Quick Take: Women in Science, Technology, Engineering, and Mathematics (STEM)

Jun 14, 2019

Education

The Gender Gap in STEM Begins with Education

Few women in the United States are earning degrees in STEM, except in the life sciences.¹

| Percentage of Degrees Earned by Women in Postsecondary Institutions in the United States (2015-2016)² |
|---------------------------------------------------------------|-----------|-----------|-----------|
|                                                              | Bachelor's | Master's  | PhD       |
| Biological and biomedical sciences                          | 59.9%      | 57.3%     | 53.0%     |
| Mathematics and statistics                                 | 42.5%      | 41.7%     | 28.5%     |
| Physical sciences and science technologies                 | 38.8%      | 37.8%     | 32.2%     |
| Engineering and engineering technologies                   | 19.7%      | 25.2%     | 23.5%     |
| Computer and information sciences and support services    | 18.7%      | 30.8%     | 20.1%     |
| All STEM Fields                                             | 35.6%      | 32.6%     | 33.7%     |
In 2016, **Canadian women**[^4] made up approximately one-third (34%) of all recipients of STEM bachelor’s degrees.[^4]

**The Fields of Engineering and Technology Are Especially Male-Dominated**

**Canadian women** were less likely to pursue higher-paying STEM fields such as engineering or computer science in 2016.[^5]

<table>
<thead>
<tr>
<th>Percentage of Canadian Women Enrolled in Post-Secondary Institutions (2016-2017)[^6]</th>
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<tbody>
<tr>
<td><strong>Physical and life sciences and technologies</strong></td>
</tr>
<tr>
<td><strong>Mathematics and computer and information sciences</strong></td>
</tr>
<tr>
<td><strong>Architecture, engineering, and related technologies</strong></td>
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In the **European Union (EU-28)**[^28], women accounted for slightly over half (53.3%) of tertiary education graduates in the natural sciences and mathematics and statistics but were only slightly over a quarter (27.7%) of engineering, manufacturing, and construction tertiary education graduates in 2016.[^8]

**The gender gap is especially wide in information and communication technologies, where women were less than a fifth (18.8%) of tertiary education graduates.**[^9]

<table>
<thead>
<tr>
<th>Percentage of Women Tertiary Education Graduates in Information and Communication Technologies in Europe (2016)</th>
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<tbody>
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<td><strong>European Union (EU-28)</strong></td>
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[^7]: https://www.catalyst.org/research/women-in-the-workforce-canada/
Percentage of Women Tertiary Education Graduates in Information and Communication Technologies in Europe (2016)

<table>
<thead>
<tr>
<th>Country</th>
<th>%</th>
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<tbody>
<tr>
<td>France</td>
<td>16.5%</td>
</tr>
<tr>
<td>Germany</td>
<td>18.1%</td>
</tr>
<tr>
<td>Netherlands*</td>
<td>12.5%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>8.9%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>19.4%</td>
</tr>
</tbody>
</table>

*Data is for 2015

Women in India earned over half of undergraduate degrees in both Information Technology (51.9%) and Science (51.3%) but remained underrepresented in engineering and technology undergraduate degrees overall (31.7%) in 2017-18.¹⁰

Yet women in India are only 30% of the Information Technology workforce and only about 10% of computer science researchers.¹¹

In 2017, undergraduate women in Japan represented just 14.5% of engineering majors and 27.2% of physical science majors.¹²

Women of Color Earn the Smallest Share of STEM Degrees

The share of STEM degrees is even smaller for women of color in the United States. In 2015–2016, women of color earned a small percentage of bachelor’s degrees across all STEM fields:¹³

- Asian women: 5.0%
- Black women: 2.9%
- Latinas: 3.6%

Labor Force

Men Continue to Dominate the STEM Workforce in Many Countries

Averaged across regions, women accounted for less than a third (28.8%) of those employed in scientific research and development (R&D) across the world in 2015.\textsuperscript{14}

Central Asia (48.1%), Latin American and the Caribbean (45.4%), Central and Eastern Europe (39.5%), and the Arab States (39.8%) are the only regions in which women represented over a third of the R&D workforce.\textsuperscript{15}

Women in \textbf{Australia} made up only 27% of the STEM workforce across all sectors in 2016.\textsuperscript{16}

Women accounted for only \textbf{12.4\% of engineers in Australia’s} labor force in 2016.\textsuperscript{17}

As of August 2018, women in \textbf{Australia} made up less than a quarter (22.8%) of those employed in computer system design and related services.\textsuperscript{18}

Among \textbf{young Canadians} (aged 25 to 34) holding bachelor’s degrees in STEM fields, \textbf{men were almost twice as likely to work in science and technology jobs as women in 2016.}\textsuperscript{19}

Women made up under a quarter (22.3%) of computer and information systems professionals, and only one in seven (13%) of civil, mechanical, electrical, and chemical engineers in \textbf{Canada}.\textsuperscript{20}

Women in the \textbf{United States} made up less than one-quarter (24%) of those employed in STEM occupations in 2015.\textsuperscript{21}

A substantial gender gap in engineering and computer occupations contributes to women’s overall underrepresentation in STEM.\textsuperscript{22}

In 2017, women in the \textbf{United States} represented:\textsuperscript{23}

\begin{itemize}
  \item 25.5\% of computer and mathematical occupations.
  \item 16.2\% of architecture, engineering and related occupations.
\end{itemize}

\textbf{Fewer than two in ten science and engineering employees in the United States were women of color} in 2015.\textsuperscript{24}
Asian Women: 6.5%
Black women: 1.6%
Latinas: 1.8%

The Gender Gap in High Tech Is Especially Wide

Certain high-tech jobs have a much bigger gap. In 2017, women in the United States accounted for less than 20% of those employed in those positions, including:²⁵

Software developers, applications and systems software (18.7%).
Computer network architects (4.2%).
Aerospace engineers (8.9%).

