YOUTH THINK TANK REPORT:

What Makes Young Women Successful in STEM Careers

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ON THE COVER:

LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Preface

The world is advancing everyday thanks to the strides that are being made in the fields of science, technology, engineering, and mathematics (STEM). Young people are a driving force within this sector. However, not all young people are equally represented there; the sector is dominated by young men. So, in 2019, we came together as a group of young researchers from seven Sub-Saharan African countries to understand why that is, and what can be done to change it.

Through our research, we learned the answer directly from the people with the most insight into it: the young women who are developing careers in this sector. We spoke with young female STEM professionals in Ghana, Kenya, Malawi, Rwanda, Tanzania, Uganda, and Zambia about their journeys. We learned what motivated them to enter the sector, who supported them, and the steps that they took to develop careers there.

The young women we spoke with are already engaged in the STEM sector. Maybe for that reason, we learned less about the barriers they have faced — though they definitely exist — and more about what has made them successful. So we shifted the focus of the report to look at exactly that: what makes a young woman successful in this sector? We hope that we have thus learned what is needed for other young women to succeed, too.

We did not leave that question only up to our own interpretation. We asked these women what advice they have for other young women interested in joining this sector. They gave clear guidance to their peers that we highlight near the end of the report, and that we feel is a key outcome of the research.

With this report, we call on development practitioners, donors, governments, and private sector actors to act in line with what young women say they need. STEM is a growing sector that will only offer more opportunities to young people. These opportunities must be accessible to young women so they can help design changing societies in line with their needs.

We enjoyed listening to the experiences of fellow young people just as much as they enjoyed sharing them. It was from this experience that we realized there can be nothing about us, without us. As young people we are best placed to capture the voices of young people like us.

Before this project, we thought research could only be done by professionals and academics. However, with support and training from the Mastercard Foundation and Restless Development, we took a youth-led approach to this research. We were able to collect real data on the experiences of our peers that is often missed in conventional research approaches. This process improved our leadership skills and helped us build relationships with peers in our communities.

We extend our appreciation and a vote of thanks to our fellow young researchers for their passion and commitment in getting this report done. We also thank all the young women we gathered these insights from. Finally, we thank the Mastercard Foundation in partnership with Restless Development for their support in empowering the next generation of young leaders using the youth-led research approach. With their help, the future of research is in great hands.

2019-2021 Youth Think Tank Cohort.

Executive Summary

Over the past six years, through the Youth Think Tank, we have been building a youth-led evidence base of young people's economic opportunities in Sub-Saharan Africa. Working with young researchers, we have looked into the barriers and opportunities that young people in different sectors face. However, we have not yet focused specifically on young women's employment. Through this research, we do exactly that.

To focus our research, we examined a specific, exemplary sector — the STEM (science, technology, engineering, and mathematics) sector. We chose it for two key reasons. First, we want to focus on where the economic opportunities for youth are, and this is one of the sectors that we expect to grow over the next decade. Second, while this sector is growing, young women's involvement in it is not keeping up. Young women are still underrepresented in STEM fields in Africa.

Within this gap, there is an opportunity: if we can find out what makes a young woman successful in this sector, we can target support to help as many other women as possible. That is the focus of this report. Our research shows that young women can be powerful leaders in this sector, creating practical solutions for women and for society at large. Our research also shows what supports them in doing so.

This report includes findings drawn from the narratives of over 150 young female STEM professionals in seven countries. We noticed themes in how young women discuss their success in this sector. Every young woman we spoke with started by talking about the aspects of who she is that make her successful. They each then spoke about the people who have supported them. Finally, they described the challenges and opportunities they experienced along the way: in training institutions, in employment searches, and in jobs on a daily basis. For these young women, people matter most.

The report below follows the same structure through which young women understand their own success. Here are some key elements that we learned about:

The strength of their characters.

These young women are their own biggest champions. They have a confidence that helps them to deal with the challenges and setbacks that they face. This is strengthened by a clear vision that acts as their 'true North' so they do not get distracted by these setbacks. They are also not afraid of challenging gender norms; for many, this is the reason they sought out the STEM sector in the first place. What has inspired them is its practical nature: it is focused on solution-building, and so they can ensure those solutions are designed with their needs in mind.

