744/835/

Bielby, W. (1991). Sex Differences in Careers: Is Science a Special Case? In H. Zuckerman, J. Cole & J. Bruer (Eds.), *The Outer Circle: Women in the Scientific Community*. New York: W.W. Nortom & Company.

Blickenstaff, J. C. (2005). Women and Science Careers: Leaky Pipeline or Gender Filter. *Gender and Education, 17*(4), 369-386.

Brainard, S., & Carlin, L. (1998). A Six-Year Longitudinal Study of Undergraduate Women in Engineering and Science. *Journal of Engineering Education, 87*(4).

Bray, F. (2007). Gender and Technology. *Annual Review of Anthropology, 36*, 37-53.

Burack, C., & Franks, S. (2004). Telling Stories About Engineering: Group Dynamics and Resistance to Diversity. *National Women's Studies Association, 16*(1), 79-95.

Cain Miller, C. (2010). Out of the Loop in Silicon Valley. *The New York Times*. Retrieved from http://www.nytimes.com/2010/04/18/technology/18women.html

Carlone, H., & Johnson, A. (2007). Understanding the Science Experiences of Successful Women of Color: Science Identity as an Analytic Lens. *Journal of Research in Science Teaching, 44*(8), 1187-1218.

Ceci, S., Williams, W., Barnett, & Susan. (2009). Women's Underrepresentation in Science: Sociocultural and Biological Considerations. *Pschological Bulletin, 135*(2), 218-261.

Chesler, N. C., & Chesler, M. A. (2002). Gender-Informed Mentoring Strategies for Women Engineering Scholars: On Establishing a Caring Community. *Journal of Engineering Education, Vol. 91*(No. 1), pp. 49-55.

Clewell, B., & Campbell, P. B. (2002). Taking Stock: Where We've Been, Where We Are, Where We're Going, *Journal of Women and Minorities in Science and Engineering* (Vol. 8, pp. 255-284).

Clewell, B. C., & Ginorio, A. B. (1996). Examining Women's Progress in the Sciences from the Perspective of Diversity. In C.-S. Davis, A. B. Ginorio, C. S. Hollenshead, B. Lazarus & P. M. Rayman (Eds.), *The Equity Equation: Fostering the Advancement of Women in the Sciences, Mathematics and Engineering*. San Francisco: Jossey-Bass Publishers.

Cohoon, J. M. (2001). Toward Improving Female Retention in the Computer Science Major. *Communications of the ACM, 44*(5), 108-114.

Cohoon, J. M. (2002). Recruiting and Retaining Women in Undergraduate Computing Majors. *SIGCSE Bulletin, 34*(2), 48-52.

Cohoon, J. M. (2007). *Gendered Experiences of Computing Graduate Programs.* Paper presented at the 38th SIGCSE Technical Symposium on Computer Science Education, Covington, Kentucky.

Cohoon, J. M., Wu, Z., & Chao, J. (2009). *Sexism: Toxic to Women's Persistence in CSE Doctoral Programs.* Paper presented at the 40th SIGCSE Technical Symposium on Computer Science Education, Chattanooga, Tennessee.

The Committee on Equal Opportunities in Science and Engineering. (1998). *Biennial Report to United States Congress, The Committee on Equal Opportunities in Science and Engineering*. Retrieved from http://www.nsf.gov/pubs/2000/ceose991/ceose991.html#TOP.

[COACHE], (2007). *COACHE Highlights Report*. Cambridge, MA: President and Fellows of Harvard University.

Daniell, E. (2006). *Every other Thursday: stories and strategies from successful women scientists*. New Haven [Conn.]: Yale University Press.

Eisen, B. (2009). Seeking Advice on Women in Science. *Inside Higher Ed, July*.

Etzkowitz, H., Kemelgor, C., Neuschatz, M., Uzzi, B., & Alonzo, J. (1994). The Paradox of Critical Mass for Women in Science. *Science, 266*, 51-54.

Etzkowitz, H., Kemelgor, C., & Uzzi, B. (2000). *Athena Unbound: The Advancement of Women in Science and Technology*. Cambridge, UK: Cambridge University Press.

Faulkner, W. (2001). The Technology Question in Feminism: A View From Feminist Technology Studies. *Women Studies International Forum, 24*(1), 79-95.

Fox Frank, M. (2001). Women, Science and Academia: Graduate Education and Careers. *Gender and Society, Vol 15*(No 5), 654-666.

Freehill, L., Brandi, C., Lain, A., & Frampton, A. (2009). Women in Engineering: A Review of the 2009 Literature. In Society of Women Engineers (Ed.), *A Compendium of the Society of Women Engineers Annual Literature Reviews on Women in Engineering*. Chicago: SWE Publishing.

Garvin-Doxas, K., & Barker, L. (2004). Communication in Computer Science Classrooms: Understanding Defensive Climates as a Means of Creating Supportive Behaviors. *ACM Journal of Educational Resources in Computing, 4*(1), 1-18.