In the EU-28, women were just 32.6% of those employed in high-tech manufacturing and knowledge-intensive high-tech services in 2017.²⁶

Unequal Treatment at Work Is a Leading Reason Women Leave STEM Careers²⁷

Work experiences impact women’s decisions to leave. Isolation, male-dominated work environments, bias and a lack of effective women role models are other factors pushing women to leave STEM jobs.²⁸

Once women enter the tech field, they are 45% more likely to leave than men.²⁹

Bright Spot: Women in Europe Are Closing the Gender Gap in Science and Engineering³⁰

In 2017, women made up more than a third (40.5%) of scientists and engineers in the EU-28, an increase of more than 28% since 2007.³¹

Japan Set Targets to Improve Share of Women Researchers in STEM³²

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³³As of 2016, these targets have not been met.³⁴
As of March 2017, only 15.7% of Japan's researchers in science and technology were women.35

Leadership

STEM Fields Have Fewer Women on Boards Than Other Industries36

When compared to other industries (including non-STEM), the information technology industry had the lowest representation of women. Just over a quarter (28.5%) of companies surveyed still had zero women on their boards in 2017 and only 18% had three or more women.37

Women with technology experience may have an advantage in the boardroom. In 2016, women on corporate boards <https://www.catalyst.org/research/women-on-corporate-boards/> (16%) were almost twice as likely as their male counterparts (9%) to have professional technology experience among 518 Forbes Global 2000 companies.38

The Pay Gap

Even in High-Paying STEM Jobs, Women Earn Less Than Men39

In 2015, Canadian women who graduated with bachelor’s degrees in STEM earned just 82.1% of the earnings of their male counterparts.40

Even after more than thirty years of equal pay legislation, women in the European Union who worked in professional, scientific and technical activities earned 73.4% of what men did in 2014.41

In the United States, women in computer, engineering, and science occupations were paid an estimated 80.3% of men’s annual median earnings in 2017.42

While earning less than their male counterparts, women still receive a high premium for working in STEM. Women in STEM jobs earn 35% more than women in non-STEM jobs and 40% more than men in non-STEM jobs.43

Additional Resources: Read More <https://www.catalyst.org/privacy-notice>

Next Steps

Anita Bourg Institute, “Resources for Organizations <https://anitab.org/resources/>.”

**Research**

Full List of Catalyst Quick Takes on STEM Topics.


**DEFINITION:** “STEM” refers to the fields of science, technology, engineering, and mathematics. There is no standard definition of a STEM occupation. For the purposes of this Quick Take, STEM incorporates professional and technical support occupations in the areas of life and physical sciences, computer science and mathematics, and engineering. Less agreement has been made on the inclusion of educators, healthcare professionals, and social scientists in STEM, therefore, these occupations are not covered here.


18. Australia Bureau of Statistics, “Table 6: Employed Persons by Industry Sub-Division of Main Job (ANZSIC) and Sex,” (September 20, 2018).


22. Liana Christin Landivar, Disparities in STEM Employment by Sex, Race, and Hispanic Origin: American Community Survey Reports


27. Nest, “83% of Women Leave Their STEM Careers: We’re Changing That” (LaTrobe University, 2018); Cary Funk and Kim Parker, Women and Men in STEM Often at Odds Over Workplace Equity (Pew Research Center, 2018); Meredith Holmes, “Why Women Leave Engineering: The SWE Gender Culture Study” (Kapor Center, 2017); Divy Thakkar, Nithya Sambasivan, Purva Yardi, Pratap Sudarshan and Kentaro Toyama, “The Unexpected Entry and Exodus of Women in Computing and HCI in India,” CHI 2018 Paper No. 352 (2018); Christian Young, Peter Finegold and Lesley Lenssen, Stay or Go? The Experience of Female Engineers in Early Career (Institution of Mechanical Engineers, July 2017).


35. Government of Japan, Gender Equality Bureau Cabinet Office, “Chapter 8: Education and Research Fields


39. Christianne Corbett and Catherine Hill, Solving the Equation: The Variables for Women’s Success in Engineering and Computing


41. European Commission, She Figures Handbook 2018


43. Ryan Noonan, Women in STEM: 2017 Update

**Topics:**  [Business Case](https://www.catalyst.org/topics/business-case/)

[STEM](https://www.catalyst.org/topics/ stem/)

[Top Resources](https://www.catalyst.org/tag/top-resources/)

**Related Content**

**Ask Catalyst Express: STEM** [https://www.catalyst.org/research/ask-catalyst-express-stem/](https://www.catalyst.org/research/ask-catalyst-express-stem/)

This resource guide provides information on how STEM (science, technology, engineering, and math) companies can recruit, promote, and retain women.

**Infographic: The Gender Divide in Tech-Intensive Industries**


Get the facts about the leaky pipeline of women in STEM industries and how to fix it.

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