2016

Women in STEM: myths and misconceptions

WHAT MATTERS TO WOMEN IN STEM NOW?

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Why are women in STEM jobs less likely to land in top leadership positions? What do they look for in future employers?

NEW RESEARCH FROM UNIVERSUM EXPOSES WHICH STATEMENTS ARE **RESEARCH BASED AND TRUE**, AND WHICH ARE **MISLEADING** STEREOTYPES ABOUT WOMEN'S CAREERS IN STEM.

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For those who read the news regularly, barely a week goes by without hearing about women's lack of representation in the STEM fields. Sizeable resources have been invested in righting the inequality – from federal research dollars and scholarships for young women to employer diversity training programs, and leadership development for women executives. Still, the problem remains entrenched.

To make matters worse, many myths about women in STEM persist, perhaps born out of conditions that are a decade old. Among the myths:

- **WOMEN ARE NOT PURSUING STUDIES IN STEM.**
  Not true, or at least not always true. Pipeline isn't the biggest problem. If you examine the gender breakdown of students entering the STEM fields as a whole, the ratios aren't as unbalanced as pundits might lead you to believe. In the United States, for example, data from the National Science Foundation shows an equal balance of men and women in the biosciences, the social sciences, and mathematics, and only a modest difference in the physical sciences.[1] Certain fields, however, remain much more unbalanced, such as engineering and computer science. A 2013

study, for example, found women make up just 11 percent of software developers.[2]

- **WOMEN DROP OUT OF WORK WHEN THEY HAVE CHILDREN.**
  Not true. New research from McKinsey shows the promotions gap appears much earlier, years before women have children.[3]

- **THE HURDLES WOMEN FACE IN STEM FIELDS CAN BE SUMMARIZED NEATLY IN A SOUND BITE.**
  Absolutely not true. The challenges or barriers women face vary greatly by industry and by region (e.g. women have greater representation at senior levels in tech, media and banking; there are far fewer in energy and in institutional asset management).

Complicating the picture: The subject is controversial and trips up even the well-meaning. Just last month,

[1] http://www.pbs.org/newshour/making-sense/truth-women-stem-careers/
[2] https://www.theguardian.com/technology/2016/feb/12/women-considered-better-coders-hide-gender-github
[3] https://womenintheworkplace.com/

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venture capitalist John Greathouse wrote in the *Wall Street Journal* op-ed section that women should hide their gender when seeking capital for new ventures: "But whatever the reason – and however unfair it may be – I would suggest that if you are a woman raising capital, you might consider not including photos of your team in your pitch deck. If you identify your team via their initials (men and women), you effectively strip out all preconceptions related to race, ethnicity and gender." For his ill-advised words, he earned a barrage of negative attention and outrage among women and men alike.

Regardless of the "why" inequality exists in the workplace, let's examine more closely what we know: As women progress in their careers, particularly in technical and industrial careers of STEM, their number begins to drop off.

At the leadership level, the percent of women drops as low as 15 percent in some fields.[4] This is true not only in STEM, but across all professional jobs. At each higher level of corporate hierarchy, women are fewer and fewer, says a 2016 research study on women in the workforce by McKinsey & Co. and LeanIn.org.[5] The phenomenon isn't due to attrition, say the study authors, as rates of attrition are roughly the same for women and men. Rather, women are less likely to be promoted, and so less likely to end up in leadership positions because their rise is slower and more difficult.

Why the greater headwinds for women? The study authors surmise that, among other things, women face inequality related to corporate accountability. They report, "Even though more than 70 percent of companies say they are committed

to diversity, less than a third of their workers see senior leaders held accountable for improving gender outcomes."[6] The study also says subtle biases over time add up to greater career "friction." For example, they feel they have less access to senior leadership and that they are consulted less at work. In other words, there isn't a single event that signals that the path to the top is too difficult, but rather a host of smaller slights, omissions, etc. that leads to that outcome.