Gibbons, M. (2009). Engineering By The Numbers. *American Society for Engineering Education, June,* 10-49.

Gornick, V. (2009). *Women in science: then and now* (25th anniversary ed.). New York: The Feminist Press at the City University of New York.

Hall, R., & Sandler, B. (1984). Out of the Classroom: A Chilly Campus Climate for Women? *Association of American Colleges, Project on the Status and Education of Women*,

Hamilton, K. (2005). Faculty Science Positions Continue to Elude Women of Color. *Black Issues in Higher Education, 21*(3), 36-39.

Handelsman, J., Cantor, N., Carnes, M., Denton, D., Fine, E., Grosz, B., et al. (2005). More Women in Science. *Science, 309*, 1190-1191.

Handelsman, J., Cantor, N., Carnes, M., Denton, D., Fine, E., Hinshaw, V., et al. (2005). More Women in Science. *Science, 309*(5738), 1190-1191.

Hanson, S. (2004). African American Women in Science: Experiences from High School through the Post-Secondary Years and Beyond. *National Women Studies Association, 16*(1), 96-115.

Hanson, S. L. (1996). *Lost Talent: Women in the Sciences*. Philadelphia: Temple University Press.

Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies, 14*(3), 575-599.

Harding, S. (1991). *Whose Science? Whose Knowledge? Thinking from Women's Lives*. Ithaca, NY: Cornell University Press.

Harding, S. (2006). *Science and Social Inequality: Feminist and Postcolonial Issues*. Urbana: University of Illinois Press.

Harding, S. G. (1993). *The "Racial" Economy of Science: Toward a Democratic Future*. Bloomington: Indiana University Press.

Harding, S. G. (1998). *Is Science Multicultural? Postcolonialisms, Feminisms, and Epistemologies*. Bloomington, Ind.: Indiana University Press.

Harding, S. G. (2008). *Sciences from below: Feminisms, Postcolonialities, and Modernities*. Durham: Duke University Press.

Harding, S. G., & O'Barr, J. F. (1987). *Sex and Scientific Inquiry*. Chicago: University of Chicago Press.

Henwood, F. (1996). WISE Choices? Understanding Occupational Decision-making in a Climate of Equal Opportunities for Women in Science and Technology. *Gender and Education, 8*(2), 199-214.

Herring, S., Ogan, C., Ahuja, M., & Robinson, J. (2006). Gender and the Culture of Computing in Applied IT Education. In E. Trauth (Ed.), *Encyclopedia of Gender and Information Technology* (pp. 474-481). Hershey: Information Science Publishing.

Huang, G., Taddese, N., Walter, E., & Peng, S. S. (2000). *Entry and Persistence of Women and Minorities in College Science and Engineering Education*. Washington D.C.: U.S. Department of Education. National Center for Education Statistics.

Jordan, D. (2006). *Sisters in Science: Conversations with Black Women Scientists on Race, Gneder and Their Passion for Science*. West Lafayette, ID: Purdue University Press.

Kelly, A. (1985). The Construction of Masculine Science. *British Journal of Sociology of Education, 6*(2), 133-154.

Klawe, M., & Leveson, N. (1995). Women in Computing: where are we now? *Communications of the ACM, 38*(1), 29-35.

Ladner, R. (2009). Broadening Participation: Opening Remarks. *Communications of the ACM, 52*(12), 22-24.

Leslie, L. L., McClure, G. T., & Oaxaca, R. L. (1998). Women and Minorities in Science and Engineering: A Life Sequence Analysis. *The Journal of Higher Education, 69*(3), 239-276.

Lie, M. (1995). Technology and Masculinity: The Case of the Computer. *The European Journal of Women Studies, 2*(3), 379-394.

Lie, M. (1997). Technology and Gender versus Technology and Work: Social Work and Computers. *ACTA Sociologica, 40*(2), 123-141.

Lohan, M. (2000). Constructive Tensions in Feminist Technology Studies. *Social Studies of Science, 30*(6), 895-916.

Loftus, M. (2007). Why Won't She Listen. *ASEE PRISM, 17*(3). Retrieved from http://www.prism-magazine.org/dec07/feature_generation-gap.cfm

Long, J. (2000). *From Scarcity to Visibility: Gender Differences in the Careers of Doctoral Scientists and Engineers*. Washington, D.C.: National Academy Press.

Malley, J. E., Rainwater, K., & Stewart, A. (2005). *Summary of Analyses of the Survey of the Climate for Women Scientists and Engineers in 2001 and 2005*. Ann Arbor: University of Michigan.

Margolis, J., Fisher, A., & Miller, F. (1999/2000). Caring About Connections: Gender and Computing. *IEEE Technology and Society Magazine, Winter*(13-20).

Margolis, J., & Fisher, A. (2002). *Unlocking the Clubhouse: Women in Computing*. Cambridge, MA: The MIT Press.

Mellstrom, U. (2009). The Intersection of Gender, Race and Cultural Boundaries or Why is Computer Science in Malaysia Dominated By Women? *Social Studies of Science, 39*(6), 885-907.

