

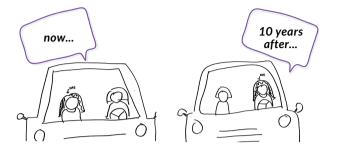
A Baseline Study



A collaboration project between



About the Cover



(English Translation) "Presently, I am at the part where I have a say, see the direction, have access to the information moving forward, and am in direct coordination with the people "driving" the organization. [In ten years], I can decide what to do next with everything, but of course it shouldn't only be me. I should be the next leader, and I vow to mentor the next generation."

Quote:

"[Presently], nandoon na ako sa part na may say ako, nakikita ko na [ang direction], may access na ako sa information moving forward, at may direct coordination na ako sa kung sinong 'nag-didrive' sa organization. [In ten years], I can decide what to do next with everything, pero siyempre dapat hindi lang ako 'yun. I should be the next leader, and I vow to mentor the next generation."

--- said Pat (not her actual name), managerial staff, on where she sees herself presently and in ten years' time.

"Hindi lang ako."

The quote above was one of the insights shared during one of the Focus Group Discussions with women employees in entry-level and managerial positions in STEM-related industries. When they were asked about where they want to be in ten years' time, many expressed the desire to "rise up the corporate ladder" and take on leadership roles. However, this did not mean that they wanted the success all to themselves. Part of the reasons they want to succeed is to help other women succeed as well, most especially the younger generation who want to work in the said industry.

"Hindi Lang Ako" is a catchy statement the team chose to represent all the sentiments, experiences, and insights shared by this study's respondents: women in STEM-related fields who are in entry-level to managerial level positions. In these interviews, surveys, and group discussions gathered within three months (March to May 2019), the team observed one prevalent theme for women: the desire to contribute to creating a more gender-inclusive society.

In revealing the experiences of women who are working in the STEM (Science, Technology, Engineering, Mathematics) industries during this day and age, it is imperative that we realize that the narratives in this study are *collective* rather than "rare" or "isolated". This implies that in creating change for a sector that has long been marginalized in the workplace -- if not only in the workplace -- the success of one woman or the advancement of a few women is not enough.

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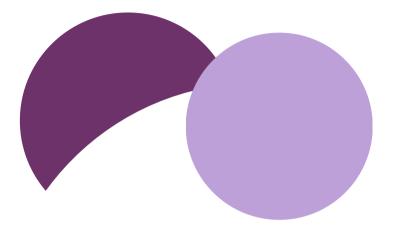
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EXECUTIVE SUMMARY

A Baseline Study

Proponents of the Study:

The Philippine Business Coalition for Women Empowerment (PBCWE), together with Unilab Foundation's STEM+PH, with the assistance of the UP Center for Women's Studies Foundation conducted a baseline study to examine the gender dimensions of the STEM economy, identify gaps, and make recommendations to STEM industries towards the direction of policies that might address such gaps. Both partners stand on the common ground of pursuing the advancement of women in STEM-related jobs.

PBCWE aims to pursue workplace gender equality (WGE) and women's economic empowerment (WEE). This coincides with STEM+PH's mission to promote an inclusive learning environment and nurture the next generation scientists and innovators dedicated to serve humanity. Together, PBCWE and STEM+PH combined their resources to push the STEM advocacy forward through this initiative.

Participants in the Study:

The study was conducted for three months, from March to May 2019 and utilized an online survey for its quantitative component and key informant interviews (KIIs) and focus group discussions (FGDs) for its qualitative part. The study located women in the entry, middle, and management levels in leading companies such as UNILAB, Sun Life, Pointwest, Emerson, and Stratpoint. An online survey was conducted with software companies such as E-Science Corporation and engineering companies such as Hitachi Global Storage Technologies, among others. For the interviews, women in leadership positions such as the CEO of Pointwest and an Undersecretary of the Department of Science and Technology (DOST) shared their professional experiences and insights on how to support women in the STEM industry. The scope of this research was limited to studying those in National Capital Region (NCR), where there is a concentration of STEM companies.

The Philippine Management Association of the Philippines (PMAP) also assisted in getting online respondents for this baseline study. PMAP, with its over 1,800 member companies and individual management executives, is a premier human resource (HR) development organization in the country. JobStreet, one of Asia's leading online employment marketplace platforms, also helped in gathering respondents. PMAP and JobStreet are possible networks to tap into for further research with larger scopes on this topic.

Review of Related Literature:

Many areas in the report highlighted where improvements can take place. With the Philippines ranking as the 8th most gender-equal in the world by the World Economic Forum's (WEF) Global Gender Report for 2018, there is hope for working women. Filipinas rank 106th in terms of labor participation, 21st for wage equality, and 28th for estimated earned income. From the 6th spot in 2006, the country slid to the 25th spot in 2018 in the Economic Participation and Opportunity sub-index.

Reports also showed that there are decreasing enrollments from women in STEM courses in the country. Globally, women leave their STEM-related jobs due to many negative experiences in the workplace. Although there is growth in the STEM workforce and the economic benefits of such are evident, women do not seem to be part of that growth.

Various national and international laws were cited in the study to point to legal initiatives to protect women in the workplace and to support them in their STEM-related careers. These include the UN Convention on the Elimination of all Forms of Discrimination Against Women 1979 (CEDAW) and various Republic Acts such as the Magna Carta of Women, Anti-Sexual Harassment (now called Safe Spaces Law), Expanded Maternity Leave, and Rooming-in and Breastfeeding Law. Despite these efforts, gender inequality is still experienced by women in the STEM workforce.

Models and Frameworks, and How They Were Used:

Two (2) main theoretical models in scientific literature were useful in identifying the barriers and facilitators to women in the STEM field. These are the Leaky Pipeline and the Vanishing Box models.

As cited in the first paragraph, two (2) main theoretical frameworks were used. First, the Leaky Pipeline model is a metaphor that likens the journey of women in their STEM carriers. This models attributes to the barriers of the women in STEM to advance in their careers as "leaks" in the pipeline. Some of these leaks include motherhood and family-related concerns, discrimination, sexual harassment and lack of role models, among others. Second, the Vanishing Box model accounts for where the women in STEM go after leaving their traditional STEM carriers, why they "vanish" and where they reappear. This model was developed to explain the emergence of new occupations for women where there is an intersection between science and economy.

Another useful model is the Rao and Kelleher's Framework to Gender Equality and Institutional Change. Rao and Kelleher postulate that to advance gender equality in the workplace, there has to be formal rules and policies that are implemented within an institution. This is opposed to the implicit rules and norms and ignores the huge impact that an institution can bring about. Facilitators to narrow gender inequality need to be formal and done through the organizational and not just individual efforts.

The Leaky Pipeline and Vanishing Box models give possible explanations to the existing problem of the dearth of women in the STEM fields. As such, these two (2) scientific models anticipated and informed the selection of respondents in this study, as well as gave context to the results. We find that the results of this study conform to some aspects predicted by these models.

Rao-Kelleher's model is not a prescriptive model but rather a descriptive one, outlining possible areas for alleviating the gender gap in women in STEM fields. These three (3) models work hand in hand to give us a lens to view the study as a whole, and were crucial in the conceptualization, implementation, and contextualization of the study.

Research Results and Findings:

A total of 134 respondents participated in the study, with 14 in top-level management positions participating in the Key Informant Interviews (KIIs), 48 in entry-level and managerial positions participating in the Focus Group Discussions (FGDs) and 72 employees participating in the online survey.

Most of the KII participants are 40 years old and above, with about 36% having masters or doctoral degree as their highest educational attainment. Majority of them have more than 10 years of service with their employers and the positions that they hold are mostly in middle management.

For the FGD, majority of the participants are between 25 to 39 years old, single and in entry-level and managerial positions. Most of them have less than five (5) years of job tenure, with their current employers and finished courses in Computer, Math, Engineering or Surveying.

For the online survey, respondents have an average age of 31.73 years old with 82% of them between 20-39 year old. Majority of the survey participants are single, graduated from public high schools and finished non-computer/non-IT courses in colleges mostly located in the National Capital Region. Of the respondents being married (31%), most of their husbands likewise worked in the STEM industry. Respondents with children accounted for 34.29% and those who reported having dependents outside of their children accounted for 46%. This could mean that the respondents are still supporting their parents and/or other members of their extended families. Most of them have less than six (6) years of job tenure with their current companies. Majority currently work in industries that are related to computer and mathematics and most are holding staff positions.

Most of the respondents to the online survey have reported that they chose a career in STEM either because it was a personal decision to pursue such career path or because the career prospects in STEM were good. Another reason for choosing a career in STEM, though not as compelling, is having parents, a teacher or a role model in school who inspired them. Likewise, considerations that are very important to respondents when choosing a career in STEM include job security and stability, competitive earnings and benefits, opportunities to learn and grow, to do meaningful work, and long term career prospects.

Enabling and Hindering Factors

According to the research participants, the enabling factors that promote gender equality in the STEM industries were identified as the presence of supportive parents, spouses, other family members, managers and co-workers. Additionally, it is their personal interest in STEM-related skills and their positive attitude toward meeting the challenges at work that keeps them engaged. Being in a company that promotes gender-sensitive policies and programs also enable women in STEM careers to remain in their fields. The media's positive portrayal of women in STEM has also been inspirational to many women in STEM.

On the other hand, the hindering factors to gender equality in STEM industries, include the male-centered culture and environment in the workplace. There is male dominance in leadership and management positions. Furthermore, women also experience difficulties in pursuing work-life balance that they aim to achieve.

Conclusions and Recommendations:

This baseline study confirms what other previous studies have found -- that there are still many male-centered norms and work practices in STEM industries. Though some companies have institutionalized gender-sensitive work arrangements and have provided opportunities for women to advance in their STEM careers, many other factors remain many that prevent women from taking advantage of those opportunities.

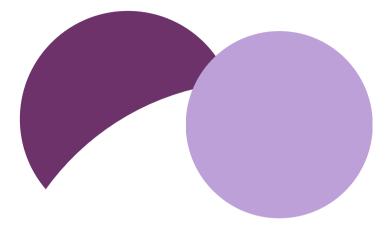
Although most of the respondents agree that they have positive experiences in the workplace, we have to take into account the spectrum of responses from all participants. We cannot disregard the fact that there are respondents who are at the opposite end of the spectrum -- who are "strongly disagreeing", "disagreeing", or "neutral" about the considerations that they rated. The considerations that most respondents rated to be "unsatisfactory" and "very unsatisfactory" include, "the praise they get for doing a good job", "the way their co-workers get along with each other", "the amount of pay and the amount of work they do", "the feeling of accomplishment from their job", "the chances of advancement in their job", "being able to do things that do not go against their conscience" and "the chance to do something that makes use of their abilities".

Furthermore, respondents who felt that "they were discriminated against" or "sexually harassed and did not report said incidents" are strong indications of the lack of institutionalized support for women in STEM. These negative responses merit further research since they will constantly erode whatever cumulative efforts were spent to promote gender equality in the workplace. We highlight the need for the aggrieved participants to surface and to seek safe avenues to address their concerns, rather than upholding the status quo by putting weight on the positive responses in the study.

Based on the Rao & Keheller's Framework, rules and policies have to be formalized and institutionalized in order to advance gender equality. Below are the recommendations to ensure that the practices to promote gender equality in the workplace will be continued and fully-sustained.

- Institutionalize gender sensitivity training across all levels of the organization -- from new hires all the way to the Board level, there has to be a continuing effort to inculcate and promote gender equality among all members of the organization.
- Review company policies and, if needed, recalibrate them to include programs and systems that will promote gender equality in the workplace. Government guidelines, especially those from the Commission on Women, should be included in the company policies. Government protocols on reporting discrimination and sexual harassment have to be openly published and discussed during employee orientations so that there is a heightened awareness on these issues.
- Launch and sustain corporate programs that will build the capacity of women to be ready for leadership roles.
- On the part of the academic institutions, there must be increased support and encouragement for women to pursue engineering and computer courses. Since life sciences are more popular among women, there has to be a strong push for them to get into these courses and fields of study.

Aside from institutional efforts, it is also recommended that various organizations and industries collaborate with one another to advocate and support the advancement of women in STEM. Various government agencies, for-profit and nonprofit organizations as well as academic institutions, should form partnerships to increase the participation of women in STEM industries.



Introduction

"Philippines is one of the 18 countries in Asia where females make up an equal or greater proportion of participants in STEM; some 52% of STEM researchers are female." (UNESCO as cited in Tagupa, 2017) In the 2018 Global Gender Report of the World Economic Forum (WEF), the Philippines ranked 8th as the most gender-equal country in the world, the only country from Asia in the top ten (10) list. While this ranking showed that the country has closed the gap in terms of educational attainment, Filipino women, however, ranked 106th in terms of labor force participation, 21st in wage equality for similar work, and 38th in terms of estimated earned income. These statistics placed the Philippines in the 25th spot of the Economic Participation and Opportunity sub-index, a nineteen (19) point drop from its no. 6 ranking in 2006.