We must foster similar traits in other young women if we are to support them explore careers in this sector. We must show them that they can use its tools to solve problems they and their peers face. We must also develop their confidence, and support their potential through goal-setting exercises.

The importance of support systems.

People matter most in these young women's journeys. It was rare for young women we spoke with to not mention the people who supported and encouraged them. Parents — and particularly fathers — played a key role in their early and continued interest in these careers. Romantic partners also come to be a powerful supporting force. However, the most important person for these women is their mentor. Almost every young woman we spoke with described a specific mentor who was crucial to her journey.

Because the mentor relationship is so central, if we invest in nothing else, it should be in connecting young women with mentors — particularly female mentors — who are active in the sector. Mentors are most valuable when they give emotional support as well as access to opportunities: for skill-building, for practical experience, and for leadership. Mentors with the most impact are those who are not one-time role models but are instead committed allies.

Because young women rely on others in their life for support when their confidence falters, we cannot focus on young women alone. We must target their families — particularly their parents — and their future romantic partners if we want to see them supported to succeed.

The role of the professional landscape.

The young women we spoke to described largely supportive training and hiring environments. The training institutions were welcoming, and at times took care to encourage young women who showed an interest in this sector. In the hiring environments, there were a few cases of gender discrimination, but an increasing focus on hiring young women to balance teams. Where the women struggled most was with the day-to-day delivery of their work. They faced challenges from male colleagues and clients, who they needed to regularly prove their abilities to.

Despite gains that have been made, career success is not assured when a young woman gets a job. She also has to perform in that role and needs opportunities to develop professionally. The experiences of women we spoke to show that more needs to be done to change work cultures so that female talent is meaningfully included.

The advice to their 'younger sisters.'

Perhaps the most important question that we asked is what advice these women have for other young women who are interested in this sector. Here are some core messages that came out:

- Follow your passion, not what people tell you to do;
- Be strong and determined, focusing on your goals above all else;
- Value your potential, as a woman, and take pride in tackling gender norms;
- Intentionally build your network and seek mentorship;
- There is no one better placed to design solutions for women than you.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Our Youth-Led Research Methodology

We are sharing our findings as 21 members of the Mastercard Foundation Youth Think Tank. We come from, and collected data in, seven African countries: Ghana, Kenya, Malawi, Rwanda, Tanzania, Uganda, and Zambia. We used Restless Development's youth-led research methodology, and we led every step of the research process. Our findings reflect the lived realities of young people, captured by young people.

RESEARCH CONTEXT

Throughout the Youth Think Tank's five-year history, we have focused on a number of topics in youth economic opportunities. With every report, we have had something to say about the experience of young women in that area. However, while we know that a young woman's gender impacts her economic opportunities, we have never had enough data to comment specifically on how it does so. This is precisely the evidence base we wanted to invest in building, starting with this report.

Examining how gender and economic opportunity intersect would be too wide a focus for a single study. We therefore chose STEM as our sector of interest. We selected it both because it is a growing sector likely to offer more employment opportunities in the near future, and because it is still a male-dominated sector that women struggle to enter.

In global conversations on the future of work, careers in the STEM sector are thought likely to become more relevant. In particular, in Sub-Saharan Africa, the digital revolution will probably create jobs rather than disrupt them, particularly in high-skilled technical STEM roles. Despite this potential, in Africa young women are still a minority in the workforce in STEM and face several barriers to participating in it. Similarly, young women are underrepresented in STEM-related courses, largely because of gender-based barriers. Increasing their participation in the STEM sector is important for promoting gender equality, and it also makes economic sense.

Therefore, more investment is needed to identify how to address the barriers young women face in participating in the STEM sector. Our research suggests that young women who have already built careers there have the most insight into what works best.

RESEARCH FOCUS

Our research objective is to understand what it takes to help young women develop meaningful careers in the STEM sector. We took this as our primary research question:

What makes a young woman successful when pursuing a career in STEM?

To understand young women's success, we need to look at how they got there. We understand that success is not something that happens in an instant; rather, it is a complex journey with multiple steps. Therefore, to better understand these journeys, we adopted the following secondary research questions:

- What inspired young women to join the STEM sector, and what about their attributes or qualifications supported them to do so?
- Considering how gender norms impact whether STEM is an 'appropriate' sector, how do the people in young women's lives see these career choices?
- Which barriers and which enabling factors do young women face in seeking skill-building and employment opportunities in this sector?
- Once in the sector, which gender-based challenges do young women face on a day-to-day basis?
- What advice do these young women have for the next generation of female STEM professionals?