Most interesting of all, the study concludes that women becoming mothers isn't the biggest cause of unequal results between men and women – an astounding finding. For so long the gap has been blamed on women's desire to step off the career track and raise children, or at least scale back their efforts. But the McKinsey study says otherwise. Unequal representation

4   https://hbr.org/2016/09/what-it-will-take-to-keep-women-
    from-leaving-stem
5   https://womenintheworkplace.com/
6   http://www.mckinsey.com/business-functions/organization/
    our-insights/women-in-the-workplace-2016

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at the top, says the McKinsey research, is because of dozens of subtle—even hidden—factors, all of which create greater resistance for women at work.

Given our access to university students, we wanted to investigate some of these findings and specifically look at women's attitudes and career goals at the beginning of their careers. How do women studying STEM subjects differ from their male colleagues in those fields? And how do they differ from women who pursue careers in business?

This report will explore these ideas, and more, as we uncover the attitudes of students approaching graduation. We will also look at how employers can use this information to develop more effective recruiting and retention strategies.

Each year, Universum surveys the professional expectations of one million career-seekers from 55+ countries, and publishes dozens of reports on the top issues affecting global talent and the companies that hire talent. In this report, part of our Talent Insight Series, we uncover what female university students look for in future employers – and how companies can translate these findings into actionable steps for HR, recruiting and top leadership. In this study, we have segmented our research into four cohorts: women in STEM, women in business, men in STEM, and men in business. (For a full description of the study methodology, **CLICK HERE**.)

Main findings

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Beware the broad brush strokes

Too often employers address "women's issues" as if they were a homogenous set of ideas — but our research shows women who study STEM subjects often have ideas and attitudes that are very different from women who want to work in business. In fact, women in STEM sometimes have more in common with *men* who pursue careers in

STEM than women who want to work in business fields.

What's more, attitudes vary country by country and region by region, sometimes to such a large degree that a single "average" doesn't tell an accurate story (see our example below). In this report we'll point to areas where this is particularly true.

This is not to say there are no "themes" — in fact, we will name a few in this report. It's only a reminder that "women in STEM" isn't a label that has particular value, unless you're sure the insight has wide applicability. **FIGURE 1**

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FIGURE 1

PRIORITIES VARY BY COUNTRY

Percent who say one of their top career goals is to be competitively or intellectually challenged.

Russia / **38%**

Switzerland / **46%**

South Korea / **12%**

Japan / **29%**

China / **19%**

Singapore / **20%**

Brazil / **22%**

Argentina / **18%**

Australia / **36%**

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Women seek out meaning at work

What is one area of stark difference between women in STEM versus others, according to our research? Women studying STEM are much more likely to want to be aligned with a cause. On average, 40 percent of women in STEM cite it as a key consideration, compared to 27 percent of women in business, and 29 percent of men in STEM. This point of difference is massive – among the biggest in our research study.

First and foremost, it's important not to misconstrue the data. Women are not saying they are looking for employers to fund particular social issues or causes, such as the CSR movement you see taking hold in many companies. Rather, women in STEM are *looking for meaning at work*. They are searching for benefits beyond the paycheck. Or as Mary Beth Gerhardt, a meteorologist for the US National Oceanic and Atmospheric Administration's Center for Weather and Climate Prediction, told the *Baltimore Sun* newspaper about her job predicting storms, "It's really a dream for me. It feels like I am coming in and there's a purpose for what I am doing."[7]

Another point of caution: The level of commitment to finding a greater good at work varies *significantly* by country. For example, just 24 percent cite it as a priority in Austria versus 51 percent in Chile, 56 percent in Canada, 58 percent in the UK, and 64 percent in the United States. **FIGURE 2** / **FIGURE 3**

[7]   http://www.baltimoresun.com/business/federal-workplace/
bs-md-federal-millenials-20151119-story.html

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FIGURE 2

FINDING MEANING AT WORK

PERCENT WHO SAY A TOP CAREER GOAL IS "TO BE DEDICATED TO A CAUSE OR SERVE A GREATER GOOD."