"Other statistics also show that the gap may further widen due to decreasing science, technology, engineering and math (STEM) enrollments from women. For the academic year 2016-2017, the Commission on Higher Education reports that women comprise only 43% of STEM enrollments, lower than previous years and mostly in non-engineering or non-IT fields." (Sharma, 2018)

The same study reported that "The majority of the science and technology (S&T) professionals in the Philippines are concentrated in the National Capital Region (NCR), Region IV-A (CALABARZON), and Region III (Central Luzon). Meanwhile, those regions with the least number of S&T workers are the Autonomous Region in Muslim Mindanao (ARMM), Region IV-B (MIMAROPA), CARAGA, and Region XIII (SOCCSKSARGEN). Each of these regions has less than 2% of the country's science and technology professionals." (UNESCO as cited in Tagupa, 2017)

Globally, women comprised 12.2% of women on boards in the information technology industry in 2015 (*CSRI, 2016*). In a *Catalyst* study, "Women who start out in business roles in tech-intensive industries leave for other industries at high rates -- 53% of women, compared to 31% of men." (*Beninger, 2014*). Some of the factors that push women to make the decision to leave their science, engineering, and technology (SET) jobs are based on the following work experiences: isolation, hostile male-dominated work environments, ineffective executive feedback, and a lack of effective sponsors are factors pushing women to leave SET jobs. (*Hewlett, et al., 2008*).

Gender discrimination and sexual harassment are also experienced by women in STEM industries. Women who work in STEM in the United States (50 percent) are more likely to say that they have experienced discrimination in the workplace than those in non-STEM jobs (41 percent), as reported in the 2018 Pew Research Center survey. The industry also lacks female models for aspiring girls and young women who want to enter STEM. The Organization for Economic Cooperation and Development 2011 Report highlighted that one of the reasons why few girls pursue careers in the STEM industry is due to the lack of professional role models (*Cabico, 2018*).

These developments and statistics are the impetus for Unilab Foundation, through its STEM+PH program, to collaborate with the Philippine Business Coalition for Women Empowerment (PBCWE) to initiate this research project, and to locate women and describe their participation in the STEM industry.

INTRODUCTION (CONTINUED)

STEM+PH is a program of Unilab Foundation which aims to nurture the next generation of scientists and innovators dedicated to serving humanity. The program provides a platform where like-minded organizations can convene and collaborate to efficiently and effectively promote the advocacy STEM.

One of the goals of STEM+PH is to ensure that there are quality, high-paying STEM jobs in the future. The information culled from this project is aimed to identify the gaps in STEM workplaces in the Philippines, and provide a baseline that can be used by STEM+PH to develop initiatives to address these gaps

STEM+PH also recognizes that the success of a program or project largely depends on engaging stakeholders and encouraging their participation. In line with this goal, the research study has the PBCWE as one of its partners in accomplishing the goal of learning about experiences of women in STEM.

The PBCWE is a coalition of large and influential businesses established in 2017 to pursue Gender Equality (GE) and Women's Economic Empowerment (WEE) nationwide by initiating steps to improve gender equity in the workplace of its members and to influence other businesses to do the same.





The specific objectives of the study were as follows:

- Conduct a baseline study on the status of women working in the STEM industry, particularly locate women in the entry, middle, and management/leadership level.
- Identify the enabling and hindering factors in the advancement of women working in the STEM Industry using the Rao-Kelleher framework on Gender at Work framework, which looks at the following areas: women and men's consciousness, access to resources, internal culture and deep structure, formal rules & policies.
- Recommend initiatives to improve gender equality in the STEM industry.



Defining STEM

While it is generally understood that STEM stands for science, technology, engineering, and mathematics, there is no standard definition of STEM industries, especially regarding occupations, with varying levels of inclusions and exclusions, depending on the source. Definitions of STEM across literature fall on a spectrum of being either broadly encompassing or clear-cut and categorical. For example, the National Science Foundation, based in Virginia, USA, defines STEM fields as including the natural sciences, engineering, computer and information sciences, as well as the behavioral and social sciences (*Gonzalez & Kuenzi, 2012*).

The Pew Research Center (2018) defines the STEM workforce as 74 occupations including jobs related to computers and mathematics; architecture and engineering; life, physical and social science; healthcare practitioners and technicians; but excludes healthcare support occupations, such as nurse aids and medical assistants. On the other hand, the American Association of University Women (AAUW) includes the fields of physical, biological and agricultural sciences; computer and information sciences, engineering and engineering technologies, and mathematics, but does not include health, social, and behavioral sciences in their definition of STEM occupations (*Hill, Corbett, & St. Rose, 2010*).

STEM occupations can be further defined according to the highest level of education earned. For example, the US National Center for Science and Engineering Statistics requires a college degree or higher degrees to be considered as a STEM occupation; while at UNESCO, a STEM occupation is defined more narrowly as it considers more advanced degrees for inclusion (*Pew Research Center, 2018*). Most sources agree that secondary and post-secondary teachers are not included in the STEM workforce (*Pew Research Center, 2018; AAUW, 2010*).

OCCUPATIONS

SCIENCE

Physical scientists (chemists, physicists) Life scientists (biologists, medical doctors)

TECHNOLOGY

Computer Programmers Application/web developers Information Systems Manager Hardware/Software Developers Information Security Analysts, Database Administrators

ENGINEERING

Civil Industrial Chemical Agricultural Aerospace Electrical Architects Surveyors Drafters

MATHEMATICS

Actuaries Market Researchers Financial Planners Fraud Investigators Investment Analysts Data Analysts Statisticians Data Scientists Accountants

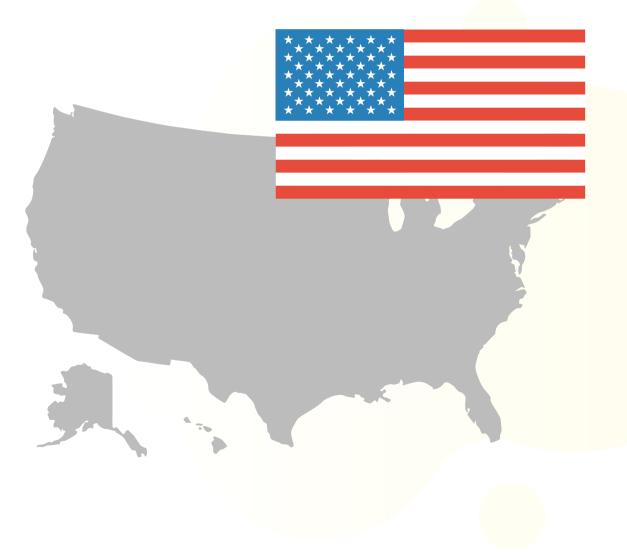
> STEM workers have the highest entry-level wages, and experience the most wage growth over their careers.

The Rise of the STEM Field in the United States

The rise of employment in STEM cannot be denied, growing from 9.7 million jobs in the United States in 1990 to 17.3 million in 2017 (*Pew Research Center, 2018*). This increase in STEM-related employment accounts for a staggering 79% growth, compared to 34% employment growth across all fields, with computer related jobs increasing by 38% (*Pew Research Center, 2017*).

In the United States, it is projected that STEM-related jobs will grow to 13% between 2017 and 2027, compared to 9% for all other jobs (Education Commission of the States, 2017).

The growth in STEM employment reflects commensurate improvement in wages and employment opportunities. Median earnings in the United States for STEM jobs are much higher at \$38.85 an hour, compared to overall median earnings for all other jobs at \$19.30 (Education Commission of the States, 2017). Across all levels of education, STEM workers earn around 26% more than their non- STEM counterparts (Pew Research Center, 2018). Additionally, STEM workers start out with the highest entry-level wages, as well as experience the most wage growth over their careers (Carnevale, Cheah, & Hanson, 2015). Unemployment rates for STEM workers holding STEM degrees also seem to be lower than their non-STEM counterparts, with an estimated rate of 5.5% compared to 2.2% in the United States (Education Commission of the States, 2017).



The Rise of the STEM Field in the Philippines

This global trend in the STEM workforce seems evident in the Philippines as well, with an estimated 362,000 STEM professionals in the Philippines in 1990 growing to 721,000 in 2010, indicating growth of around 50% in the last 20 years (*Department of Science and Technology – Science Education Institute, 2015*). This indicates that **STEM professionals** comprise 40% of the 1.8 million Filipino professionals, part of the overall 31 million working population.

Earnings of STEM professionals in the Philippines also reflect global economic trends in STEM industries. Monthly salaries reaching up to Php 69,957 for engineering (3rd highest) to Php 41,480 a month for data analysis and statistics (10th highest). This range is well above the median monthly basic pay of full-time workers for all industries, which was estimated to be at Php 12,013 (Philippine Statistics Authority, 2017).

The increase in the STEM workforce in the Philippines may have impacted the rise of the country in the Global Competitiveness Index, from 52nd place in 2013 to 47th out of 141 countries in 2015 (World Economic Forum, 2015). Additionally, the Philippines also improved its ranking by 17 spots to 83rd place among 141 countries in the Global Innovation Index in 2015 (Cornell University, INSEAD, & WIPO, 2015).

It is clear that the rise in STEM fields provides considerable economic benefits, not only for professionals, but for the national and global economy as well. The rising demand for STEM occupations precipitates the need for workers who are capable of sustaining and developing this growing field.



8 out of top 10

highest earning professions are in the STEM Field

Source: 2016 Occupational Wages Survey

Profession	Rank	Monthly Salary
Engineering	3 rd highest	Php 69,957
Data Analysis & Statistics	10 th highest	Php 41,480

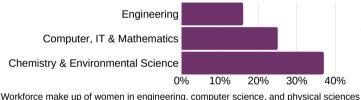
Women in STEM

The global rise of the STEM workforce and its subsequent economic benefits, however, does not seem to cascade to women in STEM careers. On average, **women account for only 40%** of the world's STEM workforce (*Holman, Stuart-Fox, & Hauser, 2018*).

Global Data

In Europe, women occupy 40.1% of STEM jobs. While their numbers have increased by more than 20% since 2007 (*Eurostat, 2017*), there are still disparities observed within the EU-28 countries, with only 15% to 20% of the STEM jobs occupied by women, with the widest disparities seen in the fields of engineering, manufacturing and construction.

In the United States, despite the tremendous growth in STEM employment, the gender gap is markedly wider, even dismal, with an overall share of only 24% of women working in STEM jobs, with varying levels of disparity across different fields, particularly in engineering, computer science, and the physical sciences (United States Department of Commerce, Economics, and Statistics Administration, 2017).



Source: US Department of Labor, 2019

On the other hand, there is no existing gender gap in the STEM workforce of biology and medical science fields, since women comprise more than half of the occupations in those areas.

In Australia, the gender gap in the STEM workforce seems wider, with just **41% of STEM-qualified jobs are occupied by women** (*Holman, et al., 2018*). Like the US and UK, the gender distribution in the STEM workforce varies considerably across the different fields. While the number of females with STEM qualifications increased by 23% between 2006 and 2011, this increase did not seem to impact gender distribution, as the ratio to male and female STEM jobs seemed to have been fairly stable over this time period: the gender gap held at 51% males to 49% females, with engineering as most uneven at 93% males to 7% females in STEM occupations (*Office of the Chief Scientist, 2016*).

World Economic Forum (2018) estimated that it will take another



IN THE PHILIPPINES

46% of women are in the STEM workforce

*Science Education Institute, Department of Science and Technology, 2015

Philippines ranked 8th with an above average 0.79 gender gap index of 0.79 The ONLY ASIAN COUNTRY in the top 10 world rankings in closing the gender gap.

Gender disparity among the STEM occupations in the Philippines is stable, showing a general narrowing of the gender gap among most professions. Likewise, it should be noted that the data from the Philippines also mirrors general global trends wherein greater gender disparity is observed in the fields of engineering and architecture.

The Philippines has also closed the gender gap completely in terms of educational achievement; meaning men and women have equal representation and access to education in the country. Global health and survival metrics rank the country at 42nd overall; and the Philippines' political empowerment at 13th out of 149 countries. However, despite the narrowing of the gender gap in the country, gender inequality is still a sobering and pressing issue.

before the gap between women and men close globally.

Laws & Policies on STEM and Gender Equality

The gender disparity between men and women in the STEM workforce necessitates a review of laws and policies about STEM as well as gender equality, both in the international and local contexts. Ideally, these structures seek to alleviate gender inequality, yet it still persists in glaring numbers across the globe.

GENDER INEQUALITY

It is defined as the difference between the way women and men are treated in society, or in between what women do and achieve, as reflected in social, political, cultural, and economic attainments or attitudes (*World Economic Forum, 2017*).

GENDER GAP

It is the application of gender inequality in specific contexts, such as social gaps and economic gaps, etc. The most common metric for gender gaps in the context of the workplace, must inevitably be measured in compensation, benefits, policies, and workplace environment and culture.

Thus, gender inequality is contextualized in this study as gender gaps in workplace elements, such as those previously mentioned.