COVID-19 Adaptation: Research Focus

Our research focus is to identify which enabling factors support young women to explore gender-non-traditional careers. In this report, we focus specifically on young women in STEM careers. However, we take an intersectional approach to gender and acknowledge that not all young women's experiences are the same. At first we wanted to compare two very different sectors that attract very different young women to consider what stays constant across young women's experiences and what does not. To do so, we were hoping to compare the career journeys of highly educated young women in STEM with young female construction workers, with an emphasis on those who are informally employed in roles focused on manual labour.

Unfortunately, given the COVID-19 pandemic, we were unable to do so. With movement restrictions, it was far easier to identify and gather better-connected and better-off young women in STEM. Additionally, the impacts of the pandemic and related restrictions on the construction sector meant that there were fewer construction workers still employed to identify in the first place. However, we suggest that future research continue the conversation started here to include other sectors that engage different types of young women. This way, we can dig deeper into young women's collective experience in gender-non-traditional careers.

For the sake of this study, we have our own definition of what a 'STEM' career is. We have taken STEM to include careers in science, technology, engineering, and mathematics, however we have not included careers in medicine, although some other stakeholders do. We have done this because we find that careers in medicine, the qualifications needed to pursue them, and how those journeys evolve are unique.

DESIGN, SAMPLING, AND DATA COLLECTION

We used a purely qualitative design for this research as the best way to capture young women's experiences in detail and as a whole. Specifically, we focused on semi-structured interviews guided by key prompts to encourage young women to talk about all the steps they've taken. We felt that this one-on-one approach could best capture the detail we desired. This emphasis guided us away from other research methods. We decided not to use closed-ended questions in a survey format that would treat steps of a woman's journey in isolation. We similarly chose not to put young women in focus groups, to avoid having discussion and debate dilute their stories. While these data do not represent all young people, we captured a detailed picture of young women's realities that is often lost in large-scale quantitative studies.

We conducted our interviews between January and November 2020. Respondents were purposively sampled to ensure that their experience was relevant to our research questions. This included being currently employed in the STEM sector. Table 1 summarizes the number of interviews that we conducted per country.

TABLE 1. SEMI-STRUCTURED INTERVIEW RESPONDENTS BY COUNTRY

COUNTRY	TARGET	ACTUAL
Ghana	25	18
Kenya	25	26
Malawi	25	20
Rwanda	25	30
Tanzania	25	25
Uganda	25	19
Zambia	25	29
Total	175	167

We aimed to conduct 25 interviews per country. In some countries, we exceeded this target. However, there were countries where we were unable to meet it. This was because of the impact of COVID-19 on the data collection timelines and of COVID-19 restrictions on researchers' ability to gather respondents. However, we are confident that this number of interviews was sufficient for our research questions because we saw similar themes emerging from the data both within and between countries.

COVID-19 Adaptation: Data Collection

Unfortunately, COVID-19 interrupted our data collection period, and our researchers had to pause in the middle of it, due both to national lockdowns and concerns for their safety. However, we were later able to resume data collection once we had adapted our procedures to minimize risk. Researchers continued to gather participants physically, but did so only while wearing Personal Protection Equipment (PPE) and only when necessary. Where possible, they focused on remote, digital connection. Interviews were then conducted by phone to lower the risk to both the researcher and the respondent. This could have had an impact on the rapport developed between the researcher and the respondent, affecting data depth and quality. Whereas data would ordinarily have been analyzed with all researchers together, we moved our analysis to a virtual workshop.

Ahead of any data collection, we secured ethical approval from national review boards in each of the countries the study was conducted in. All data collection was conducted in local languages. Data were captured through audio recordings using tablets and later transcribed and translated into English.

We focused on getting a high representation of diversity across STEM fields. So, our data are not able to speak to the specific experiences of young women engaged in specific STEM careers. Additionally, because of our research methodology, we are not able speak to others' views of young women seeking STEM careers, such as educators and employers. Our data does suggest though that such perspectives are not nearly as relevant to young women as those in their support network. Finally, we chose to focus only on young women who are actively working in the sector. In addition to being easier to find, these young women are better able to unpack the steps they have taken to get where they are. While they have faced barriers on their journey, this design favours those who have overcome such barriers. We did not include those women who were unable to enter employment in the sector. We focused on what makes these successful young women successful, as opposed to looking at the barriers they face, since their success implies that they might not have faced as many barriers as others.