PERCENT WHO SAY A TOP EMPLOYER ATTRIBUTE IS "INSPIRING PURPOSE."
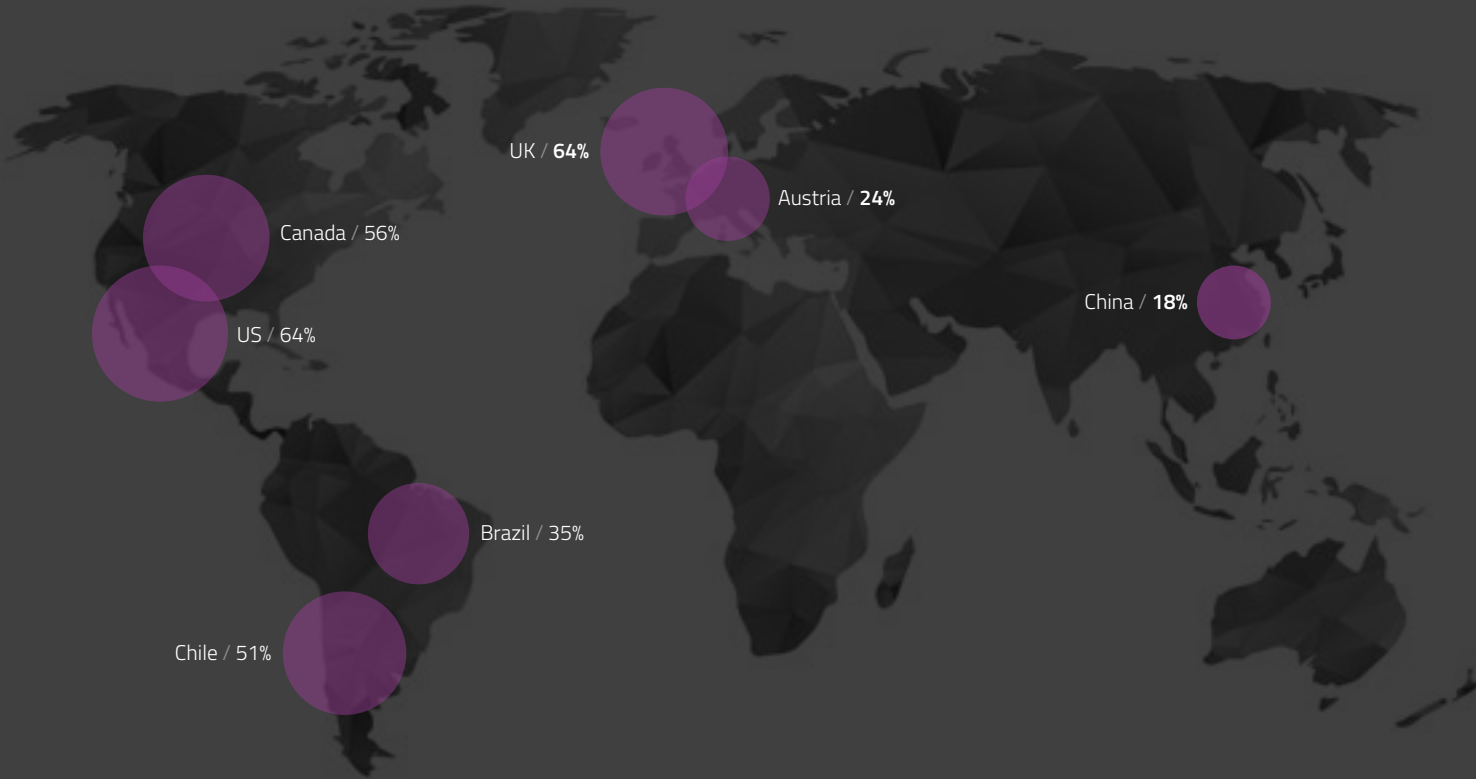
STEM STUDENTS

40%

29%

39%

33%

BUSINESS STUDENTS

27%

24%

31%

28%

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FIGURE 3

**MEANING AT WORK?
DEPENDS WHO YOU ASK**

Percent of women seeking careers in STEM who say a top career goal is to be dedicated to a cause or serve a greater good.