PHILIPPINE LAWS TO FACILITATE GROWTH OF STEM FIELDS

- RA 2067: The Science Act, 1958
- RA 7687: The Scholarship Act of 1994
- RA 10612: The Fast-Tracked S&T Scholarship Act of 2013
- RA 8439: The Magna Carta for Scientists, Engineers, Researchers, and other S&T Personnel in the Government, 1997

In 2016, the United Nations produced a working paper on the STEM and Gender Advancement project (SAGA), to support policy-makers worldwide in setting up, implementing, monitoring, and evaluating gender equality in science and technology industries. This project contributes to several UN Sustainable Development Goals, namely, goals for quality education; gender equality; and industry, innovation and infrastructure.

The **Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW)** is an international treaty adopted by the United Nations in 1979 and ratified by 189 member-states, including the Philippines. Considered as an international bill of rights for women, this document lays out 30 core provisions that aim to define what constitutes discrimination and sets up an agenda for national action to end such discrimination (*Philippine Commission on Women, 2009*). In particular, **Article 11 asserts the right of women to free choice of profession and employment, the right to promotion, job security, and all benefits of condition and service**. This article also asserts the right of women "to equal remuneration, including benefits, and to equal treatment in respect of work of equal value, as well as equality of treatment in the evaluation of the quality of work." The Nairobi Forward-looking Strategies of 1985 and the 1995 Beijing Platform for Action were direct offshoots of the CEDAW and the commitment of the signatory states towards women empowerment and gender equality. The UN Millennium Declaration of 2000 outlines eight major goals, including promoting gender equality and empowerment of women. These goals have been reaffirmed by the United Nations outlining 17 Sustainable Development Goals for 2015 to 2030, continuing the goal of empowering women and promoting gender equality.

Laws and Policies on STEM and Gender Equality (Continued)

STRUCTURES TO SUPPORT ADVANCEMENT OF WOMEN & GENDER EQUALITY

INTERNATIONAL

- UN Convention on the Elimination of all Forms of Discrimination Against Women 1975 (CEDAW), 1979
- Nairobi Forward-Looking Strategies, 1985
- Beijing Platform for Action, 1995
- Millenium Declaration, 2000
- Sustainable Development Goals, 2015
- United Nations Educational, Scientific and Cultural Organization (UNESCO) STEM and Gender Advancement (SAGA), 2016

NATIONAL

- Philippine Commission on Women (PCW)
- International Labor Organization (ILO) and Technical Education and Skills Development Authority (TESDA) scholarships, training programs, 2018

SPECIFIC LAWS

- RA 9710: Magna Carta of Women
- RA 7877: Sexual Harassment Act, 1995
- RA 7322: Maternity Leave Act, 1992
- RA 6725: Discrimination Against
 Women Act, 1989
- RA 6972: Day Care Act, 2009
- RA 7600: Rooming-in and Breastfeeding Act, 1992; RA 10029: Expanded Breastfeeding Promotion Act, 2009

Despite these laws, policies, guidelines, and structures, gender inequality seems to still persist, especially in the STEM workforce. These measures may have helped narrow the gender gap over the years, but it is quite clear that more needs to be done. Turning to the scientific literature to examine the various explanations that attempt to explain the gender inequality in STEM may be helpful in determining the barriers and facilitators that affect under-representation of women, and may provide fertile starting points for further exploration into this issue.

Explaining the Under-Representation of Women in STEM

The continuing growth of the STEM industry does not seem to lead to a commensurate increase in the representation of women in these fields. In explaining this stable under-representation rate, two (2) main theoretical models have been proposed as problematized in scientific literature: the Leaky Pipeline model and the Vanishing Box model. These models help identify barriers and facilitators to women in the STEM field.

THE LEAKY PIPELINE

The 'leaky pipeline' is a long-standing metaphor that is used to seek explanations as to why women leave STEM careers at different stages in their life (*Berryman, 1983*). Imagine the trajectory of women in STEM as a pipeline, from secondary school to a professional career in STEM. Very few women reach the end of the pipeline and stay in their chosen STEM careers, due to a host of factors -- "leaks" in the pipeline, as it were. According to this model, **women are more likely than men to leave the STEM field** at different educational and developmental points in their academic and professional careers (*Pell, 1996; Wickware, 1997*).

In the Philippines, one study explored the predictors of the entry of women in STEM fields. Llenares and Deocaris (2014) studied how intrinsic and extrinsic factors play a role in the decision to enter the STEM workforce. They found that the type of secondary school (private or public) emerged as the strongest predictor of women's decision to enter the STEM workforce, with private education predicting entry into STEM. The second strongest predictor in this local study is that of collective and enduring beliefs, feelings, and behaviors towards socially-significant objects, groups, and events (*Llenares & Deocaris, 2014*), what they labeled in their analyses as attitudes. They assert that women "who are pragmatic in making decisions may likely pursue careers in STEM" (*Llenares & Deocaris, 2014, p. 429*). Additionally, interest in mathematical and scientific pursuits as evidenced in their choice of college courses seemed to be a predictor for entry into the STEM workforce (*Llenares & Deocaris, 2014*).

Different hindrances have been hypothesized to be "leaks" over decades of academic discourse on this explanatory model.

Covering the trajectory of women in STEM education (starting in secondary school) and subsequent career paths, various factors have been identified as occurring within this narrowing pipeline:

- cognitive abilities, discrimination (Ceci, Williams, & Barnett, 2009)
- motherhood and family-related constraints (Williams & Ceci, 2012; Hunt, 2016)
- pay and promotion opportunities (Hunt, 2016; Fouad, Chang, & Singh, 2017)
- lack of role models (Herrmann, et al., 2016)



Explaining the Under-Representation of Women in STEM (Continued)

THE VANISHING BOX MODEL

This model is composed of four phases:

BARRIERS TO THE ADVANCEMENT OF WOMEN IN SCIENCE

 Gendered Separation of Labor in Science: Men are usually tasked to handle building and structuring pursuits, while women are limited to handle more peoplecentered professions.

Sexual Harassment: Male- dominated environments, organizational tolerance for sexually harassing behavior, and hierarchical and dependent structure between mentors and trainees.

• Gender Socialization: Women leave careers in STEM because of conflicts in attitudes, motivation, selfconfidence due to maledominated cultures and environments in the STEM workplace.

DISAPPEARANCE OF WOMEN IN SCIENCE INTO A "RESERVE ARMY"

- Women with necessary skills in STEM end up as underutilized in their respective STEM professions.
- Women seek employment somewhere else, outside of STEM because they feel that their skills are not fully utilized in STEM industries due to prevailing male dominance.

EMERGENCE OF A NEW OCCCUPATION

- Crises events, new technologies, shifting cultural norms give rise to new STEM professions that women can participate in.
- Women etch out their own niche in emerging STEM industries facilitated by emerging technologies.

REAPPEARANCE OF WOMEN IN THESE NEW WORK CONDITIONS

- Flexible Working Practices: A working environment that can work around external life factors for women facilitate the participation of women in STEM.
- Good Work-Life
 Balance: Women need
 to be able to work hard
 rather than work long
 hours
- Lack of Ageism: Taking career breaks and rearing children should not be disadvantageous to women.
- Cultural Sensitivity: Employees must be enabled and trained to effectively interact sensitively with a wide range of people.
- Skills-based
 Hiring: There must be an emphasis on commercial skills and attributes rather than formal qualifications such as advanced degrees.

Developed as a more non-linear model to explain the under-representation of women in STEM, the Vanishing Box model seeks to address the limitations of the Leaky Pipeline model, specifically, in looking at recoupment of female talent rather than their loss in the STEM field (*Etzkowitz & Ranga, 2011*).

In the previous model, women vanish from the pipeline and are not considered again; this new model accounts for where they go after leaving the traditional STEM trajectories, why they vanish and where they reappear, so to speak. This new way of thinking was brought about by the emergence of new occupations in STEM that can be found at the intersections between science and economy, offering new alternative options for women leaving the traditional academic and industrial research landscape. According to Etzkowitz and Ranga (2011), "...such women scientists find new ways of utilizing their scientific, technical, and relational skills in new cross-border occupational areas that translate knowledge into other socio-economically valuable forms." (p. 133)

Explaining the Under-Representation of Women in STEM (Continued)

RAO AND KELLEHER'S FRAMEWORK

adjustments

· Women's issues firmly on the agenda

To understand how individual and organizational factors create working environments that empower women, and therefore potentially facilitate the increase and retention of women in the STEM workforce, Rao and Kelleher (2005) propose a framework that investigates several key areas of change. Rao and Kelleher postulate that to advance gender equality in the workplace, there has to be formal rules and policies that are implemented within an institution. This is opposed to the implicit rules and norms and ignores the huge impact that an institution can bring about. Facilitators to narrow gender inequality need to be formal and done through the organizational and not just individual efforts. They outline four areas along two axes: informal to formal and individual change to systemic change, as seen in the figure below.

INDIVIDUAL CHANGE WOMEN & MEN'S ACCESS TO RESOURCES **CONSCIOUSNESS** · Budget and other resources devoted Staff knowledge and commitment to to projects that advance equality gender equality · Number of women in leadership · Commitment of the leadership positions Capacity for dialogue and conflict · Freedom from fear of harassment or management violence **INFORMAL** FORMAL **INTERNAL CULTURE AND DEEP FORMAL RULES, POLICIES** STRUCTURE Mission includes gender equality Acceptance of women's leadership · Policies for anti-harassment, work- Organizational ownership of gender family arrangements, fair issues employment, etc. · Acceptance of needed work-family

 Accountability mechanisms that hold the organization accountable to women clients

SYSTEMIC CHANGE

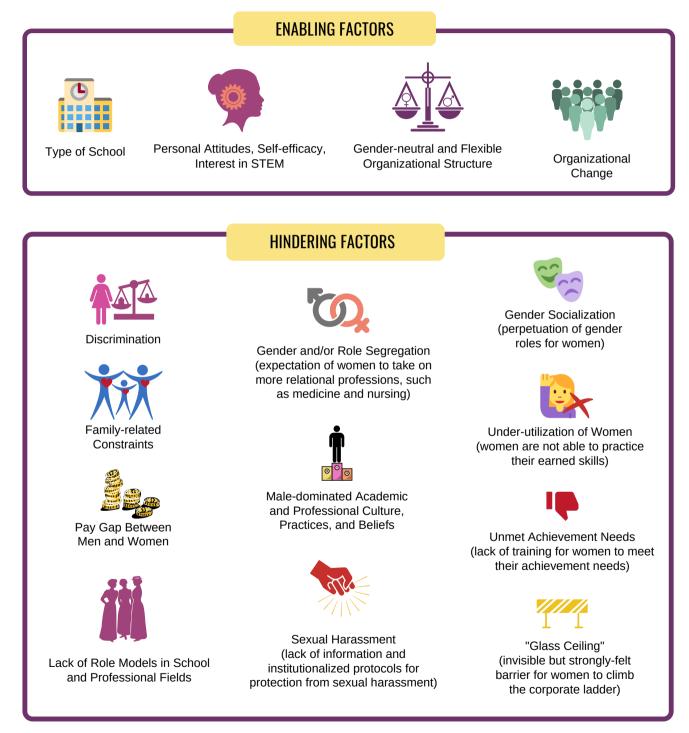
RAO AND KELLEHER'S FRAMEWORK TO GENDER EQUALITY AND INSTITUTIONAL CHANGE

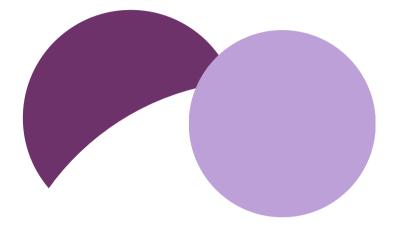
Rao and Kelleher (2005) posit that in order to have a significant impact on gender inequality, changes should be made in institutions, meaning the stated and implicit rules and norms in society that maintain the unequal position of women. They state that gender inequality exists because the bulk of efforts aimed to develop human rights to combat gender inequality ignores the role of institutions. This framework posits a holistic approach to narrowing inequality, and provides specific facilitators to explore, from the psychological to the organizational.

Explaining the Under-Representation of Women in STEM (Continued)

BARRIERS AND FACILITATORS TO THE ENTRY, CONTINUATION, AND RETENTION OF WOMEN IN STEM

A host of barriers and facilitators have been identified in the scientific literature, accounting for the under-representation of women in STEM fields. Following the Leaky Pipeline and the Vanishing Box models, these factors are brought about by personal, interpersonal, and organizational factors, as well as the dynamic interactions between these spheres. From this body of literature, the table below summarizes the barriers and facilitators to the entry, continuation, and retention of women in STEM.