ANALYSIS

We took an inductive approach to our data analysis, and identified themes emerging from a deep reading of the data instead of coding based on pre-specified codes of interest. We did so because we wanted young women's narratives to speak for themselves. We also had fewer hypotheses to test about what makes a young woman successful in STEM careers. We later organized these themes into specific findings, supported by the evidence of direct quotations.

In this process, we transcribed and translated the primary data. We then did a deep reading of the data to identify emerging patterns that could be developed into themes. We re-checked the themes against our data to ensure that they were all well supported. Finally, we mapped the themes against one another, drawing connections between them, and described them in detail.

The report was then written under the leadership of seven young researchers from Ghana, Malawi, Tanzania, Rwanda, Uganda, and Zambia. They created a draft report that was peer-reviewed by the other young researchers. This is in line with our commitment to promoting youth leadership at every stage of the research cycle. It helped to ensure that the report captures the insights gained from the young researchers' experience in the field and their direct interactions with respondents.

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VALIDATION

Traditionally, according to our youth-led research methodology, we would have complemented our analysis with validation workshops held with participants in the research process. During these workshops, we would have presented the research findings to participants to ensure that their voices were accurately captured. However, because of COVID-19 restrictions, and because of our respondents' busy work schedules, we were unable to hold these workshops virtually.

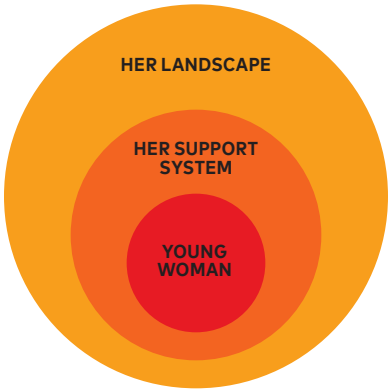
Instead, we will include elements of this validation process in how we distribute the findings of this report and, therefore, how we structure conversations about the findings included in it.

REPORT STRUCTURE

Because we allowed themes to arise organically, we left the structure of our findings flexible, to be directed by what we found. Therefore, the structure of the report that follows is based on how young women themselves described what has supported their career journeys.

When young female STEM professionals narrated their journeys, they focused first on themselves — on their own motivations to join the sector and on the personal traits that supported their ambitions. They next discussed the influence of the people around them: their families, peers, partners, etc. They paid particular attention to those in their support system who have been key to their success. Finally, they talked about the broader landscape along their career journey, from securing training to seeking employment to growing their careers. They explained the barriers they faced and the enabling factors that supported them. The figure below shows this visually:

FIGURE 1. HOW YOUNG WOMEN IN STEM UNDERSTAND THEIR EXPERIENCES



Our report is structured in parallel to how young women understand their lives, so that we can see their lives from the same perspective they do. Our first section focuses on the young women themselves, followed by their support systems, and then the landscapes that surround them.

When young female STEM professionals narrated their journeys, they focused first on themselves — on their own motivations to join the sector...

A YOUNG WOMAN HERSELF

When young women described their STEM career journeys, they each started their narration with themselves, explaining their personal motivations for joining the sector. When examining their stories it became clear that there were certain traits common among these young women beyond their interest in a specific field or career. They had a passion for their fields, which they saw as areas for problem-solving. Their passion was increased by early success in related subject areas. They also had key personal attributes that supported their passion: a high level of confidence, a goal-oriented perspective, and a desire to challenge what is expected of them.

Young women overwhelmingly spoke of the passion that they had for their chosen field, sparked by its practical application and by their initial academic success in these areas.

The young women we spoke with regularly mentioned how passionate they were about their chosen careers and how that passion motivated them. For example, a Ugandan engineer said, "It's something I've always been passionate about. I liked physical sciences, and I used to think engineers are really cool people." A Tanzanian engineer echoed this, saying of her interest in engineering, "I think it was just passion. You know, if you do what you love, you will be doing it with all of your efforts." These are just two quotations, but the young women we spoke with regularly talked of their passion for their chosen fields.

