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What are the Top Factors that Prevent Women and Racial/Ethnic Minority Employees From Leaving Engineering Professions or the Tech Industry?

Abstract

The attrition of women and minorities from careers in technology and engineering professions is a phenomenon that has been well documented, in both popular and academic literature. This attrition compounds the underrepresentation of women and minorities in technology and engineering careers caused by differential attainment of science, technology, and engineering degrees among these groups. These factors highlight the importance of strategies that help to retain these groups within engineering and technology careers, thus helping to retain diverse talent in technology firms.

Keywords

engineering, engineers, HR, tech industry, technology industry, ethnic, minority, minorities, inclusion, diversity, women, females, female engineers, retention, benefits, HR, human resources

Comments

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Question

What are the top factors that prevent women and racial/ethnic minority employees from leaving engineering professions or the Tech Industry?

Introduction

The attrition of women and minorities from careers in technology and engineering professions is a phenomenon that has been well documented, in both popular and academic literature.¹ This attrition compounds the underrepresentation of women and minorities in technology and engineering careers caused by differential attainment of science, technology, and engineering degrees among these groups. These factors highlight the importance of strategies that help to retain these groups within engineering and technology careers, thus helping to retain diverse talent in technology firms.

Reasons Women Leave Technology and Engineering Careers

Much of the research on career paths for women in engineering and technology professions focuses on why women tend to leave these careers at higher rates than men, not explicitly on why women stay. Understanding why an estimated 52% of women eventually leave these careers can help firms implement strategies that can improve the working climate and promote the retention of women.² Factors that women in technical professions who have persisted in their careers cited as to why they stayed include “perceived organizational support, workplace barriers related to undermining behavior and incivility, support from co-workers and supervisors, career satisfaction, and commitment to the engineering profession.”³

Experiences of Workplace Bias: 30% of women in one survey reported workplace bias as a factor contributing to their departure from careers in technology and engineering.⁴ For example, women have reported that their ideas are undervalued or ignored within their organizations. Evidence of the cultural issues that affect women can also be found in unconscious expressions of bias such as micro-aggressions.

Solution: Firm level policies and practices that develop respectful and supportive working environments can help improve the retention of women. These can include training on identifying and addressing harmful workplace behaviors as well as providing employees meaningful mechanisms for reporting these issues in the workplace.

Challenges with Balancing Personal and Professional Life: One study from the National Science Foundation found 30% of women who left engineering careers did in order to spend more time with family.^{5,6} This highlights the need for policies that assist women in achieving adequate balance between their personal and professional lives.

Solution: Organizations can help employees achieve this balance by implementing policies related to flexible work arrangements and ensuring that employees are not perceived as being disadvantaged by utilizing these benefits.

Ineffective Supervisory Relationships: Women who were considering leaving engineering professions reported that they felt their supervisors did not communicate expectations clearly and that they at times felt overloaded within their roles.⁷

Solution: Supervisors should be provided the tools to better understand the needs of their employees. This includes providing women with the types of opportunities for new challenges and innovation that many report as central to remaining in engineering.

Isolation in the Workplace: Women have reported that feelings of exclusion can play a role in their decisions about whether to stay in technical roles, with one study finding that 33% of women in engineering and technology careers report feelings of isolation.⁸

Solution: Programs that facilitate links between women in these roles as well as programs that increase the workplace visibility of women can be helpful in this regard, this can include initiatives such as female mentorship/sponsorship programs.

Several studies have identified differences between women who leave technical careers and those who stay. Given these individual differences, firms may wish to explore ways of targeting specific traits in the women who they recruit into technical careers or helping women develop traits present in female employees who stayed in these engineering careers, as part of holistic efforts to improve retention in technical roles. Some of these traits can include self efficacy and self confidence. For example, a 2011 study from the University of Wisconsin found that “women who displayed higher levels of confidence in undertaking engineering tasks were less likely to express a desire to leave engineering.”⁹

Reports from both Stanford University and the National Center for Women & Information Technology highlight the importance of retaining women in technical professions at the mid-career level because of greater attrition at this stage in women’s careers.¹⁰ These reports highlight the importance of providing clear opportunities for leadership development and a clear path for advancement into leadership roles for women.