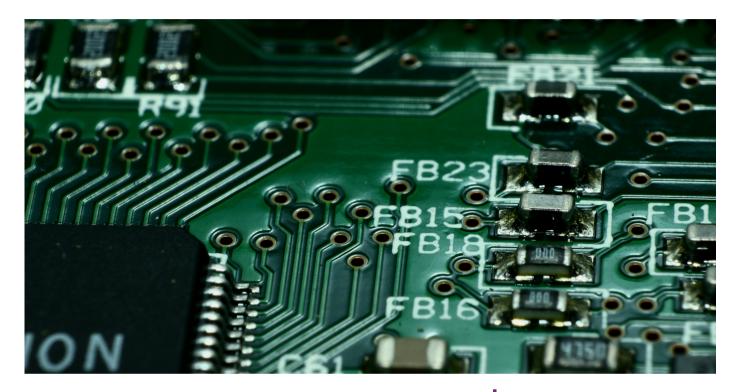




RESEARCH METHODOLOGY, DATA COLLECTION & LIMITATIONS

Research Methodology & Data Collection

To support the Philippine Business Coalition for Women Empowerment (PBCWE) in achieving its goal to improve gender equality in the workplace and promote inclusive economic growth, STEM+PH conducted a rapid baseline study on women in STEM careers. The study was conducted from March to May 2019 to examine the gender dimensions of the STEM economy, identify gaps and direct STEM industries towards the direction of policies that might address such gaps. The study utilized two (2) research methodologies: 1) Quantitative Survey conducted online and, 2) Qualitative Research using Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs).



To achieve these objectives, the study adopted the principles of feminist research to collect quantitative and qualitative information through the use of the following data collection techniques:

METHOD 1

Desk review of relevant literature and mapping of laws and policies on gender equality in the workplace and women's economic empowerment, particularly those related to STEM;

METHOD 3

Focus Group Discussions (FGDs)

METHOD 2

Key informant Interviews (KIIs) with select women leaders, experts, and stakeholders;

METHOD 4

Online Survey

Limitations

The study focused on women in STEM occupations in the National Capital Region (NCR), specifically in the following professions and companies:

- Computer and Math
 - Sun Life, Pointwest, Stratpoint
- Engineering and Surveying
 Emerson
- Physical and Life Sciences
 UNILAB

Research Methodology & Data Collection (Continued)

FOCUS GROUP DISCUSSION

The FGDs were participated in by employees in entry-level and managerial positions. They were chosen through a convenience sampling method, gathering of random sample of female employees within each partner company based on the availability of the participants. No requirement for age, race, economic class, or the like was identified as part of the selection criteria. The only determinant for the participants recruited for the FGDs was their identification as a woman.

To ensure that the FGDs conducted would yield an in-depth spectrum of viewpoints from all the participants, the conceptualized strategy was to limit the groups to five (5) to six (6) people. However, with the limited availability of their employees and the existing time constraints for them, some companies requested that their groups be merged into one big group of 11 or 12 members. Only one (1) company chose to send one (1) group of six (6) participants.

One (1) facilitator and one (1) documenter was assigned per FGD. The role of the facilitator was to preside over the discussion, to provide the rules and guidelines that participants were to follow to have a properly guided and insightful conversation. These basic guidelines involved showing respect for the other participants when they were sharing their own outputs, maintaining the right to privacy of their fellow participants, and actively participating to contribute to the knowledge the group would provide as a whole. The documenter was in charge of recording the conversation with the consent of the participants, to take down notes, and assist the facilitator in handing out the materials.

It is important to note that the set process initially planned for the FGDs was not strictly followed for each group. Variations were due to adjustments made for the personalities and characteristics of the participants, as well as time constraints. This produced more in-depth results rather than a simple replication of the process for each group, encouraging the participants to be able to dig deep into their insights about their experiences as women in their respective roles.

FGD ACTIVITIES AND PROCESSES

Introduction: Getting to Know

The introductory part of the FGD involved the introduction of each participant. They introduced themselves by stating their names, job title, roles and responsibilities, and background (e.g. undergraduate courses, masters, and/or prior roles held, including those in other companies). They provided information on how long they have been working with the company, and their personal history with them (eg. resigning from the company then coming back, how they entered the STEM industry through their respective companies, etc.)

First Part: Perception on the Current Status of Women in STEM and Where They Are Going

The first formal part of the FGD was for them to answer two questions: a) "How do they currently see themselves in the STEM industry?", and b) "Where do they see themselves in 10 years, in the future?" The main objective of this part was to explore the current state of women working in the industry, and where they wanted to go as of the time of asking. This involved an arts activity where they were asked to draw symbols that represented their answers. Afterwards, they were asked to present these and explain to the group. Other groups opted to utilize the model clay provided to more accurately depict their answers.

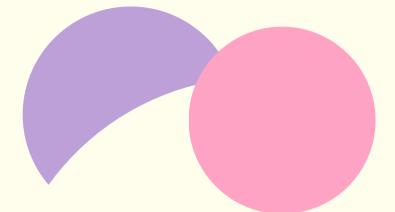
Second Part: Identifying Leaks in the Pipe

The second part focused on the identification of specific issues of women working in STEM industry that they observed. These could be actual experiences, experiences of their friends, what they have heard happened in the workplace, or issues that they generally know are happening in the industry as a whole. This activity was facilitated through providing metacards on which they identified one (1) issue each. These were then placed on a "leaky pipe" diagram drawn on a manila paper that was posted on the side of the rooms, symbolizing that these were "leaks" for women working in the industry - following the Leaky Pipe model.

Last Part: Moving Forward

The participants identified themselves as 'CEOs of the day'. This enabled them to pitch ideas on how the "leaks" or issues could be addressed. Answers provided were in the form of ideas for programs, seminars, trainings, and policy and structural changes. Their point of views on how to effectively encourage the younger generation of women to enter the STEM industry were also gathered in this portion.





PERCEPTIONS ON Gender Gap & Gender Inequality

Perceptions on Gender Gap and Gender Inequality

The responses of the survey participants on the KII, FGD, and Online Survey provide a wealth of information on the enabling and hindering factors that promote gender equality in the STEM industry. At the personal level, some of the research participants affirmed the need to promote a gender-fair working environment in STEM industries in order to encourage more women to enter and stay in these fields. A few, however, believe in a "gender-neutral" working environment. They do not find any need to give special attention to the various concerns of female employees in the context of their age, marital status and household responsibilities. Other than the positive attitude of most to promote gender equality in the STEM industries, the following enabling factors were identified by the research participants:

STATE OF WOMEN IN THE STEM INDUSTRY

Macho Culture

According to the participants, because men are usually more comfortable interacting with their fellow men, men in top-level management tend to give more attention and promotion to men in the lower levels. This does not help with the fact that management positions are dominated by men.

"I think yung culture na talaga is mas pinoprotektahan nila yung guys. Nale-left out ka, na para saan pa yung pag-stay ko? Hindi naman nila ako mabibigyan ng opportunities."

Increasing Participation and Empowerment for Women, but still experience difficulty in climbing the ladder and finding opportunities to grow

"Ngayon, slowly rising din naman ang women sa STEM. Pero talo pa rin ng mga lalaki, lalo na sa mga high positions. More on men pa rin. Pero meron na ring paisa-isa pa rin na babae, and that makes us happy and more fulfilled. Something to look up to lalo na yung, kayong mga bata, na you can rise up to whatever you have right now, kaya pa rin."

Women Perceived as Supporting Characters, but are Actually Major Contributors

One participant also points out that though the major decisionmakers at the top are mostly men, behind those decisions carried out are women. Women are the ones consulted and provide good insight for good decisions to be made. Though men are seen as the face of decisions made, resulting to the contributions of women here becoming invisible.

"Ang [problema lang] kasi dun, hindi yung babae yung nagsasalita dun, kaya hindi nakikita. The glory goes to the men. Kaya sinasabi nila na puro men."

HOW DO YOU SEE YOURSELF IN THE STEM INDUSTRY?

- Ambition & Anxiety in Figuring Things Out
 - "I feel like I can do more... I'm in my comfort zone right now, and I'm not being stretched by challenges."
 - "I still want to be in the STEM industry... but what if there's another opportunity for me to go into another industry? Di ko pa alam kung ano ang mas matimbang. Di ko alam kung ito ang best time lumipat."
- Empowered, Motivated, and Committed to STEM
 - A large majority of participants stated their strong commitment to continue in the STEM industry.

Financial Constraints

"Some women would like immediate na makatrabaho. But STEM courses, hindi gaano kaattractive at hindi mabilis kumuha. Kaya nauuwi sa sales ang women."

"Maybe they are interested, it's their passion... but they have to choose something na sustainable for their family, really secure for their needs, kaya they have to choose what's beneficial for the family."

Another possibility for why women go into other industries is because there are other opportunities with a better pay. An example provided by a participant from Stratpoint was setting up a business, where she would ideally be in more control of her time, and earn at the same time. Going back after not working for a while was not easy for women because they fall behind the fast pace of technology once they enter the workforce or when they pause for personal reasons, given the social expectations for women to be the 'family caretaker'.

Perceptions on Gender Gap and Gender Inequality (Continued)

ISSUES/CONCERNS OF WOMEN IN STEM

Workplace Harassment

"Nakita ko nga, sa ibang department, before sa school... may bias talaga towards women, tapos yung iba, if you can't deal with that, mag-ququit ka na lang. Everyday ka niloloko, or whatever, siyempre maiinis ka rin after a while, ayaw mo na. I'm sure it happens."

Gender Pay Gap

The gender pay gap was an identified external issue, not necessarily true for the companies involved in the study.

Science-related Work and Physical Requirements

"There's always a bias of what women can or cannot do. Let's say if manufacturing plant, why will I hire women, 'Anong gagawin nitong mga 'to sa loob? Di naman yan nagaayos ng mga makina.' If physical labor, no na agad yung mga babae, ganon? Dun palang, medyo unfair na. Mga babae, dapat nakaupo lang, dapat sulat-sulat lang, computer lang. A larger percentage of the work in STEM is geared towards yung parang kayang gawin ng mga males... or so people think. They always have this reason or exception, na only men can do this, women cannot. Yun palang, wala ka nang masyadong opportunity, like [participant] said, na konti na lang ang opening for you."

Hiring and Role Assignment Based on Gender Bias

There was an observation by one of the participants of the FGD that men stay on the technical side of things, while women are assigned to managerial positions limited to using 'soft skills'.

"Sa dati kong company... yung mga boys po talaga yung pinag-sisite po talaga, ta's kami lang yung nasa office. So yung ginagawa namin, is logical lang. Sila talaga yung manual."

Male Dominance (in numbers and leadership)

Because men are characteristically more comfortable interacting among themselves, men in management tend to promote and give more attention to men within the organization. This inclination (gender bias) perpetuates the domination of men in leadership roles and limits women from holding such positions.

ENABLING FACTORS

- Encouragement from family, friends, and people in the industry
 - Encouragement from the people around them led them to pursue a STEM course, and eventually a career. Available scholarships also enabled them to pursue a STEM course in college.
- Strong commitment to STEM
 - Women have a strong commitment to STEM.
 Even as women choose to leave their current position for a new one, this work opportunity would continue to be one in the STEM industry.
- Company support and best policy practices
 - An Emerson participant cited the culture of the US as a major factor to gender inclusion in the company: "[Inclusion] is a bit implied, kasi part siya ng culture ng US na wala silang --- as long as these are the requirements for the job, dun lang nila tinitignan. Hindi nila, kumbaga, since we're an American company, diba dun naman sa US kahit overage ka or babae ka, as long as you can do the job. I think it's really part of their culture na hindi titignan kung babae ka o lalaki. As long as you meet the minimum job requirement."
- Manipulation using perceived gender bias
 - Though not an apparent enabling factor, the ability of women to manipulate men through perceived gender bias was an approach some used to their advantage. One participant shared that she observed that a female colleague was able to command more respect and recognition from men she was meeting with at the time when she improved her physical appearance to be more appealing to them.

Availability of online jobs

- Most women who leave their jobs, find STEMrelated work opportunities online. Hence, stayat-home mothers are still able to put their STEM background into practice, while being able to take care of their families. There is one who is still able to be a business systems analyst online.
- High respect for women who survive STEM
 - There is high respect for women who are able to survive STEM courses, given their complexity and the domination of men in the industry.

CONSTRAINING FACTORS

· Gender stereotyping/bias

 "For women to move up in STEM, there is not much belief in women being decision-makers. Para bang lagi ka lang nanduon, so ikaw yung sport, or ikaw yung second or third in line, but you're not the [number] 1 decision-maker... since you're not a man. I think most organizations are like that, are still structured like that. Maybe related to [the idea that] women are mothers, so you're more nurturing? They look at you like you're a mom, you're not the one --- the boss. Not the one in charge."

· Seniority and fast pace of change in technology

- Because some participants were young, they felt certain limitations towards what they can contribute, as well as being heard by those who have been in the industry longer.
- "Some people want to resist change and defy digitalization. Everyone is limited, but they don't move anywhere."
- They experience a limitation when it comes to convincing those who have been in the industry for a long time to innovate more and evolve.
- Some of those who have been working longer in the industry demoralize those who have just entered, having high and unrealistic expectations of them. Because they were not given time to learn more during their delivery, they are rushed and immediately seen as incapable of doing the tasks.
- When one was asked if there was a gender difference in their adjustment to the pace of technology evolution, she said that at her level, the gap is not so apparent. However, according to her, pioneering technologies are made mostly by men, but project managers are mostly women. There are still fewer women employees in the organization.
- Because the industry is constantly evolving, there is a certain resistance to change. There is a lack of focus because the industry wants to accomplish many things, without actually determining what really needs to be done.