RETURN

UK / **64%**

Austria / **24%**

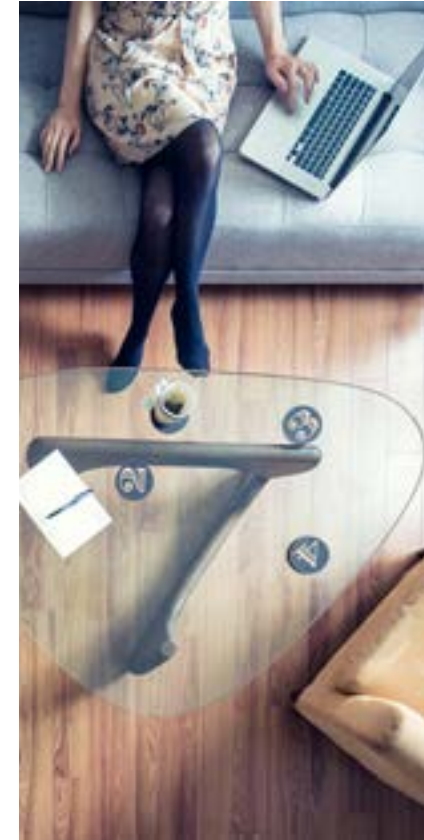Canada / 56%

China / **18%**

US / 64%

Brazil / 35%

Chile / 51%

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Women are institutions' ethical backbones

Too often, supporting women in STEM is positioned as "the right thing to do" – or a cause célèbre to hold up for the inevitable lists: *Best Places to Work or Best Employers for Women*. It's time to change the narrative. Employers need women to join their organizations – and in particular the STEM fields where women are under-represented – because women bring different attitudes about employer reputation and corporate ethics. Thirty-five percent of women in STEM cite ethics at work as a key aspect of employer reputation, while just 23 percent of men in STEM do. It's possible that driving up the number of women in the STEM field is also a way of driving up companies' commitment to ethics and integrity. **FIGURE 4**

Our findings are backed up by others. In a study of women in business school, researchers from the Wharton School and the Haas School of Business found: "The women displayed far more outrage over these morally questionable decisions – and also thought they made less business sense – than the men in this small but disturbing experiment conducted by Jessica Kennedy of Wharton and Laura Kray from the Haas School of Business."[8]

Interestingly enough, advances in fields like artificial intelligence, robotics, neuroscience, biotechnology, and nanotechnology require a stronger commitment to ethics than ever before, as we grapple with the policy implications of new technologies and new ethical frontiers.[9]
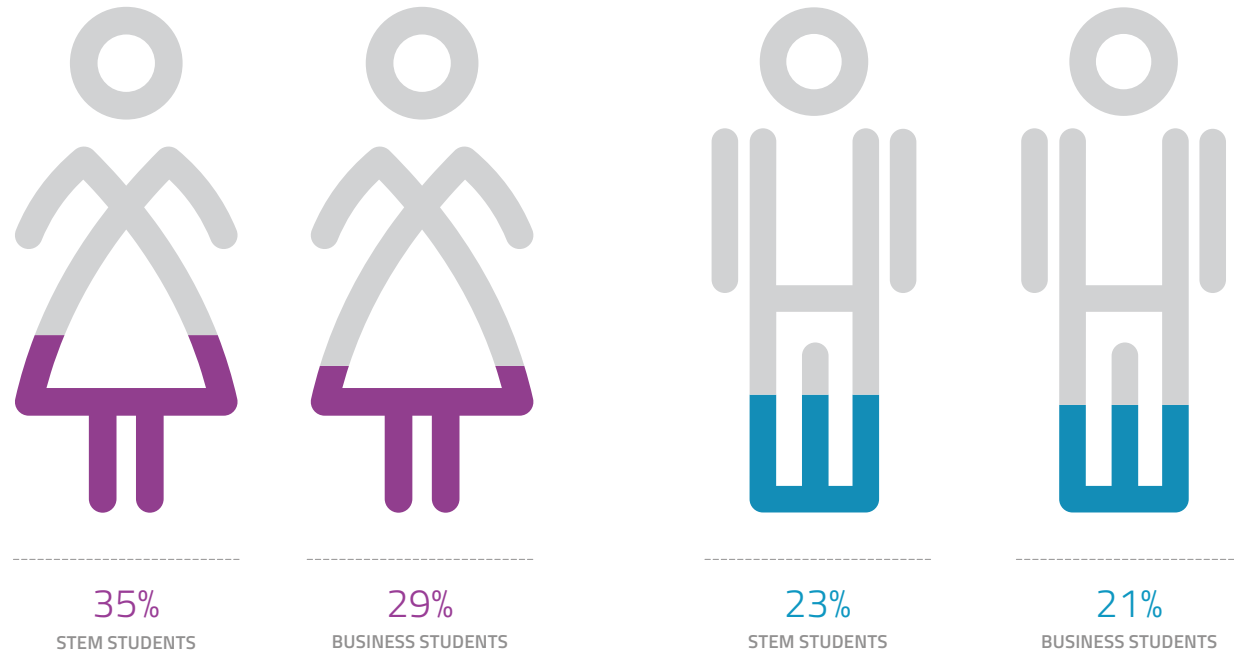
8   https://hbr.org/2013/09/women-in-the-workplace-a-research-roundup
9   https://www.ft.com/content/dd328bf4-a25e-11e5-8d70-42b68cfae6e4