Firm Highlight: Firms such as Pinterest have implemented a range of initiatives including engineering promotion committees, designed to ensure that factors like race and gender do not impact the advancement of technical staff within the organization.¹¹

Retention of Racial and Ethnic Minorities in Technology and Engineering Careers

A majority of the literature on workplace retention in the engineering and technology sectors thus far has focused on the experiences of women as opposed to those of racial and ethnic minorities. Despite this limitation, the evidence reviewed suggests that many of the interventions aimed at improving organizational cultures for women in technology and engineering can have positive effects for minority retention. The research on minority retention shows that similar to women, minorities value the availability of opportunities for advancement, an important signal of this can be having diverse talent in high level positions.¹² Representation signals to employees that a firm values diversity and that there is opportunity for advancement for individuals in their group. In addition to this, members of minority groups place significant value on the availability of opportunities to update technical skills through programming in the workplace. Members of minority groups are also more likely to view the availability of mentorship programs as an important factor for remaining with an organization.

Conclusion

It is clear that firms in the technology and engineering sector face ongoing challenges with ensuring the diversity of their workforce. Policies that promote the retention and inclusion of diverse talent enable technology firms to reap the full benefits of workplace diversity including the cost savings from reduced organizational turnover. Some of these policies include developing supportive work environments, providing clear pathways for advancement and development, as well as a focus on ensuring high quality supervisory relationships.

Works Cited

1. St. Fleur, N. (2014). Many Women Leave Engineering, Blame The Work Culture. *National Public Radio*. Retrieved from www.npr.org/sections/alltechconsidered/2014/08/12/339638726/many-women-leave-engineering-blame-the-work-culture
 2. Hewlett, S.A., Sherbin, L., Dieudonné, F., Fagnoli, C., & Fredman, C. (2014). Athena factor 2.0: Accelerating female talent in science, engineering & technology. Retrieved from <http://www.talentinnovation.org/assets/Athena-2-ExecSummFINAL-CTI.pdf>
 - 3,4, 6, 7, 9. Fouad, N. A., & Singh, R. (2011). *Stemming the tide: Why women leave engineering*. Retrieved from <http://www.aeecenter.org/files/newsletters/CWEEL/Summer2011/StemmingtheTide.pdf>
 5. Fouad, N. A., & Singh, R. (2011). *Understanding women's persistence in engineering careers*. Paper presented at 2011 WEPAN National Conference Advancing Women: Transforming Engineering Education, Seattle, Washington. Retrieved from <http://ocs.sfu.ca/wepan/index.php/wepan2011/wepan2011/paper/view/248/69>
- Additional Sources
8. Ashcraft, C., & Blithe, S. (2010). *Women in IT: The facts*. National Center for Women and Technology. Retrieved from www.ncwit.org/sites/default/files/legacy/pdf/NCWIT_TheFacts_rev2010.pdf
 10. Simard, C., & Hendeson, D. (2013). *Climbing the technical ladder: Obstacles and solutions for mid-level women in technology*. Report from Stanford University. Retrieved from https://gedcouncil.org/sites/default/files/Climbing_the_Technical_Ladder.pdf
 11. Lien, T. (2015). Why are women leaving the tech industry in droves?. *The Los Angeles Times*. Retrieved from <http://www.latimes.com/business/la-fi-women-tech-20150222-story.html>
 12. Simard, C. (2009). *Obstacles and solutions for underrepresented minorities in technology*. Report from Anita Borg Institute for Women and Technology. Retrieved from <http://www.cssia.com/pdf/20000076-ObstaclesandSolutionsforUnderrepresentedMinoritiesinTechnology.pdf>

Additional Material

Ayre, Mary, Julie Mills, and Judith Gill. "Yes, I do belong': the women who stay in engineering." *Engineering Studies* 5, no. 3 (2013): 216-232.

Bilimoria, D., Lord, L., & Bickley, M. (2014). *Women in STEM careers: International perspectives on increasing workforce participation, advancement and leadership*. Available from www.e-elgar.com/shop/women-in-stem-careers?_website=uk_warehouse

Buse, K., Bilimoria, D., & Perelli, S. (2013). Why they stay: women persisting in US engineering careers. *Career Development International*, 18(2), 139-154.

Fouad, N., Fitzpatrick, M., & Liu, J. P. (2011). Persistence of women in engineering careers: A qualitative study of current and former female engineers. *Journal of Women and Minorities in Science and Engineering*, 17(1).

Foust-Cummings, H., Sabattini, L. & Carter, N. (2008). *Women in technology: Maximizing talent, minimizing barriers*. Catalyst. Retrieved from www.catalyst.org/system/files/Women_in_Technology_Maximizing_Talent_Minimizing_Barriers.pdf

Hewlett, S. A., Luce, C. B., Servon, L. J., Sherbin, L., Shiller, P., Sosnovich, E., & Sumberg, K. (2008). The Athena factor: Reversing the brain drain in science, engineering, and technology. Retrieved from <http://documents.library.nsf.gov/edocs/HD6060-.A84-2008-PDF-Athena-factor-Reversing-the-brain-drain-in-science,-engineering,-and-technology.pdf>