- External social expectations for women and balancing responsibilities
 - In their generation, one said that there was more pressure to build a family, and less on pursuing a STEM career.
 - "For women, mas mabigat yung responsibility. Marami akong handle before na di alam kung anong gagawin sa anak. Ang hirap i-handle ng mga ganon -they can't do their work, di talaga sila makapag-focus. And that affects the performance-based, pati buong team, yung output. Dumadami para sa iba yung ginagawa. Productivity is hindered."
 - "Sa amin, may notion na pag babae dapat may family, and hindi na sa career."
 - "Yung reason kung bakit yung babae, hindi ganon kasmooth-sailing yung ascend niya sa taas ng organization, kasi ang expectation ng society is siya yung magbibigay. Usually, pag na-promote ka to a higher position, relocation yan [to different sites], in most cases."
 - All this was more difficult given that STEM-related jobs were not necessarily limited to the usual 8am to 5pm working hours. Most of the time, they extended because of the workload the job requires.
 - Though this was not necessarily automatic, this was prevalent according to the group's observation.

"Parang napaka-unheard, lalo na sa mga Pilipina, na siya yung magmamanda ng family na, okay, magrerelocate tayo ah, kasi yung mommy niyo na-promote. Mostly ang obstacle, mas tayo nagbibigay in terms sa family, na parang tayo nag-aadjust, hindi tayo yung nag-seset ng standard."

CONSTRAINING FACTORS (CONTINUED)

Education System

- One described the system as too structured, focusing more on students meeting the cut-off rather than creating more graduates.
- Some participants have female batchmates who chose not to pursue a STEM career after graduating from a STEM course because they feel that they were unequipped. Once they graduate, the knowledge they have becomes dated, and companies are already dealing with new technology. Because of this, they enter different fields, for example, work in call centers or set up businesses, not knowing that training programs are available once they enter STEM companies.
- Students are not fully informed about the possible jobs or about the actual roles available to them in the industry after they graduate. Because they are unsure of what waits for them outside, they instinctively go for jobs that would earn them money immediately in other industries.
- Their male peers also appear to be a hindrance to women moving forward in STEM. In school, boys tend to think that they dominate girls and that women cannot succeed (in STEM) because "it's not a course for women". But in the end, women proved themselves and achieved more than men.

• Extra Step for Women and Self-Confidence

- People in the industry have expectations that pressure women to do more; even as what they have already accomplished is complex. One participant mentioned that there is a need for women to do things way beyond what is expected of them.
- One mentioned that she felt that she constantly needed to prove herself and establish credibility, especially when presenting to clients who are men in male-dominated fields. She felt that there was a constant need to prove that she understands the jargon and what they are doing, even when she is already in a high position. This also happens when she is mentoring a junior male colleague.
- One of the FGD participants shared that in her former job, her employer initially assigned her to be part of the administrative staff before having her proceed to the actual work of technology development. She told directly that she had to do undergo this stage first, to prove her potential. The men she worked with did not have the same experience.

There is a lack of opportunities available for women to go up the company ladder, as well as hold leadership positions within them.

> "Pag nagsalita kasi isang lalaki, parang mas may leadership sila, mas nakikinig sa kanila."

- Company Structure Flexibility, Availability of Opportunities, and Office Politics
 - Some FGD participants identified the lack of flexibility in the company structure as a constraining factor for them. Because of the limited number of positions, they are hindered from exploring other roles that they feel would contribute to their professional development.
 - Availability of positions to move up to was identified as a leak in one of the participating companies in FGD.

"Yung nag-reresign because of the work environment, nag-reresign, nagpapalipat, or something. Kasi ang hirap nun everyday, na you want to work amicably, pero ang dami mo pa ring [problema]... marami akong naging kakilala, talagang they leave kahit na managers na sila. Pag nagkaconflict sila sa mga boss... di nila natitiis. They will leave kahit na sabihin mong STEM pa rin."

"Ang dami-dami namin, papano mo nga yan i-mamanage lahat, eh some will be cruel to the point na [aalis]... anywhere I go, ang laki talaga nito. Ang laki niya, ang laking butas."

Perceptions on Gender Gap and Gender Inequality (Continued)

CONSTRAINING FACTORS (CONTINUED)

• Lack of Understanding of the Experience of Menstruation

 Even when it comes to dysmenorrhea, there is a lack of understanding among men. She wants them to understand that she can still go to work and do the tasks, but she just needs downtime -- which is something she feels that they can't comprehend.

"May natanggal dahil sa excess leaves dahil sa period. May knowledge about accessibility testing, so magandang i-retain. 1-2 days a month yung mga leave niya -- consistent, predictable. Contractual siya."

• Non-child Friendly Working Environment

- She said that in the past, she heard a policy about prohibiting employees from bringing their children.
- When employees brought their children with them to work, guards warn them that they are prohibited to do this, but do not necessarily prevent them from entering the office. The warning is given by the guard in accordance to policies they are tasked to enforce.

• Issues with Maternity Leaves

"Nag-naname kami ng i-poplot na i-aassign [sa isang project]. Nagiging consideration [yung pagbubuntis niya], so nawawalan ng opportunity. Mawawala siya eh. Malaking factor talaga. Pero may output-based policy pa rin, pero may shift sa priority kasi. Ma-dedelay yung project eh, marami akong issues na ma-eencounter. It's also an issue kasi obstacle to work."

Workplace Harassment

"Nakita ko nga, sa ibang department, before sa school... may bias talaga towards women, tapos yung iba, if you can't deal with that, mag-ququit ka na lang. Everyday ka niloloko, or whatever, siyempre maiinis ka rin after a while, ayaw mo na. I'm sure it happens."

FLAGSHIP PROJECTS NEEDED IN THE INDUSTRY

- Play Areas/Daycare Centers
 - Mothers have a difficult time leaving their children at home with other people or with people they do not know. Daycare Centers within the work environment/offices, would enable mothers to bring their children to work and increase their productivity. They would be more focused at work, instead of having to check on them every time while they are at the office.
- Availability of Breastfeeding Rooms and Time
 - While there are rooms provided for breastfeeding mothers as a matter of policy by a particular company, there were gaps in its implementation.

The rules specified that employees who were breastfeeding must use the room for only 45 minutes, with assigned lactation schedules, within the work day. This was ineffective because there were women who used the room longer than their assigned schedules; some for leisure (e.g., watching shows), or for rest/naps. This prevented other women from using the room when it was their turn. More importantly, lactation was not something mothers could simply control at a given time and within a particular time frame.

To address the situation, a proposal was made with the following provisions:

- a.) That more rooms be allocated for this need specifically, and be made more relaxing so women could lactate faster and with more ease.
- b.) That supervisors be informed of the assigned lactation schedules of the breastfeeding employees, to avoid scheduling a meeting during those times, and still give credit to the employees for the one-hour spent at the breastfeeding room.
- c.) That breastfeeding employees have lesser working hours.

FLAGSHIP PROJECTS NEEDED IN THE INDUSTRY (CONTINUED)

- Work-from-home Benefits for Women/Flexible Working Hours
 - This benefit could provide continuity for both the organization and the employed mothers who tend to stop work when they have children. Likewise, mothers end up stopping work altogether, never going back, because by the time that they are ready, technology has changed and their knowledge becomes dated.
 - It was also suggested that this benefit be extended during occasions when children have exams so mothers could stay home and tutor their children when needed.

"Pero may catch. You have to have [certain requirements]. Yung office situation mo or office set up, dapat ganon din yung set up mo sa bahay (desk, internet, fire extinguisher)."

"I think it's also based dun sa performance mo, parang you have to have a good performance rate for you to avail/apply for that."

Emerson's Work-From-Home Policy

- 1. The current policy of Emerson on work-from-home is eight (8) hours, with permit for one or two days dependent on the employees' location. This is available every week, and employees are informed of this policy.
- 2. To be qualified for work-from-home, you must be employed at Emerson for at least two years, with a performance rating of 3 or better, to ensure that output will still be submitted.
- 3. Employees apply for work-from-home through submitting pictures of their home set up. Spot audits are also conducted. If you are seen to not be in your set up during the spot audit, the work-from-home benefit will be retrieved.

Change Management

• To change cultures and mindsets about technology and being open to adapting better to its fast pace.

• Diversity Management

- Change management includes diversity management, which means fostering inclusion when it comes to employee assessment and providing equal opportunities for everyone, regardless of gender.
- This involves implementing clear-cut rules for inclusion in projects and increasing the participation of women here, increasing the employment of persons with disabilities, being inclusive of members of the LGBT community, informing everyone of sexual harassment policies, and punishing sexist behavior, including microaggression.
- Emerson's diversity and inclusion program was commended by their participants. These are regular programs of the company for their employees, disseminated through group messages, written announcements, and email blasts, where women are included in maledominated roles within the company.
- Back Up/Work Instructions
 - Currently, this is already being implemented in Emerson.

"So, as a CEO, kailangan lahat may back up... gusto ko, bawat isa sa amin alam ang trabaho ng bawat isa. Pag may nawala, hindi mahihinto yung trabaho nun. Kailangan laging may back up, saka may naka-prepare lagi na work instructions."

FLAGSHIP PROJECTS NEEDED IN THE INDUSTRY (CONTINUED)

- Mentorship and Sponsorship
 - Senior employees would be paired up with junior ones to help with their personal and professional development.

"Kung seryoso talaga yung company to have, to increase women leaders, they could (probabaly as a CEO) you could coach someone, mapa-babae, mapa-lalaki.
Kunwari, yung boss ko lalaki, tapos i-gogroom ka niya to be a leader. So parang sponsorship na regardless of, if at some point you choose family or pag nag-maternity leave ka, na pagbalik mo pa rin, may sponsorship pa rin si leader mo na i-ggroom ka pa rin niya."

"Sociocultural 'to eh. As a leader of a company, hindi mo ma-sosolve yung kultura ng isang bansa. Pwede kang mag-provide ng policy."

Change in the Assessment Process

- Performance-based promotion
- Flexibility for teams to create their own processes and standards in their projects, which can be enhanced and communicated to the whole team. This is not limited to testing, but also involves performance, evaluation, because many are involved in handling this.

"[Promotion should be] based on time and not on output. Na-lelead ko yung team, nag-step up ako -- dapat may merit na yun."

- Training and Seminars
 - Continuous training for everyone so they could keep up with the developments in technology
 - To boost the confidence of women regardless of their race. Trainings were also conducted to solicit ideas from what the group wanted to learn and provide, all related to women empowerment.

Coverage of Pregnancy

• Pregnancy and its related complications are not covered by the insurance provided by companies.

When the online survey respondents were asked to rate their agreement, disagreement or neutrality about several areas in their STEM careers, the following are what they have shared:

Job Satisfaction

When respondents were asked to rate the level of satisfaction they have with 20 various considerations in the workplace, they are satisfied in general. The considerations for job satisfaction that most respondents rated to be satisfactory and very satisfactory include the chance to do things for people, the chance to try their own methods of doing the job, the way their job provides for steady employment, the chance to tell people what to do, the chance to be somebody in the community and the working conditions. On the other hand, the considerations that most respondents rated to be unsatisfactory and very unsatisfactory include the praise they get for doing a good job, the way their coworkers get along with each other, the amount of pay and the amount of work they do, the feeling of accomplishment from their job, the chances of advancement in their job, being able to do things that do not go against their conscience and the chance to do something that makes use of their abilities.

STEM Opportunities

 Majority of the respondents reported that they are aware of personal development opportunities at the workplace. Majority also reported internal trainings as the main source of their personal development.

Environment

 Majority of the respondents feel value. That they are happy to be identified by their own gender in their company. They also think the same for women in other companies. However, they neither agree nor disagree that their work environment is better suited to a particular gender.

Perceptions on Gender Gap and Gender Inequality (Continued)

Equality in Compensation and Advancement

• The highest rated work environment factor for compensation and advancement is that of equal consideration for promotion among men and women in their company. Those who agree and strongly agree that this is the work environment they find themselves in is 75% of the respondents. Additionally, 72% think that women are equally compensated for the same level of work and effort as male counterparts. 66% believe that there are enough women in leadership roles and 77% think that companies take adequate steps to ensure that men and women are given the same professional opportunities.

Responding to Women's Needs

• Majority of the respondents think that work conditions in their companies are responsive to the needs of women as well as to those who are currently raising children.





Sexual Harassment and Discrimination

 It is alarming to note that 11.11% of the online survey respondents have experienced sexual harassment in the workplace and did not report it to any one in their company. Those who have experienced sexual discrimination in the workplace accounted for 8% and did not report it as well.

Turnover

 Three (3) main reasons are cited why women in STEM think that women leave their company and their industry. These are family-related reasons, better compensation and advancement opportunities in other companies and sexual discrimination and harassment.

Perceptions on Gender Gap and Gender Inequality (Continued)

SYNTHESIS

A trend in some of the discussions is that women are assigned to managerial positions because they are seen to be more organized than men. This may be seen as both a positive and negative occurrence: this would be positive because in the context of this company, women would be in higher positions; but it could also be negative for those who wish to work in technical jobs. Though women are perceived to be more organized as mentioned, they could also be seen as less capable to think in complexities as compared to men.