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FIGURE 4

ETHICS AT WORK

Percent who say ethical standards
are a top priority when considering an
employer's reputation and image.

35%
STEM STUDENTS

29%
BUSINESS STUDENTS

23%
STEM STUDENTS

21%
BUSINESS STUDENTS

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Work/life balance is a top consideration ...

for both men and women

For too long work/life balance has been seen as a women's issue, but for students it's a top priority across the board. Both men and women choose "work/life balance" as a career goal more often than any other. That said, women cite it more often than men (e.g. 57 percent of women studying STEM cite it versus 49 percent of men studying STEM). While it's clear more women value it than men, the fact that half of men hoping to work in the STEM field choose work/life balance as a priority means employers should stop seeing it solely as a "women's issue."

What's more, the percentage of women seeking flexible work conditions – whether in STEM or business – is not significantly different from the percentage of men seeking the same.
FIGURE 5 / **FIGURE 6**

Why is it, then, that we blame women's absence from leadership roles on work/life balance problems, when men appear to have the same priorities?

What's particularly interesting about this question is that the large-scale McKinsey study released in September 2016 shows the diminishment of women's representation in managerial and leadership roles happens *before* most are having children. (Keep in mind the McKinsey study looked at women professionals in general, not just women in STEM fields.) McKinsey found the move from entry-level to management roles happens at around the five- to six-year mark, which is well before most women feel the pressures of balancing family and career. Or as McKinsey's Alexis Krivkovich explains in the report, "The fact that there's such a pronounced gap right at the outset suggests to us there's more going on here that companies need to address."[10]

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FIGURE 5

WORK/LIFE BALANCE

Percent who cite work/life balance as a top career goal.