Something else is obvious in the explanation of the young Tanzanian engineer. For her, it is passion that drives her energy for her career. A young Rwandan statistician mentioned something similar, saying, "I loved mathematics. You cannot engage yourself in things that you do not like. When I was still young, I used to wonder, 'How can I use mathematics in so profitable a way that I can earn money from it?'" For her too then, passion was necessary for investing in her chosen career.

Other young women explained where their passion for their field came from. Several described that it was the practical nature of their sector that made them passionate about it: that they were designing solutions to real-world problems and that the tools of their field helped them understand these problems.

They often connected this with an early childhood interest in finding out "how everything works," as a Zambian biomedical technician explained. A Kenyan mechanical engineer identified a specific moment that sparked her interest, recalling a class tour and saying, "I remember we went to the Coca Cola bottlers in Kisumu. You see the way the machines are moving, and everything was automated. I just got interested. It captured my attention." Wanting to learn how everything worked was what led her to pursue a career in mechanical engineering.

A Kenyan web developer mentioned that learning how to manipulate information systems was what inspired her to pursue her chosen career, saying, "I loved the way things would change on my browser when I do things on my backing. When I code and I refresh, things are just changing up...[That brought my] passion and interest." Being able to control the output by learning how to work the coding system — a practical skill set with real-world impact — excited her.

In addition to learning how things work, early academic success in STEM-related subjects also supported young women's interest in these fields. Below are some selected quotations from young women expressing that this was a strong factor in their career choice:

I really loved science. I've always been very good at chemistry, like from high school...So, it's my love of the subject that took me in this direction.

- A Zambian lab analyst

So my strengths were in numbers, physics. So, I realized that I would struggle in geography and other art subjects. Then I just looked at what roles would fit me.

- A Kenyan tech innovator

From my primary level, I did science and math very well. When it came to Ordinary Level, arts subjects I would really flunk. So, I think it was a dream come true.

- A Ugandan engineer

For all of these young women, their passion for the subject matter matched a talent in these subjects. For some, their knack for these subjects made them feel that they could "actually do this thing that [they] had interest in," as a young STEM professional said. Several others described STEM careers as the "natural" fit for them, as a Kenyan engineer put it, because they had both interest in and aptitude for the required subjects.

However, it was not just success in these areas that inspired these women. The quotations above show that their success was in contrast to poor performance in other fields, and that this strengthened their preferences. A Ugandan engineer described that at first she had considered doing a business-related profession but that "when it came to [her] performance, [she] was really bad at the arts side." Instead, she said that her "academic performance and the zeal [she] had for the science subjects" led her to consider engineering instead.

For the young women we spoke with, passion was the primary driver for their career choice. Most commonly, this passion was stoked by seeing these fields as spaces where they could use their talents to solve real-world problems. Early academic success in these areas then built their confidence to follow their passions. Initiatives to improve female participation in STEM careers should follow a similar path. They should nurture the curiosity of girls and young women in these fields by showing them how science and math tools can be used practically, and support them to be successful in building their skills from an early age.

Young women we spoke with possess a clear focus and confidence in their visions that helps them manage the opinions of others, as well as setbacks on their journey.

Almost every young woman we spoke with said that she had to deal with the negative views of others towards her interest in a career in STEM — though this was rarely the case with close friends or family. The women expressed, however, that those negative opinions did not stop them. Instead, more regularly, they "did not impact [them] much," as a Malawian IT engineer commented.

A young Ghanaian working in agricultural technologies further explained, "You just ignore them. You don't need to respond to everything…If you know what you are about, you just don't have to respond to everything they say or you hear." In her description, then, her strong sense of self-made others' comments irrelevant.

Other young women expressed that their clear focus helped them deflect any negative opinions. As a Ugandan civil engineer explained, "I am really not like, affected by their words because…I was always ambitious and I knew what I wanted." A Tanzanian electrical engineer echoed this perspective, saying, "Yes! Yes! So many people told me electrical engineering is tough [for women]… But I thank God, I researched a lot, and I knew what I wanted. So, it didn't bother me at all." For both of these women, knowing what they wanted meant that they would not easily conform to what others expected of them. In the case of the latter, having the power of information strengthened her commitment to the career path that she selected.