In some jobs, the physical requirement and perception that women could not handle this could affect the performance assessment of women, making them appear as less productive as men because of this misconception.

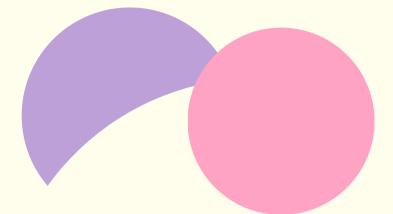
With women taking up a minority of leadership positions, this translates to the lack of policies designed to protect women. Even when these policies exist, their enforcement and the information dissemination about these become lacking. It was observed that where women are on the top of the company ladder, policies are more known among participants, as well as their processes.

There is a perception among the participants of a certain company, that the said company prefer leaders who are men rather than women because women are seen as more emotional. For them, male leaders were more objective and macro managed more, while female leaders were more of micro managers, wanting to know every detail of what you are doing, *"Parang kasi mas emotionally attached yung girl than guys."* They also saw women as less objective than men. One of them shared that she had a female leader who was unattached, which she did not like. She preferred a boss who was "strong," which she defined as firm and direct.

STEM is seen as an unstable and unpredictable career for some women. Information dissemination about the actual opportunities and developments in the industry is necessary not only for students, but their families as well. Perhaps more opportunities to get to know the industry better must be presented to the younger generation.

Most women in the discussions saw that being strong and not easily irritated by jokes of men was a key to surviving in the industry. "Although dito naman kasi, feeling ko is di naman din talaga maarte yung mga babae rito, na parang konting joke lang ng mga lalaki, i-rereport na. Maganda yung culture, how we people bond with each other, medyo okay siya sa company." While this may not have been identified as a constraining factor by the participant, it could be said that this behavior may result in the perpetuation of jokes that could affect other women, and exclude or discriminate them without them realizing it. It may be identified as internalized misogyny.

Women in middle and top management positions reported that promotions and climbing up the career ladder is based on merit ("Basically, STEM is merit-based... The qualifications, the technical skills, the know-how. I think it wouldn't be any different. If you have the skills, you will be able to show it.")



STEM CAREER ENABLING & HINDERING FACTORS

STEM Career Enabling & Hindering Factors

The responses of KII, FGD and online survey participants provide a wealth of information about the enabling well as hindering factors to promote gender equality in the STEM industries. At the personal level, some of the research participants affirmed the need to promote a gender-fair working environment in the STEM industries in order to encourage more women to enter and stay in these fields. A few however, believe in a "gender-neutral" working environment. They do not find any need to give special attention to the various concerns of female employees in the context of their age, marital status and household responsibilities. Other than the positive attitude of most to promote gender equality in the STEM industries, the following enabling factors were identified by the research participants:

Supportive Parents and Other Family Members

Some account for their "success" and readiness to work in a male-dominated industry to their family upbringing and supportive family members. They were exposed early in life to parents and other relatives who were engaged in STEM activities. The early exposure of the study participants to STEM-related knowledge and skills have given them the confidence to negotiate through the challenges of a male-centered working environment. Another traced her career in STEM to a very young age, in grade school and high school. She already showed a propensity for Math, Science and problem-solving; and this, she claimed, accounts for her success in her current employment.

"I think it is family influence, kasi (because) most of us in the family are in STEM."

Supportive Managers and Co-workers

Study participants talked about the enforcement in their companies of the various policies that help female employees perform their office responsibilities while carrying on their maternal and household responsibilities. A good practice is Emerson's participation in the annual celebration of "Women's Month," to highlight the role of females in society. It conducts gender sensitivity seminars and gives awards to outstanding female employees. A study participant noted that, "Workshops and seminars are currently dependent on the developmental needs of employees. If the team leader identifies certain problems of employees, they will be sent to seminars and trainings that could help them improve. Currently, there is also an ILO project conducting seminars for the leadership development of women."

"I have peers and bosses who are very supportive as to what you need for the project."

When asked about the reasons why they stay in their current job, most of the respondents highlighted the many enabling activities and opportunities given by their companies. As noted by the facilitator of the FGD with Pointwest respondents: "She stays because she is given different opportunities to explore different fields. But in the future, she wants to pursue another field that she is interested in, which is a mix of psychology, arts, dance, and technology. For her, ballerinas are free and graceful. She wants to feel this way, too, where she is confident that she can survive in that field."

Personal Interest in STEM-related Skills and Positive Attitude Towards Meeting the "Everyday" Challenges at Work

An important factor to advance women's participation in the STEM industries is their willingness to confront or deal with all the constraints and challenges they encounter in their work and family life. As one respondent says:

"It is not easy... it is not an easy industry to move up (the ladder) either, not like sales or some other function...I think even after seven years, I still have a lot of things to learn. So, I am looking forward to learn more, and maybe, explore other avenues, not just the lab, not just what I am doing right now."

Gender-sensitive Company Policies and Programs

Majority of the research participants in the FGD, KII and online survey claimed that the companies they work with have policies that are sensitive to the situation of needs of female employees. According to them, there is no company bias when it comes to promotion and access to training opportunities. One company has, in fact, instituted a policy to support the needs of lesbians, gays and other persons of different gender identity. The results of the online survey, for instance, show that "around 72% of respondents reported that they made use of internal training opportunities within their organization, while 52% percent have taken part in mentoring programs. A participant in the FGD said that she has stayed in her company because:

"The pay is good. You have a different lifestyle. They are comfortable. You are exposed to a lot of interesting sectors and places. You can travel by being part of the company."

Positive Portrayal in Media of Women in STEM

Another factor mentioned by the research participants that helps promote female participation in traditionally male-dominated jobs has been the support given by the media industry. Female scientists and educators in STEM have been featured in many radio, television, and film shows, as well as in newspapers and print media over the years, highlighting their personal narratives of "breaking the glass ceiling." Based on the KIIs, there is no inequality or discrimination against women in the STEM industry. This is primarily because STEM is a competency-based field. Competency is based on certain metrics of performance which need to be met by a job applicant or one who is seeking promotion. Whether one is male or female, to achieve something, one has to meet or surpass the metrics.

Here are how some interviewees described this:

"Pero, parang basta naman magaling, sa Science and Engineering, yun yung kinaibahan e, kapag magaling, ke babae or lalaki, kahit ano mang kasarinlan, talagang aangat yan e. It doesn't matter. Kasi technical e. May competencies e. So, ke babae or lalaki yan, basta nandun yung competency, walang problema sa pag-hire sa kanila e....Science, ika nga e, gender blind."

"Basically, STEM is merit-based e. The qualifications, the technical skills, the knowhow. I think it wouldn't be any different. If you have the skills, you will be able to show it."

"Lalo na siguro as you go higher. Kung wala kang skills, hindi ka rin mag-c-climb. Siguro sa nature ng exposure ko, I didn't see the discrimination na mayroon ba akong male colleague who was chosen over me. Normally, it's really based on merit. If I have it, then I will be chosen, kung wala siya, so hindi muna siya."

"Siguro, we owe it din to Science, kasi rational ang Science eh. The discipline itself is very rational. You have these indicators, you look for it, the indicators are there, and then, you hire. It's a matter of leveling up the skills of women if we want to have more women in STEM so they won't have that apprehension that they don't have the necessary skills."

There are interviewees as well who commend their organizations/companies and respective leaders who actively encourage the participation of women in the workplace through programs and policies:

"I guess... Well, I'm speaking for the I.T. industry in particular ha. I think it's because women also see opportunities for moving up. I mean, gender is not an issue for you moving up the ladder. The I.T. industries are very open in terms of women taking on more leadership roles. I guess in some industries, they still prefer a certain gender..."

"One good thing about Emerson – grabe yung training namin when it comes to developing leaders. We have a course called 'Leading in Emerson'. The main focus of the course is that at the end of the day, our main job as leaders is to develop our successors. If we don't have that, we don't have people ready to replace us." "Leading in Emerson" is a program that aims to capacitate future leaders of the organization; and adopting Judge Juan Luna High School in Quezon City, as a platform to train and hone young minds towards getting into the STEM academic strand, are some of the initiatives that Emerson has come up with. Regardless of their sexual orientation, participants of the program are chosen based on their capability and relevant skills, and if they have passed/submitted the necessary requirements needed to get accepted.

"For the past 12 years that I've been working, fair naman. Supportive naman yung mga nandito, yung mga bosses, yung management. Equal naman yung treatment. I can't speak for the whole industry. I can only speak based from what I know dito. Equal naman yung treatment nila." Although many of the research respondents claimed that the companies where they work have been generally supportive of their female employees, they likewise mentioned some factors that affect the quality of their office work and personal/family life. These include the following:

Male-centered Work Culture and Environment

In view of the dominance of males in some of the STEM industries, the "norms and standards of work are heavily based on male-related activities and expectations." One of the reasons given for resigning from their job is the failure or difficulty of female employees to cope with the male-centered expectations of their managers and co-workers. Others, had to refuse being promoted because it required moving to an office or factory located far from their residences. The data mentioned in the review of literature, in fact, show that the fields of engineering and related professions is composed of 88% males while the fields of architecture and related profession has around 82% males. Gender-role stereotyping persists in the allocation of work where the use and repair of heavy machines are given to males, while females are assigned to tasks that are "not physically strenuous."

Some of the women who joined the study mentioned some cases of sexual harassment and other discriminatory practices in their companies. They, however, do not know how such cases have been resolved. A female manager, talked of the difficulty of dealing with employee problems and complaints like sexual harassment while having to uphold the good image of her company.

"STEM is not an easy industry to move up. Not like sales, or some other functions... I think you're always in a crossroad, so you have to decide if you want to stay, to pursue your passion, or you have to move to another option that will give you more security."

"There is hiring preference of men against women in the whole STEM field."

Male Dominance of Leadership and Management Positions

One of the research participants said that in the company where she works, there are only two females and seven males in their Board of Directors. This is one of the reasons, some said, why some gender issues persist despite the presence of gender-sensitive company policies.

"The hiring management is dominated by men, so it's hard for women to step up because ... I have a feeling, there's a perception that 'oh, just another woman."

Nonetheless, the other FGD and KII participants have noted the increasing participation of female middle-level managers in the hiring and evaluation of employees as well as in the crafting of company policies and work standards.





Difficulty in Pursuing Work-Family Balance

A major challenge to the married women is the difficulty in meeting the expectations and requirements of their office jobs while attending to the demands of their households. Some talked about the need to tutor their schooling children, attend to the daily concerns of the household before and after office work. The situation of those with husbands working abroad is more difficult since they have to take on the roles commonly done by their spouses.

The women talked about a "detour" metaphor to encapsulate the differing life paths of male and female workers in STEM. Women take a detour from their projected career path when they decide to have children. Women do have opportunities to "get back on track," but would require more effort on their part than their male counterparts.

One challenge women face in the STEM field is in advancing their career, e.g., taking further studies, especially abroad, when they are already married and have their own children. Key to being able to do this, is having a supportive and understanding husband who can temporarily take on more household responsibilities, especially that of taking care of children.

"Possibly, for some women, if you don't have the support group, yung belief that they are doing well in their Science career, mahirap ka magpatuloy e. In her case, ino-offer-an pa siya ng PhD ng Netherlands pero sabi ng husband niya, magkaka-PhD ka nga pero baka wala ka nang asawa pag balik. In her case, it was a decision to go back (home)."

"I know some other friends that if they don't have supportive partners, they would not really do well in their Science-related career. Kasi din, yung studying for higher degrees, required talaga, sacrifice e. For example, sometimes, you have classes, and may mga kids ka, and kung yung partner mo so happens to be the traditional and conventional na "You have to tend to the kids. You have to do everything. You have to take care of me." If they don't have that mindset (non-traditional), mahirap kasi siya."

"For some, they let their career take a backseat. Either they forgo higher studies or lie- low muna. They won't go for higher studies or go for higher positions but they still continue their work.

"In the case of Jacklyn, I always tell her story because it's a very good story of... Successful sila e. Her husband is also a Physicist but it was Jacklyn who finished her PhD first. Her husband allowed her to finish PhD first. And then took care of the kids. Later on, her husband also finished his PhD in Physics. Jacklyn would always tell the story that she owes a lot to the support of her husband." "In the case of my husband, even though I was studying the whole time, less than a month of giving birth, I had to take my compre. My husband has always been supportive of my career. I cannot imagine myself doing nothing... Whatever decisions I had in my career path, he has always been supportive."

"Medyo importante yun... I told that to the students also when I talked in that forum. It's important for women in Science careers to find men who have the right mindset, who are secure of themselves that even though you are achieving and so on, he will be supportive. It doesn't emasculate them if you are achieving so much in your field, especially in Science."