STEM STUDENTS

BUSINESS STUDENTS

57%

49%

58%

47%
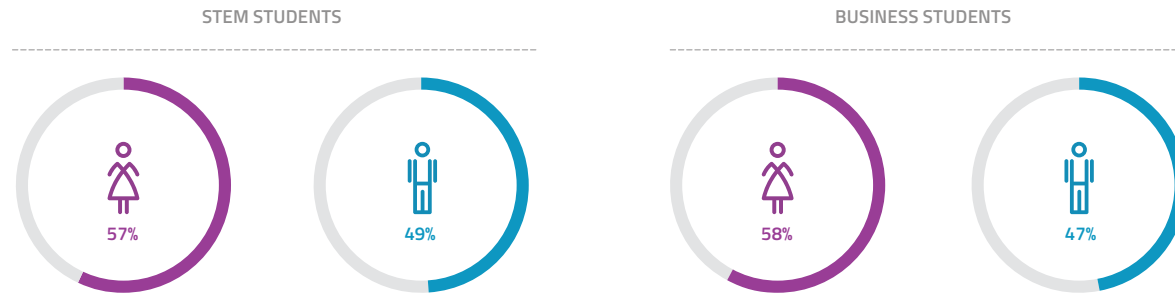
FIGURE 6

FLEXIBLE WORKING CONDITIONS

Percent who cite flexible working conditions as a top job consideration.
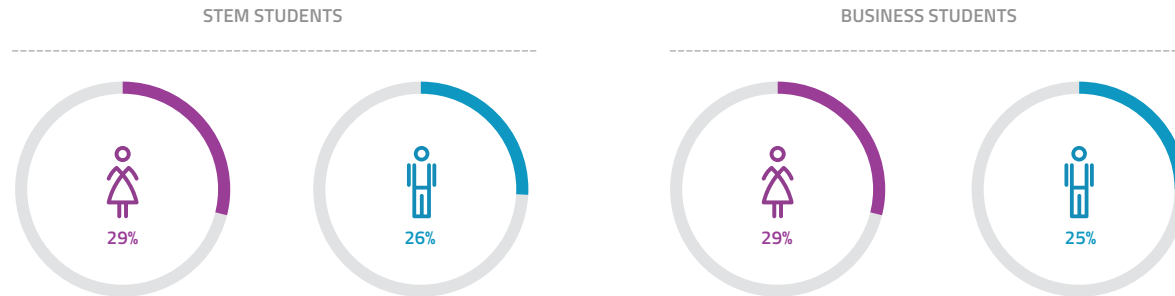
STEM STUDENTS

BUSINESS STUDENTS

29%

26%

29%

25%

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Responses by women in STEM about leadership priorities leave more questions than answers

One of the most challenging issues we face as a society is why so few women are represented in top leadership roles. In order to solve the problem, it's absolutely critical to understand root causes. Put another way, it's essential for organizations to know which factors they can influence. The McKinsey research shows women are simply less interested in becoming top executives; 40 percent of women are interested in becoming top executives versus 56 percent of men. And while women and men worry equally about work/life balance, women are more likely to say they don't want to endure the pressure cooker of top executive roles.

We wanted to investigate those findings by looking at the data Universum has compiled from students in the STEM fields.

AT THE BEGINNING OF THEIR CAREERS, AFTER THEY'VE ENJOYED LEADERSHIP ROLES IN UNIVERSITY BUT BEFORE A LONG TRACK RECORD INSIDE THEIR FIRST JOBS, WOMEN IN STEM ALREADY DON'T PRIORITIZE LEADERSHIP ROLES AS A KEY CAREER GOAL TO THE SAME DEGREE THAT MEN IN STEM DO.

First, our research shows women who pursue STEM careers are as likely as men to hold leadership roles in university. In fact, our research shows they are slightly *more likely* to have done so than men. What's more, women say that leadership opportunities inside their companies are a critical consideration when considering future employers; 35 percent of women in STEM say this, statistically on par with the response rate from men in STEM.

Yet women are significantly *less likely* to choose leadership as a career goal; 21 percent of women in STEM cite it as a career goal versus 30 percent of men in STEM. To reiterate: At the beginning of their careers, after they've enjoyed leadership roles in university but before a long track record inside their first jobs, women in STEM already don't prioritize leadership roles as a key career goal to the same degree that men in STEM do. It's a critical finding, and one that's aligned with the findings of the watershed study on women in the workforce by McKinsey & Co. and LeanIn.org. **FIGURE 7**

The question is: Do women not cite leadership as a career goal because it's not a personal ambition? Or is it because they foresee headwinds related to their gender and their calculations suggest leadership isn't worthwhile? Or is there some other factor at play? For example, "leadership" can have different meanings. One can "lead" a project, for example, without directly managing people. Plus, the requirements of leadership in university are different from those in the workplace. Are there specific aspects of leadership in the workplace that are less attractive to women? A study conducted by McKinsey in 2013 found that in interviews with 200 "successful women," 59 percent reported they didn't aspire to the C-suite.[11]

These are the question that *must be answered* if companies are going to make progress attracting and promoting women working in STEM fields.