Moskal, B. (2002). Female Computer Science Doctorates: What Does the Survey of Earned Doctorates Reveal. *ACM SIGCSE Bulletin, 34*(2), 105-107.

Nelson, D. (2007). A National Analysis of Minorities in Science and Engineering Faculties at Research Universities. In C. N. Brammer & H. Rhoads (Eds.). http://cheminfo.chem.ou.edu/faculty/djn/diversity/Faculty_Tables_FY07/07Report.pdf.

Niemeier, D. A., & Gonzalez, C. (2004). Breaking in the Guildmasters' Club: What We Know About Women Science and Engineering Chairs at AAU Universities. *NSWA Journal, 16*(1), 157-171.

Phipps, A. (2008). *Women in science, engineering and technology : three decades of UK initiatives*. Stoke-on-Trent: Trentham Books.

Riley, D., Pawley, A., Tucker, J., & Catalano, G. (2009). Feminisms in Engineering Education: Transformative Possibilities. *NWSA Journal, 21*(2), 21-40.

Rosenbloom, J., Ash, R., Dupont, B., & Coder, L. (2009). Examining Obstacles to Broadening Participation in Computing: Evidence From a Survey of Professional Workers. *Comtemporary Economic Policy, 27*(3), 413-421.

Rosser, S. V. (2004). *The science glass ceiling: academic women scientists and the struggle to succeed*. New York: Routledge.

Rosser, S. V., & Zieseniss, M. (2000). Career issues and laboratory climates: different challenges and opportunities for women engineers and scientists (survey of fiscal year 1997 POWRE awardees). *Journal of Women and Minorities in Science and Engineering, 6*(2), 1-20.

Schiebinger, L. (1999). *Has Feminism Changed Science?* Cambridge: Harvard University Press.

Schiebinger, L. (2003). Introduction: Feminism in the Sciences. *Signs, 28*(3), 859-866.

Settles, I., Cortina, L., Malley, Janet, & Stewart, A. (2006). The Climate for Women in Academic Science: The Good, The Bad and The Changeable. *Psychology of Women Quarterly, Vol 30*, pp. 47-58.

Stewart, A., LaVaque-Manty, D., & Malley, J. (2004). Recruiting Female Faculty Members in Science and Engineering: Preliminary Evaluation of One Intervention Model. *Journal of Women and Minorities in Science and Engineering, 10*, 361-375.

Stewart, A., Malley, J., & LaVaque-Manty, D. (Eds.). (2007). *Transforming Science and Engineering: Advancing Academic Women*. Ann Arbor: University of Michigan Press.

Stolte-Heiskanen, V., First-Dilic, R. z., & European Coordination Centre for Research and Documentation in Social Sciences. (1991). *Women in science : token women or gender equality?* Oxford New York: Berg : Distributed exclusively in the U.S.A. and Canada by St. Martin's Press.

Tahmincioglu, E. (2010). Tech Industry Searching for Girls Gone Geek. *MSNBC, February 21st*. Retrieved from http://www.msnbc.msn.com/id/35460968/ns/business-

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careers/Valian, V. (1998). *Why So Slow? The Advancement of Women*. Cambridge, MA: The MIT Press.

Van Anders, S. M. (2004). Why the Academic Pipeline Leaks: Fewer Men Than Women Perceive Barriers to Becoming Professors. *Sex Roles, 51*(9/10), 511-521.

Waite, W., & Leonardi, P. (2004). Student Culture vs Group Work in Computer Science. *SIGCSE, March 3-7*, 12-16.

Wertheimer, L. (2007). Tenure at MIT Still Largely a Male Domain. *boston.com*, retrieved at: http://www.boston.com/news/education/higher/articles/2007/12/06/tenure_at_mit_still_largely_a_male_domain/

Wyer, M. (2001). *Women, science, and technology : a reader in feminist science studies*. New York: Routledge.

Wylie, A. Social Constructionist Arguments in Harding's Science and Social Inquality. *Hypatia, 23*(4), 201-211.

Wylie, A. The Feminism Question in Science: What Does It Mean to Do Social Science as a Feminist?" In S. N. Hesse-Biber (Ed.), *The Handbook of Feminist Research*. Thousand Oaks: Sage Publications.

Xie, Y., & Shauman, K. A. (2003a). *Women in science : career processes and outcomes*. Cambridge, Mass.: Harvard University Press.

Yee Zonis, C. (1977). Do Women in Science and Technology Need the Women's Movement? *Frontiers, II*(No. 3), 125-128.

Zuckerman, H., Cole, J. R., & Bruer, J. T. (Eds.). (1991). *The Outer Circle: Women in the Scientific Community*. New York: W.W. Norton and Company.

Zur, E., Barker, L., Irani, L., & Guzdial, M. (2005). *Contrasting Women's Experiences in Computer Science at Different Institutions.* Paper presented at the 36th SIGCSE Technical Symposium on Computer Science Education, St. Louis Missouri.

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