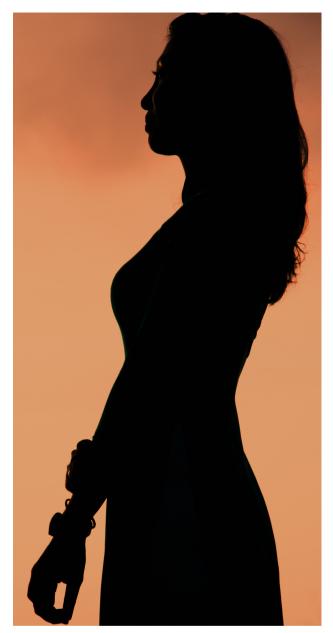
"But I've I known some here in the U.P. community that they are doing so well. May mga anak. Talagang work-life balance like you look at the directors of the institutes, the assistant deans of colleges... Most of the time, I even see them in parents' meeting eh."

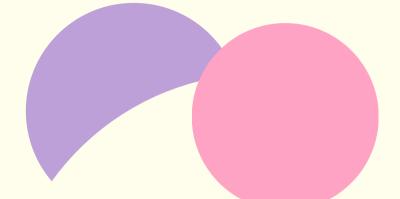
"Medyo kasi iba rin siguro pag higher education. Pag industry kasi na very demand- driven... Ang tertiary kasi, for example, teaching loads, habang pataas yung mga graduate classes mo, you can choose the schedule. Yun yung maganda sa tertiary siguro kasi somehow. May laboratory school kami so pag pumapasa yung anak mo at diyan lang nag-aaral, ang dali mong i-check. Sa setting ng tertiary, mas may magandang support base for women scientists, some science educators. Maganda yung support system ng university. I don't know if I would find the same in the industry (pertaining to the corporate setting)."

The presence of the "glass ceiling" was also mentioned as a major obstacle for women leaders to step up in the STEM industry. Largely felt, it prevents them from penetrating and advancing higher leadership circle. When it comes to the hiring and talent acquisition process, the entry point for every employee, the biggest challenge faced by these women, are the issues of being prematurely rejected through the hiring process due to a number of factors. One good example is being denied simply because the employer fears that a female applicant would undergo pregnancy in the future and will take longer leaves due to family matters. In this case, women are perceived to be nurturing family-caretakers, and consideration of their skillset becomes a secondary/lesser factor for being hired. Most private companies, the IT industry to cite as an example, demands significant amounts of time and effort from the employees themselves, since they are mostly output- and productivity-oriented.

Another example is the **stereotyping of women as a weaker gender compared to men**, most especially in manufacturing, energy, and chemical processing industries, to name a few.

Many of the employers surveyed, think that hiring women is a risk; it means more of a loss for them, since more benefits are given to them, especially those that deal with their reproductive health, e.g., maternity leave and reproductive health leave. Some effective and brilliant women employees would rather choose to resign and stay at home, instead of finding alternative and collaborative solutions with their husbands regarding the care of their children and their eventual assumption of homemaker roles, simply because of the dictates of society regarding gender assignments and decision-making on family affairs.





RESPONDENTS' Recommendations to **Promote Women in Stem Agenda**

Promoting the STEM Industry

- Participants from Pointwest were influenced by their adult figures to pursue a STEM career. These would be their teachers and/or parents who worked in the industry, and other relatives. Their influence was manifested in their advice and/or how they led by example.
- Peers or friends also influenced their decision to pursue a career in the industry. Others were simply intrigued and decided to try it out. The salary and the bright future that came with it also enticed them. Some simply wanted a challenge.
- Others were encouraged by their aptitude in math and science in high school, which led them to choose STEM courses in college. Science high schools also helped them thrive. DOST groups/scholarships were mentioned by two participants from different FGDs as their main motivator to pursue a career in STEM. In the DOST group, one (1) FGD participant related that her training in gender sensitivity empowered her to prove herself in the maledominated field.
- For the participants, improving current working conditions for women was needed. If these would be better for the future generations of women working in the industry, then they would be encouraged to pursue it and stay. This involved mentorship, performance-based promotion, availability of work-from-home benefit, and implementation of their other recommendations in the "CEO for the day" question.
- Promoting awareness about the current context of the industry, as well as of the women working in the industry themselves. For them, promoting the STEM industry as one that is also for women, would contribute to increasing the number of women in STEM fields.
- 50-50 rule: in every meeting, it should be half-women and half-men. This could be expanded to projects, discussions, and other efforts within the company.
- Whenever there is an opportunity, a woman should be tasked to lead projects.
- Mentorship should not be limited to employees only, but also students who are interested in entering the industry. One of the participants shared the opportunities with having STEM as a course to her daughter, which she sees as applicable in many fields within the industry. Focusing on this, for her, is the way to effectively promote it.

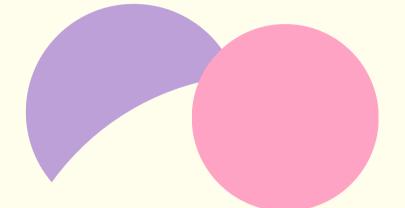
"Right now, you can see the difference between the kids now and the kids before. Yung kids ngayon, nandyan na lahat eh... hindi na-mamassage yung brain nila to think eh... so that's one way to promote to the [new generation] on how to be successful... dun sa STEM."

In contrast to this, another participant from the same group said:

"...yung expectation [ko dati], is a lot, lot higher than what opportunities are there. So for me, we have to educate the children in such a way that they know the reality. Wag yung 'sige, kaya mo yan! Science ka, bright ang future mo dyan,' tapos pag nag-aapplyapply na siya, makikita niya na, ah, ganon lang pala yung trabaho. So parang ma-didishearten kaagad. You have to tell them the reality: it's going to be very difficult, but if you want, if your'e really interested, then go for it. So para lang yung baseline expectation niya, hindi gano'n kataas. I'm speaking

for myself: taas ng expectation ko sa una, so parang after college, 'huh, ba't ganito yung trabaho?' Para bang, akala mo, maraming opportunity, pero actually wala naman."

- Exploring the different parts of the industry and creating networks in various forums or gatherings here was also crucial for one participant. This was where she formed connections and learned about the different kinds of jobs and technologies being developed. This made her better at her job, and also opened her to the different possibilities within STEM and equipped her to consider them as a possibility for herself as well.
- Teaching children about the logic of technology and how everything around them works was crucial to empowering them to take on STEM-related courses and careers. It empowers them in school, where they are also able to educate their peers, creating a ripple effect of awareness about how technology works. They see this as a necessity also because children grow up with gadgets just all around them and not really understanding them. This could also serve as a future avenue for them to be enlightened about the possible careers they could pursue with sufficient knowledge about technology.
- For others, it was just a matter of exposure to STEM, and not necessarily pushing them to take careers here. They wanted them to have the freedom to choose. It was just a matter of introduction for some.
- It is necessary to teach the everyday application of IT, which would not necessarily be dealing with technology itself. It could be taught in terms of finding the most efficient and effective way to wash dishes so that they could watch television sooner. For her, the younger generation must be encouraged to think.



HIGHLIGHTS OF ONLINE SURVEY RESULTS

STEM CAREER CONSIDERATIONS



What are the reasons that drive women to pursue a career within the STEM industry?





2) Chances to pursue meaningful work



3) Job security and stability

4)



Competitive earnings and benefits

CONSIDERATIONS	Not important	Slightly important	Important	Very Important
lab accurity and stability	1	-	14	54
Job security and stability	1.45%		20.29%	78.26%
A flexible work schedule	1	2	25	41
and culture	1.45%	2.90%	36.23%	59.42%
Competitive earnings	1	1	14	53
and benefits	1.45%	1.45%	20.29%	76.81%
Opportunities to learn	1	-	11	57
and grow	1.45%		15.94%	82.61%
A fun work environment	1	4	21	43
A full work environment	1.45%	5.80%	30.43%	62.32%
Long term career	1	1	14	53
prospects	1.45%	1.45%	20.29%	76.81%
Manania afril	1	-	12	56
Meaningful work	1.45%		17.39%	81.16%



In general, respondents are satisfied with their current STEM job.

FACTORS	n	%	95% C.I.
Self	35	46.66%	35.48 - 58.19
Career prospects	35	46.66%	35.48 - 58.19
Parents	13	17.33%	10.21 - 27.88
Teacher or other role model in school	8	10.66%	5.33 - 20.18
Other relatives	7	9.33%	4.43 - 18.58
Role model outside of school	3	4.00%	1.26 - 11.96
Others	4	5.33%	1.97 - 13.63

INSPIRATIONS **TO WORK IN STEM**





Chose STEM based on own decision



Chose STEM based on the promise of a better career in these industries

4 %

Attributed their STEM career to a role model outside of their school

43

JOB SATISFACTION OF WOMEN IN STEM

Women enter the STEM industry for reasons that are related to gaining the opportunity to be in charge and be somebody in the industry, to realize their full potential as STEM industry leaders, to do something different within the industry and as compared to the usual jobs people have, and for the steady employment that the industry presents to them.



CONSIDERATIONS	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Daing able to keep by an all the time	1	4	18	39	7
Being able to keep busy all the time	1.45%	5.80%	26.09%	56.52%	10.14%
The change to work along on the ich	1	6	17	37	8
The chance to work alone on the job	1.45%	8.70%	24.64%	53.62%	11.59%
The chance to do something	2	6	13	34	14
different from time to time	2.90%	8.70%	18.84%	49.28%	20.29%
The chance to be somebody in the	3	3	13	40	10
community	4.35%	4.35%	18.84%	57.97%	14.49%
The way my boss handles his/her	1	3	16	39	10
coworkers	1.45%	4.35%	23.19%	56.52%	14.49%
The competence of my supervisor in	2	7	23	30	7
making decisions	2.90%	10.14%	33.33%	43.48%	10.14%
Being able to do things that don't go	2	8	19	31	9
against my conscience	2.90%	11.59%	27.54%	44.93%	13.04%
The way my job provides for steady	-	3	14	33	19
employment	-	4.35%	20.29%	47.83%	27.54%
The chance to do things for other people	1	2	13	42	11
	1.45%	2.90%	18.84%	60.87%	15.94%
The chance to tell people what to do	-	4	13	40	12
	-	5.80%	18.84%	57.97%	17.39%
The chance to do something that	1	9	12	34	13
makes use of my abilities	1.45%	13.04%	17.39%	49.28%	18.84%
The way company policies are put	1	7	13	37	11
into practice	1.45%	10.14%	18.84%	53.62%	15.94%
The amount of pay and the amount	2	10	15	37	5
of work that I do	2.90%	14.49%	21.74%	53.62%	7.25%
The chances for advancement in	1	9	14	36	9
this job	1.45%	13.04%	20.29%	52.17%	13.04%
The freedom to use my own	2	6	15	37	9
judgement	2.90%	8.70%	21.74%	53.62%	13.04%
The chance to try my own methods	-	2	14	42	11
of doing the job	-	2.90%	20.29%	60.87%	15.94%
The working conditions	1	5	13	41	9
The working conditions	1.45%	7.25%	18.84%	59.42%	13.04%
The way my co-workers get along	2	10	12	42	3
with each other	2.90%	14.49%	17.39%	60.87%	4.35%
	5	9	23	26	6
The praise I get for doing a good job	7.25%	13.04%	33.33%	37.68%	8.70%
The feeling of accomplishment from	4	7	16	35	7
the job	5.80%	10.14%	23.19%	50.72%	10.14%



Chance to do something different from time to time



Chance to do something that make use of my abilities

1)

The amount of praise they receive for a job well done

LOWEST RATED FACTORS



The amount of pay given the work that they do

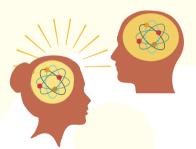


Perceived competence of their supervisor

PERSONAL DEVELOPMENT OPPORTUNITIES IN CURRENT WORKPLACE



90% are aware of various opportunities for personal development							
Aware of opportunities for personal development	n	%	95% C.I.				
Yes	55	90.16%	79.38 - 95.61				
No	4	6.55%	2.41 - 16.61				
Not certain	2	3.27%	0.78 - 12.62				
TOTAL	61						



52 %

Make use of mentoring or coaching programs within their company

OPPORTUNITIES	n	%	95% C.I.
Internal training opportunities	54	72.00%	60.55 - 81.15
Mentoring/coaching program	39	52.00%	40.52 - 63.26
External training opportunities	26	34.66%	24.59 - 46.33
External networking opportunities	11	14.66%	8.19 - 24.85
No personal development available	5	6.66%	2.74 - 15.31
Others	2	2.66%	0.64 - 10.34



72 %

Access internal training within their company more than any other personal development opportunities

WORKPLACE ENVIRONMENT (Personal factors)



Online respondents were asked to rate different environmental factors in their company. They were also asked to rate other companies in their industry about these environmental factors.

In general, respondents rated factors relating to their own work environment and culture favorably. They also rated other companies in their industry as generally favorable, but when compared to their own respective companies, respondents tend to rate their own company higher in environmental factors than other companies in their industry.