These traits also helped young women to manage the inevitable challenges that they faced in pursuing their goals. A Tanzanian engineer described her discouragement when she struggled with her university coursework, saying that she questioned whether it was the right field for her. However, she explained that reminding herself of her vision helped her, saying, "It was the vision I had since the beginning, what I wanted to be…So, that was what pushed me eventually…to reach my goals."

You just ignore them. You don't need to respond to everything…If you know what you are about, you just don't have to respond to everything they say or you hear.

She was not alone. A young Ugandan engineer also faced similar challenges when she failed one of her exams and received negative comments from others about her goals. However, she was able to overcome these initial challenges through her confidence in her vision, explaining:

But I said, 'This is not [...] me. I know what I'm looking for!'...People have to say their thoughts, their negative things, but it is [up to] you as an individual to continue with what you want...Some issues I would sit down and be like, 'Don't mind about that. Focus.' Yeah, I used to motivate myself.

For this woman, the most important opinion was her own. When faced with negative stereotypes and with challenges, she found the strength within herself to keep chasing her goals because she was clear about what she wanted.

A Ghanaian web developer had similar ways to motivate herself through the challenges that she faced, saying, "I asked myself, 'Why did you go into this?' So, what I tried doing is to write my reason for going [into this career] in a document. When it comes to a situation like this, I just open that document and then read it to myself to remind myself." Remembering why she chose her field helps her to keep pushing through its challenges.

This was a common theme among the narratives that young women recounted. Their journeys were not without challenges. However, they were able to rise above them because of their determination. For example, when identifying how she managed the difficulty of finding a job in her field, a young Zambian lab analyst simply stated, "it was perseverance." While she said this explicitly, other young women showed this through their ability to weather the challenges that they faced in reaching their goals.

The young women we spoke with had a strong goal-oriented outlook with a clear vision, which supported their determination overcome challenges. Initiatives seeking to support young women in STEM careers should help girls and young women to set strong career goals and build their confidence and resolve to achieve them.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Young women we spoke with were motivated to enter the STEM sector by a desire to challenge expectations of what young women are capable of.

A common theme among the young women was that they did not enter the sector in spite of gender norms. Instead, they did so specifically to challenge them and to push the limits of what others think women are capable of.

When asked what motivated them to choose the careers they did, young women commonly said that they wanted to do something unique. Below are some selected quotations from young women describing their motivations:

By the time I was applying, there were few girls in the industry, and I just wanted to be different from others.

- A Malawian IT engineer

I think growing up I've always wanted to...like, to go into the male-dominated fields.

- A Malawian STEM professional

It was my passion because I wanted to look different from others.

- A Ugandan engineer

I knew from the beginning that I wanted to do something completely unique, something future-proof, something sustainable.

- A Kenyan renewable energy engineer

For these young women, choosing a field that was uncommon among their female peers was important in motivating them to select their careers. They did not want to conform to gender norms, but instead to pursue a career that was different from what was expected.

Other young women also expressed that they specifically wanted a career that others thought they could not do. A Malawian IT engineer explained her motivation to enter the sector, saying, "Because I know this profession is so challenging for a lady. So, I just wanted to be challenged. [There's] that norm that says women should be in social sciences or accounting. So, I just wanted to divert from that and do something challenging." A Ugandan civil engineer had similar motivations, saying, "First of all, because they used to say it was hard for girls. I was wondering why it is hard for us yet guys can do it very easily. I didn't think it was hard." In both these young women's experiences, the very fact that others saw these careers as challenging for women was what led them to pursue them. Both displayed a healthy appetite for taking on challenges — something that their peers also did.

The young women we spoke with wanted to not only challenge themselves, they also wanted to challenge these norms. Explaining what inspired her career choice, a Zambian biomedical technician said, "I've always wanted to do jobs that they say women can't do...So, it's mostly that — just to show them that I can do it as well." For this young woman, her motivation was to prove to others that she could achieve what they did not think she could.

In fact, some women felt their very success in their career alone was powerful enough to change opinions. As a Rwandan statistician said, "There are those who think you will not make it to success. They say that you are thinking beyond your ability. But as they see you succeed, they realize that you are capable." This young woman's statement shows both a high confidence in her own success as well as in her ability to change minds.

