

Gender Diversity in STEM Executive Summary

Why does it matter?

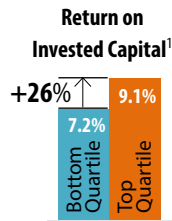
The business case is clear. Among other benefits, gender diversity can:

- Increase financial performance;
- Provide access to more talent;
- Strengthen innovation;
- Improve governance.



Gender diversity has a positive effect on **team innovation** in radical research²

Having a critical mass of 30% or at least 2 or 3 women on a board **decreases groupthink**⁶



Fortune 500 companies with the most and least women Board Directors; 2004-2008

Also: +16% Return on Sales¹

Women directors:

improve a firm's ability to navigate complex strategic issues³



positively influence board strategic direction & tasks^{4,5}



First Steps: Communication

What do you communicate about your company? How do you represent science, technology, engineering and math (STEM) careers? Do you:

- Use gender-inclusive language?
- Use photos that show both men and women in technical roles?
- Talk about your corporate values?
- Tell people that you value diversity?

Check: websites, reports, staff meetings and communications, shareholder meetings, etc. Are you communicating, explicitly and implicitly, that your company is a great place for both men and women in STEM?

First Steps:

People-Friendly Policies

It isn't about women-friendly policies - it is about people-friendly policies. Create a welcoming workplace that respects employees' lives outside the office:

- Offer flexible working arrangements;
- Encourage parental and adoptive leave for both men and women;
- Provide benefits that work for people in a wide range of situations;
- Provide professional development.

Check: do your policies match your practices? A policy that staff feel they cannot use is worse than no policy at all.

Be a Leader

Everyone has a role to play in increasing gender diversity in STEM. No matter what your position is, there are three simple things you can do to be a leader:

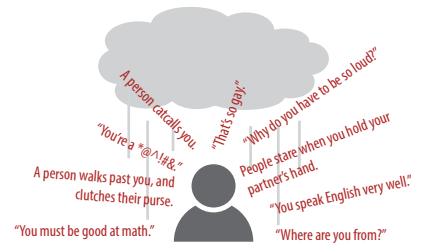
1. Be aware of your own biases. Take the Harvard implicit bias tests at www.implicit.harvard.edu.
2. Be aware of how you represent STEM and your organization, personally and at work.
3. Advocate for and implement people-friendly policies.

If you would like to learn more about gender diversity, visit wwest.mech.ubc.ca/diversity

On Microaggressions

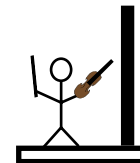
Sometimes unconscious, microaggressions are subtle, mundane exchanges that communicate hostile, derogatory, or negative messages to individuals based on group membership.^{11,12}

Microinsults, microinvalidations, and microassaults perpetuate stereotype threat^{7,8} and create a hostile work environment^{9,10}.



On Implicit Bias

Unconscious bias refers to the assumptions and conclusions we jump to without thinking.¹⁴ Everyone has unconscious biases. Being aware of these biases is the first step to combating them.



Women are **50%** more likely to advance in an orchestra audition if they **can't be seen**.¹³

On Stereotype Threat

Stereotype threat refers to the concern with being viewed through the lens of a stereotype.¹⁷ It is caused by cues in the situation that remind people of negative stereotypes.^{15,16}

Anxiety over confirming these stereotypes can impair an individual's ability to perform up to their full potential.¹⁸



References

For: Why Does it Matter?

1. Catalyst (2011). The bottom line: Corporate performance and women's representation on boards (2004–2008). Retrieved from: <http://www.catalyst.org/knowledge/bottom-line-corporate-performance-and-womens-representation-boards-20042008>
2. Diaz-Garcia, C., Gonzalez-Moreno, A., & Saez-Martinez, F.J. (2013). Gender diversity within R&D teams: Its impact on radicalness of innovation. *Innovation: Management, Policy, & Practice*, 15(2), 149-160.
3. Francoeur, C., Labelle, R., & Sinclair-Desgagné, B. (2008). Gender diversity in corporate governance and top management. *Journal of Business Ethics*, 81(1), 83-95.
4. Lückerkath-Rovers, M. (2013). Women on boards and firm performance. *Journal of Management & Governance*, 17(2), 491-509.
5. Nielsen, S., & Huse, M. (2010). The contribution of women on boards of directors: Going beyond the surface. *Corporate Governance: An International Review*, 18(2), 136-148.
6. Torchia, M., Calabrò, A., & Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. *Journal of Business Ethics*, 102(2), 299–317.