[11] http://www.mckinsey.com/business-functions/organization/our-insights/unlocking-the-full-potential-of-women-at-work

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FIGURE 7

FEMALE VERSUS MALE STEM STUDENTS

WOMEN IN STEM ARE AS LIKELY AS MEN IN STEM TO HAVE HELD LEADERSHIP ROLES IN UNIVERSITY

"I HAVE BEEN A GROUP LEADER IN STUDENT EVENTS."

42%   40%

"I HAVE HAD A LEADING ROLE IN STUDENT ORGANIZATIONS."

36%   34%

AND LEADERSHIP OPPORTUNITIES ARE IMPORTANT TO WOMEN IN STEM

PERCENT WHO CHOOSE "LEADERSHIP OPPORTUNITIES" AS ONE OF THEIR TOP THREE REMUNERATION AND ADVANCEMENT GOALS.

35%   36%

YET WOMEN IN STEM ARE MUCH LESS LIKELY TO PRIORITIZE LEADERSHIP AS A CAREER GOAL

PERCENT WHO CHOOSE "TO BE A LEADER OR MANAGER OF PEOPLE" AS ONE OF THEIR TOP THREE CAREER GOALS.

21%   30%

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Recommendations

Isolate influence drivers

Employers' sphere of influence is limited, but employers can address immediate issues, particularly the troubling issue of women missing out on early promotion. To do so, they must:

- **Conduct research:** Fund internal research to identify hot spots. Where are the hurdles for women highest? Are fewer women applying for jobs than men? Do fewer get invited for an interview? Are they promotion at the same rate? Paid equitably compared to their male colleagues of similar experience and competence? Identify those areas where your organization can make the biggest impact. Interrogate your data. Also, look at differences by region and by role.

- **Develop an action plan:** Develop a short- and long-range plan to address those findings. Ensure each action has an accountable person tied to it, with a clear time frame to deliver results. Also, develop country-level approaches where needed. Avoid one-size-fits-all approaches that look good on paper but fail to deliver results.

Plan early interventions: First and foremost, address women's search for meaning. One of our biggest findings was the extent to which women in STEM are looking for something more than a paycheck. Find out how your company can address this need, both in how it recruits young talent, as well as how it inspires them to stay.

The McKinsey study shows women experience hurdles early on, not just when family issues press on them. Consider creating customized programs for high-potential women in STEM. These niche solutions may not work for the entire organization, but can support women who not only have intrinsic value to your organization for their expertise, but have potential to rise to management roles and have more influence inside your organization.

Pay close attention to turnover of women in the STEM fields. Multiple research studies say the rate of turnover among women in STEM fields is *not* due primarily to family pressures – including a 2013 study from Cornell University that found an inhospitable work environment was the biggest driver.[12] Examine closely what drives turnover of women in the STEM fields inside your organization and set up strategies to ameliorate it.

[12] https://campustechnology.com/articles/2013/11/22/high-career-turnover-rates-for-women-in-stem-fields-inhospitable-environment-a-factor.aspx

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Redefine the narrative: Think about the role (and value) of women not as a social good or cause célèbre, but as a mission-critical issue. Our study finds women care much more about corporate ethics — something borne out by other studies. This means supporting and promoting women is a way of supporting different ways of thinking and even supporting ethical decision-making.

The concept of "creative abrasion" was developed by Jerry Hirshberg, founder and president of Nissan Design International, and it has had a profound effect on technology companies, including Apple and WordPress. The idea is that organizations want some healthy amount of friction and conflict on teams to support innovation. Too little "abrasion" and insights aren't questioned and challenged. Too much abrasion and teams never make progress, as they offer up competing visions. The right amount of creative abrasion, however, ensures the ideas are tested and honed in a healthy way.

For teams in the STEM fields, supporting diversity, including gender diversity, is a critical form of creative abrasion. Women's ideas and outlook often differ from men's, and this divergence is healthy for organizations to advance and compete. This is particularly important as organizations grapple with fast-paced advances in fields that require clear, ethical thinking — fields such as artificial intelligence, robotics, neuroscience, and biotechnology.