This was common among the young women we spoke with, who felt that by being able to perform in these careers they could disprove the negative gender stereotypes they face. A young Tanzanian described her motivation to pursue a career in electrical engineering in the following way:

Of course, sometimes we do things out of pure spite — that I want to prove them wrong, that I am able to do this thing. Also, it is not just proving them wrong. The important thing is just working to the best of your abilities in order to bring something to the table. So, I didn't care what they said.

For this young woman, part of her motivation to pursue a career in engineering was to prove others wrong, while also providing real contributions through her skills and expertise.

Challenging others' preconceptions was a powerful factor in the career choice of several of the young STEM professionals we spoke with. However, their desire to challenge the system was not simply about their personal journey or for their personal benefit. They talked about how they could create a pathway for other young women to expand their career options. As a Rwandan civil engineer explained:

I wanted to explore and see why girls don't follow STEM fields. I think that when male[s] see us (girls) studying only social sciences, they see us as weak people in the mind...It was another way of inspiring young females to pursue STEM, if we are fighting for gender equality. We need to be convinced that girls can succeed in engineering — [that] it is normal.

By pursuing a career in engineering, she felt her success could add to the broader goal of normalizing gender equality. She also stressed that she wanted to act as an inspiration to other young women to join the fight by motivating them to follow in her footsteps.

These young women had a desire to pursue a unique career that could challenge gender expectations. They hoped to use their success to clear pathways for future generations of young women. While these traits came naturally to those we spoke with, we believe they can grow in others. Initiatives seeking to support young women joining STEM fields should not be blind to the gender norms that young women are challenging. They should train and guide them in feminist leadership principles to help them harness their power. They should also encourage them to see the bigger potential of their success and how it can shift norms and expectations for future young women.

For some young women, rejecting gender norms when they were young made them comfortable doing so in their career pursuit.

Several young women we spoke with said that they did not conform to gender norms when they were young, and socialized more often with boys than with girls. They often described themselves as a "tomboy," as a Zambian biomedical technician stated. She explained that, because her friends and family already saw her as a tomboy, she felt that they were more accepting of her career choice since it did not come as a surprise.

Other young women expressed that this childhood experience is what prepared them to enter male-dominated careers. As a Ghanaian UI/UX designer said, "My whole life, I've rolled with boys. So, it's not...it's nothing strange. It's something I've gotten used to." A Kenyan telecom innovator echoed this, saying, "Because I have grown up in a house of boys, I don't really have to fear things. So, being a tomboy helped me get over these feelings." In their experience, growing up with a largely male social circle prepared them for a career with mostly male colleagues — either normalizing that experience, as in the case of the former, or at least making it unintimidating, as with the latter.

Young women mentioned that socializing with boys exposed them to different experiences, supporting their exploration of gender-non-traditional sectors later in life. As a young Ghanaian working in tech explained:

"Maybe this was influenced by my environment when I was growing [up]. I grew up amongst boys. They were always making cars, playing football, and that is what I did growing up...I wasn't playing with girls. I was playing with boys and that informed my choice of what to study in school."

In her experience, socializing mostly with boys meant that she took part in different activities than her female peers, who were exposed to "gender-specific" activities. She felt that that directly influenced her decision to pursue a career in STEM.

Much of this experience and early preference for socializing with boys cannot be replicated. However, initiatives seeking to support young women to enter gender-non-traditional careers should start their support early — targeting girls in their childhood — to normalize similar choices in their youth and adulthood. They should not separate girls but instead include their male counterparts, so that girls are comfortable with challenging gender norms not just within groups of women but also more broadly.

HER SUPPORT SYSTEM

Young women began their narratives by talking about their own motivations, but they were not the only actor in their stories. Instead, there were casts of characters who supported them on their journeys. In fact, this was what they spoke most about, describing the strong support networks that they saw as vital to their success. They found champions in key members of those networks, particularly their parents, romantic partners, and mentors. At the same time, they showed a limited regard for the opinions of those outside of their immediate support network.

Young female STEM professionals mentioned having supportive parents who believed in and encouraged their career choices.

Overwhelmingly, almost every young woman we interviewed referenced their parents as the most supportive people in their lives.

Supportive parents featured strongly in young women's narratives of their success in these fields. For example, a Ghanaian UI/UX designer said of her parents, "They are always supportive of [my] dreams. They feel that you're a human being...who has their own dreams and things. So, they don't really force what they want you to do on you. They want [me] to be on a path that [I] believe is for [me]." In this young woman's case, then, her parents supported her dreams because they recognized her agency to choose for herself.