For: On Microaggressions

7. Cadinu, M., Maass, A., Rosabianca, A., & Kiesner, J. (2005). Why do women underperform under stereotype threat? Evidence for the role of negative thinking. *Psychological Science*, 16, 572 – 578.
8. Steele, C. M., Spencer, S. J., & Aronson, J. (2002). Contending with group image: The psychology of stereotype and social identity threat. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 379 – 440). New York: Academic Press.
9. Rowe, M. P. (1990). Barriers to equality: The power of subtle discrimination to maintain unequal opportunity. *Employee Responsibilities and Rights Journal*, 3, 153 – 163.
10. Solórzano, D., Ceja, M., & Yosso, T. (2000). Critical race theory, racial microaggressions, and campus racial climate: The experiences of African American college students. *The Journal of Negro Education*, 69(1/2), 60 – 73.
11. Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A. M. B., Nadal, K. L., & Esquilin, M. (2007). Racial microaggressions in everyday life: Implications for clinical practice. *American Psychologist*, 62, 271-286.
12. Sue, D.W. (2010). *Microaggressions in everyday life: Race, gender, and sexual orientation*. Hoboken, NJ: John Wiley & Sons.

For: On Implicit Bias

13. Goldin, C. & Rouse, C. (2000). Orchestrating impartiality: The impact of “blind” auditions on female musicians. *The American Economic Review*, 90(4), 715-741.
14. Network Exchange. (2012). Unconscious bias. Retrieved July 11, 2013, from <http://www.centralexchange.org/Repository/5/Document/NX%20Exchange%20Unconscious%20Bias%2009%2025%2012%2v4.pdf>

For: On Stereotype Threat

15. Bell, A. E., Spencer, S. J., Iserman, E., & Logel, C. R. (2003). Stereotype threat and women's performance in engineering. *Journal of Engineering Education*, 92(4), 307-312.
16. Nguyen, H.-H. D., & Ryan, A. M. (2008). Does stereotype threat affect test performance of minorities and women? A meta-analysis of experimental evidence. *Journal of Applied Psychology*, 93, 1314-1334.
17. Steele, C.M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African-Americans. *Journal of Personality and Social Psychology*, 69, 797-811.
18. Walton, G., & Spencer, S. (2009). Latent ability: Grades and test scores systematically underestimate the intellectual ability of negatively stereotyped students. *Psychological Science*, 20(9), 1132-1139

Recommended Readings

For more information on these topics, please consider reading the rest of this series at wwest.mech.ubc.ca/diversity.

About WVEST

Westcoast Women in Engineering, Science & Technology 2010-2015 (WVEST) was the operating name for the 2010-2015 NSERC Chair for Women in Science and Engineering (CWSE), BC and Yukon Region. Our mission is to advance engineering and science as welcoming careers that serve our world through holistic understanding and creative, appropriate and sustainable solutions. WVEST works locally and, in conjunction with the other CWSE Chairs, nationally on policy, research, advocacy, facilitation, and pilot programs that support women in science and engineering.

About the Chairholder

The 2010-2015 Chair was held by Dr. Elizabeth Croft, P.Eng., FEC, FASME. Dr. Croft is the Associate Dean, Education and Professional Development in the Faculty of Applied Science, and a Professor of Mechanical Engineering at the University of British Columbia. She is also the Director of the Collaborative Advanced Robotics and Intelligent Systems (CARIS) Laboratory. Her research investigates how robotic systems can behave, and be perceived to behave, in a safe, predictable, and helpful manner. She is the lead investigator of “Engendering Engineering Success,” a 3-year interdisciplinary research project that aims to take an evidence-based approach to increasing the retention of women in engineering by understanding and changing aspects of workplace culture that place women at a disadvantage.

Thank you to our sponsors

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