PERSONAL FACTORS	Strongly disagree	Disagree	Neither	Agree	Strongly agree			
Feeling valued								
	2	7	8	41	7			
In respondent's company	3.08%	10.77%	12.31%	63.08%	10.77%			
Monon in other componing	2	6	14	37	6			
Women in other companies	3.08%	9.23%	21.54%	56.92%	9.23%			
Happy to be identified by own gender								
1	1	3	8	39	14			
In respondent's company	1.54%	4.62%	12.31%	60%	21.54%			
Momon in other companies	1	5	12	35	12			
Women in other companies	1.54%	7.69%	18.46%	53.85%	18.46%			
Believe that certain roles are better suited to a particular gender								
In respondente company	8	16	15	20	6			
In respondent's company	12.31%	24.62%	23.08%	30.77%	9.23%			



Feel valued by their company

62 % Think that women in other companies are valued

74 %

72 %

are happy that they're identified by their gender in their company

think that women in other companies are happy to be identified by their gender



74 %

40 %

feel that certain roles in their company are suited to a particular gender

COMPENSATION & ADVANCEMENT IN THE STEM WORKPLACE

Respondents perceive equality in compensation and advancement in other companies differently. They perceive other companies to:

- (1) prioritize leadership positions in other companies;
- (2) equal compensation, followed closely by providing;
- (3) equal professional opportunities and,
- (4) equal consideration for promotion.

FACTORS	Strongly disagree	Disagree	Neither	Agree	Strongly agree
Think that women are eq		sated for the		of work and	effort as
In respondent's company	1	8	9	39	8
in respondent's company	1.54%	12.31%	13.85%	60%	12.31%
Women in other companies	1	11	16	31	6
	1.54%	16.92%	24.62%	47.69%	9.23%
Feel that women are	equally consid	lered for pro	omotion as r	nale counter	parts
In respondent's company	3	4	9	40	9
	4.62%	6.15%	13.85%	61.54%	13.85%
····· · ·	1	9	22	26	7
Women in other companies	1.54%	13.85%	33.85%	40%	10.77%
Believe that	t there are end	ugh women	n in leadersh	ip roles	
In reconcident's company	7	7	8	33	10
In respondent's company	10.77%	10.77%	12.31%	50.77%	15.38%
\A/iii	1	7	23	27	7
Women in other companies	1.54%	10.77%	35.38%	41.54%	10.77%
Think that companies tak ti	e adequate st ne same profe	•		and women	are given
In roonondont's company:	3	4	8	43	7
In respondent's company	4.62%	6.15%	12.31%	66.15%	10.77%
\A/	1	6	25	29	4
Women in other companies	1.54%	9.23%	38.46%	44.62%	6.15%

The highest-rated work environment factor for compensation and advancement is that of equal consideration for promotion among men and women in their company. Those who agree and strongly agree that this is the work environment they find themselves in is 75% of the respondents.

Additionally, 72% think that women are equally compensated for the same level of work and effort as male counterparts. 66% believe that there are enough women in leadership roles and 77% think that companies take adequate steps to ensure that men and women are given the same professional opportunities.



COMPENSATION & ADVANCEMENT IN THE STEM WORKPLACE (CONTINUED)



72 % Feel that women in their company are equally compensated as their male counterparts.



Think that women in other companies are compensated equally as men.





51 %

66 %

52 %

hink that there are enough women in

Feel that there are enough women in leadership roles in their own companies.

Think that there are enough women in leadership roles in other companies.

77 9 Think that their company takes adequate steps in ensuring women and men get the same opportunities.

Think that other companies ensure gender equality in terms of professional opportunities



SEXUAL HARASSMENT AND DISCRIMINATION





Think that sexual harassment is a problem in their company.

32 %

Think that sexual harassment is a problem in other companies.

FACTORS	Strongly disagree	Disagree	Neither	Agree	Strongly agree
Sexu	ual harassment i	s a problem in	the company		
I	18	29	9	7	-
In respondent's company	28.57%	46.03%	14.29%	11.11%	-
Women in other companies	5	9	29	20	-
	7.94%	14.29%	46.03%	31.75%	-
Believ	/e that companie	s tolerate sex	ual harassme	nt	
In respondent's company	23	30	6	3	1
	36.51%	47.62%	9.52%	4.76%	1.59%
\//	11	16	32	4	-
Women in other companies	17.46%	25.40%	50.79%	6.35%	-
Company has adequate mecha	nism in place to	address issue	s of sexual ha	arassment in th	e workplace
I	5	6	13	34	5
In respondent's company	7.94%	9.52%	20.63%	53.97%	7.94%
· · · · ·	3	5	31	21	3
Women in other companies	4.76%	7.94%	49.21%	33.33%	4.76%

7 %

Think that their company tolerates sexual harassment.

11 %

Have experienced sexual harassment in their place of work.



62 %

Believe that their company has adequate mechanisms in place to address sexual harassment.

38 %

Think that other companies have mechanisms in place to address sexual harassment.

SEXUAL HARASSMENT AND DISCRIMINATION (CONTINUED)







have experienced sexual harassment, but none had reported or filed a case

SEXUAL HARASSMENT	n		%		95% C.I.		
Experienced sexual harassment in the workplace							
Yes	7	1	1.11%		5.27 - 21.89		
No	56	88	8.88%		78.10 - 94.72		
Experienced sexual harassn	Experienced sexual harassment in the workplace and reported it						
Yes			-		-		
No	7	1	100%		-		
SEXUAL DISCRIMINATION	n	n %		95% C.I.			
Experienced sexual di	iscrimina	ation	in the wo	rkpl	ace		
Yes	5	5 7.93%		ó	3.26 - 18.06		
No	58		92.069	%	81.93 - 96.73		
Experienced sexual discrimin	Experienced sexual discrimination in the workplace and reported it						

 Yes

 No
 5
 100%

It is alarming to note that 11.11% of the online survey respondents have experienced sexual harassment in the workplace and did not report it to any one in their company.

Those who have experienced sexual discrimination in the workplace accounted for 8% and did not report it as well.

RESPONDING TO WOMEN'S NEEDS



Majority of the respondents think that work conditions in their companies are responsive to the needs of women as well as to those who are currently raising children.

FACTORS	Strongly disagree	Disagree	Neither	Agree	Strongly agree
Think that work conditi	ons in compa	nies are resp	onsive to the	needs of won	nen
In respondent's company	1	3	6	44	9
In respondent's company	1.59%	4.76%	9.52%	68.84%	14.29%
Women in other companies	-	2	22	32	5
	-	6.35%	34.92%	50.79%	7.94%
Believe that work conditions		s are respons raising childi		eds of women	who are
In respondent's company	2	4	10	39	8
In respondent's company	3.17%	6.35%	15.87%	61.90%	12.70%
Women in other companies	-	4	25	30	4
Women in other companies	-	6.35%	39.68%	47.62%	6.35%
Believe that wom	en cannot be	assertive and	l confrontatio	onal as men	
In recordentia compony	9	23	10	18	3
In respondent's company	14.29%	36.51%	15.87%	28.57%	4.76%
······································	5	15	25	15	3
Women in other companies	7.94%	23.81%	39.68%	23.81%	4.76%

STEM CAREER TURNOVER

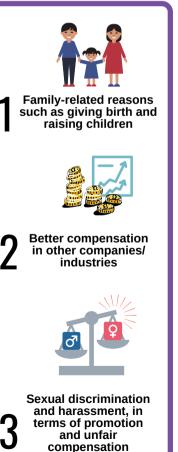
When asked about why they think (1) women leave their own company and (2) their industry in general, responses coalesce around three major themes:

- (a) family-related reasons,
- (b) better compensation and advancement opportunities in other companies, and (c) sexual discrimination and harassment.

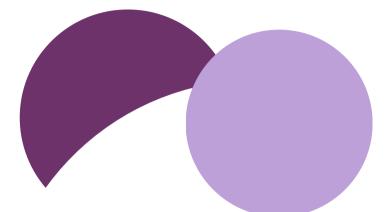
Family-related reasons such as needing more time to take care of their children and other dependents, taking care of family responsibilities, and wanting more time spent with their family are typical responses relating to this reason.

In terms of compensation and advancement, respondents believe that women leave their company and industry because there are better financial opportunities elsewhere. They talk of better benefits, more fair compensation, or wanting to put up their own business as more lucrative than working at their current job and industry.

Respondents surface the theme of discrimination in the workplace as another reason to leave their company and the industry as well, citing unfair compensation when compared to men in their company, unequal opportunities for advancement because of their gender, and the like.



compared to men



CONCLUSIONS AND **Recommendations** For the stem industry

Conclusions and Recommendations

This baseline study validates the findings of previous studies that the STEM industries, particularly the fields of engineering, architecture and related fields as well as the life science fields continue to valorize and practice many malecentered norms and work practices. While some companies have already institutionalized gender-sensitive work arrangements and provided various opportunities for women to learn new skills and advance in their careers, personal factors like giving birth and child care sometimes prevent them from taking advantage of such opportunities. The study has shown many good practices in terms of providing an enabling work environment for females such as the existence and implementation of gender-sensitive policies and programs, gender-equal office culture, and internal structures that address sexual harassment anonymously and effectively. These have to be continued and sustained. It has also provided valuable insight on the view of the culture of STEM as a catalyst to realizing gender equality, where those who work in the industry are judged based on certain metrics of performance. Regardless of gender, they are judged according to these standards set by the companies that employ them without bias.

Although most of the respondents agreed that they have positive experiences in the workplace, we have to take into account the spectrum of responses of all participants. We cannot disregard the fact that there are respondents who are with the opposite side of the spectrum, that is strongly disagreeing, disagreeing or neutral about the considerations that they rated. The considerations that most respondents rated to be unsatisfactory and very unsatisfactory include the praise they get for doing a good job, the way their coworkers get along with each other, the amount of pay and the amount of work they do, the feeling of accomplishment from their job, the chances of advancement in their job, being able to do things that do not go against their conscience and the chance to do something that makes use of their abilities.

Furthermore, those who felt that they were discriminated against or sexually harassed and did not report such incidents are strong indications of the lack of institutionalized support for women in STEM. These negative responses merit further research since they will continuously erode whatever cumulative efforts were spent on gaining gender equality in the workplace. We highlight the need for these participants to surface and seek to address those incidents, rather than edifying the status quo by virtue of putting more weight on the positive responses.

Although the middle and top management women in STEM reported that promotions and climbing up the career ladder is based on merit ("*Basically, STEM is merit-based… The qualifications, the technical skills, the know-how. I think it wouldn't be any different. If you have the skills, you will be able to show it.*"), we still need to allow the voices of the respondents who thought otherwise be heard (some employers would think that hiring women means more loss for them since more benefits are given to them, especially the ones that deal with their reproductive health such as maternity leave). While those who are already at the top, expressed affirmative feelings about gender equality in STEM, we should not forget that they had extraordinary support from either their spouses or family at large. However, these successful women in STEM are the minority only. This follows the tenets of action research, to diagnose and assess weaknesses and problems and to develop practical solutions to them so that gender equality becomes an experience for all.

Moreover, the STEM industries can be enjoined to adopt the following recommendations:



Institutionalize the provision of gender-sensitivity trainings to all new hires, regular employees and to all the officers and members of the board of directors. The capacity-building activities can include the topics like the use of non-sexist language, anti-sexual harassment and orientation to the various laws against rape, physical and emotional abuse, child abuse, as well as labor and sex trafficking.



Review, and if needed, incorporate in current company policies and programs that can encourage women to apply for jobs in currently male-dominated fields. The review/revision of current company policies can also include measures prevent the commission of sexist and misogynist behaviors.



Institute special programs to enhance the capacity of women to assume leadership roles and positions. These can include more sustained exposure and mentoring for them to venture into traditionally male-dominated positions.

Conclusions and Recommendations (Continued)

The goal of enhancing the participation of females in male-dominated STEM industries can only succeed with the cooperation of other institutions. The educational system, primarily the high school and college tracks, must actively participate in efforts to encourage females to enter the fields of STEM. Some possible programs can include the provision of scholarships and pre-graduation exposure to science and technology-related jobs.

It is likewise important to include in all programs and services of STEM companies all the laws and government guidelines for the promotion of gender equality in the country. The Philippine Commission on Women provides these guidelines, specifically the steps that have to be taken by both public and private organizations to develop a Gender and Development (GAD) Plan which should solve or respond to the identified gender issues of their employees, management and customers. The goal of gender equality, as enshrined in the 1987 Philippine Constitution, is currently being pursued through the principle of gender equity, "in which certain interventions are employed to compensate for the historical and social disadvantages suffered by women, thereby, leveling the playing field for the sexes." Such interventions are presently guided by the government's Gender Equality and Women's Empowerment Framework (GEWEF). It identifies actions that can effectively address the gender issues and biases against women along five levels of empowerment – at the levels of welfare, access, conscientization, participation, and control".

The Gender and Development Plan can include the following inputs:

- sex-disaggregation of company data/files to include such information as marital status, age, number of children, etc.
- conduct gender-sensitivity seminars for incoming employees and various gender-related training activities for regular employees (i.e. orientation to laws for gender equality such as the Extended Maternity Law, the Solo Parent Act, the Violence Against Women and Children Law, etc.)
- inclusion of female employees in all training activities that can improve their knowledge and skills in science and technology-related work.

Finally, the goal of increasing women's participation in male-dominated STEM industries can be achieved faster and in more sustainable ways with the strong partnership of various government agencies and academic institutions with the private sector. Projects like this one should be continued and expanded to include other geographic areas and STEM industries.

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