Make people accountable: Behind every announcement to support women's initiatives, ensure there are measureable outcomes and accountability. Among the most troubling aspects of McKinsey's recent research study was the

finding that while companies say they are committed to gender diversity, and even take actions to support it, sometimes those actions are too superficial to make meaningful change. For example, it found 73 percent of companies recruit candidates from under-represented groups, but just 46 percent require a diverse slate of candidates for open positions – something that's harder to achieve. And 93 percent of companies say they "use clear and consistently applied criteria to evaluate performance," but employees report differently. Fifty-seven percent of employees say managers use consistent criteria in practice.

Invest in more employee training, but make it specific to your company and culture

Where are the most serious hurdles inside your organization? Are you not recruiting enough women to interview? Is the bigger problem early-career promotion of women? Or are women leaving your company in higher proportions than men? (Or some combination.) Ensure training matches on-the-ground problems your organization faces.

How employee training and development are designed and delivered are massively diverse. Solutions should be tailored to cohorts based on internal research. Younger employees often prefer on-demand solutions, for example. And mentoring – a strategy that lost favor for some time – is seeing a resurgence among women professionals, particularly in some STEM fields where women find the barriers to entry/promotion higher.

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WANT TO LEARN MORE?

GET IN TOUCH to understand how to make your organization more attractive to top business and STEM talent.

SIGN UP FOR A FREE 5-DAY TRIAL
and start your employer branding journey now!

METHODOLOGY

Universum conducts research in dozens of markets; this report covers responses from 55+ countries with statistically relevant sample sizes. Find the breakdown of countries and cohorts in the table below.

If you would like to learn more about talent attitudes within your market, please contact us.

Country	Female STEM students	Female Business students	Male STEM students	Male Business students
Algeria	401	153	337	108
Argentina	4141	2959	3624	1670
Australia	1308	1357	1350	718
Austria	2327	2243	2650	1392
Belgium	464	1302	990	1077
Brazil	14446	8438	17430	5746
Bulgaria	830	1024	1039	558
Canada	2852	4124	2206	2111
Chile	5879	2321	5994	2181
China	9928	10564	14925	5907
Colombia	7311	4467	8291	3288
Costa Rica	2092	1284	2222	761
Czech Republic	2553	2725	3152	1105
Denmark	1644	2165	2289	1722
Egypt	558	389	803	329
Finland	1355	2446	2032	1261
France	6182	12859	13988	8948
Germany	6124	8432	10872	6657
Ghana	116	241	595	418
Hong Kong	782	1289	764	645
Hungary	1123	1150	1821	716
India	5304	1990	12343	3323
Indonesia	4995	5051	5482	2735
Ireland	2533	1104	1989	825
Italy	4943	5203	5847	3796
Japan	763	1592	1793	1943
Kazakhstan	1200	1304	1348	678
Kenya	372	589	1468	890
Kuwait	117	127	109	87

Country	Female STEM students	Female Business students	Male STEM students	Male Business students
Lebanon	723	495	809	353
Malaysia	3717	4110	3263	1527
Mexico	4823	6592	8168	5061
Morocco	501	521	640	416
Netherlands	1724	3971	2123	2818
Nigeria	668	551	1979	746
Norway	2019	2508	2868	1439
Panama	548	534	416	236
Peru	3694	3142	4876	2147
Philippines	1102	1383	974	517
Poland	5584	3726	5146	1766
Qatar	92	65	93	36
Romania	1626	1192	3013	798
Russia	4947	5612	5538	2341
Saudi Arabia	452	193	3085	264
Singapore	2647	2232	3002	1346
South Africa	6443	8186	7458	5235
South Korea	1626	1165	4607	1668
Spain	5424	3565	5231	2116
Sweden	3433	3926	4966	2774
Switzerland	1113	3100	2118	2912
Thailand	1224	1367	1413	936
Total	146773	147028	199539	99047
Turkey	7513	5586	6636	3592
United Arab Emirates	1554	1368	1819	873
United Kingdom	10430	4205	6575	2518
United States	18093	12303	13093	8445
Vietnam	2138	8341	3846	3617

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