However, more commonly young women said that their parents believed not just in their agency but also in their abilities. As a Zambian front-end developer explained, "I grew up in an environment where my parents told me that I can do anything I want to do...Yeah, [I] have always thought that, as long as I put my mind to anything, I can do it." A Kenyan tech innovator echoed this, saying, "I would say my mom is because she was like, 'Go for it...If you feel that is what you are strong at, put in your effort and go for it.'...I can tell you my mom is a super supporter." Both of these quotations are examples of a common theme among young women's experience: supportive parents who believed their daughters could achieve what they put their minds to.

In particular, some young women connected this to their parents' positive gender norms. For example, a Kenyan engineer explained, "My parents are supportive. They believe in like, 'women can do anything,' which is really important." Not only do these parents believe their daughter can achieve what they set out to do, they believe the same for women generally.

Beyond supporting their daughters' dreams, several of the young women said that their parents took pride in their career path. Below are some selected quotations illustrating this:

I remember when I was in college, my mom used to compare my course with my friends' career paths, like, 'Look at your friends... studying social sciences, and you, my daughter, are doing IT.' She was so proud of her daughter.

- A Malawian IT engineer

For me, I have amazing parents...They understand me and have been supportive since day one. When I convinced them about my dreams, they took the first step to raise me up...They also feel proud having a female engineer.

- A Rwandan civil engineer

They are proud of me because they believe that I am capable of it. [They know] these things are not the things that can be done by everyone...They are happy of it [sic] because they know that I could achieve something special for me and for my family, and even for my country.

- A Rwandan statistician

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

All of these women felt their parents were proud of their career choices, particularly compared to other more 'gender-normative' options. As in the case of the latter woman, they felt their parents took pride in the difficulty of the courses they have taken.

The young women explained why this support is so important: when they faced challenges and thought about giving up, their parents would motivate them to overcome these barriers. As a Kenyan engineer working in renewable energy said, "Having support from [your] family...sort of helps you push through, even if you feel like you can't." A Zambian lab analyst expanded on this, saying:

My parents have been my push, my anchor, inspired me, encouraged me especially at my lowest times. At times, when I want to quit, at times when I thought I had failed them, they were always in my corner, always had my back.

For both of these young women, and for several like them, having supportive parents helped them to push through the challenges that they faced. They were motivated to rise to those challenges, even when they struggled to believe in themselves, because their parents believed in them.

While not all the young women we interviewed described having supportive parents, there were few who felt that their nuclear families did not support their career choice. However, even for those few, their belief that they were following the right career path for them caused them to ignore those opinions. As a Tanzanian environmental engineer stated, "As for my family, my dad wasn't really excited about it, plus other family members... at sometimes it made me feel that I don't think that they think I'm in the right place. But, anyway, I made a decision. I want it, and as long as I am comfortable, it's okay." This parallels the conversation about how young women's clarity of focus motivated them to manage the challenges that come with pursuing STEM careers.

In fact, in a few instances, this conviction helped convince their parents. A Ghanaian web developer said that, while her parents did not support her career choice at first, "They realized they had no option [except to] leave me to myself. So, that was it, yeah, they just had to accept...that 'Oh, this is the area [where] she wants to be.'" Because they saw that she was committed to her dream of becoming a web developer, her parents later accepted her decision.

This final example shows that parents' opinions can change and that they can become allies in their daughters' pursuits. Young women referred to the support they felt from their parents very often, highlighting how important these figures can be in a young woman's success. Therefore, initiatives designed to support young women in STEM careers should not just target them on their own. Instead, they should focus on a young woman's family as a whole, with a particular aim to include a girl's parents as well. Specifically, these initiatives should try to change parents' gender norms so they can see STEM careers as both accessible for their daughters, and as something that they can take pride in, as a family.

Young women specifically mentioned the role that their fathers have played in their career journeys, often explaining that they wanted to follow in their footsteps.

The young women we spoke with frequently said that they were not the first in their families to explore careers in STEM. Instead, several referred to close family members — often in their immediate family — who had done the same. When asked what inspired her career, a Ugandan engineer working with the Ministry of Works said, "My family. Generally, those guys are scientists — like we have doctors, engineers...Yeah, when I saw their achievements, yeah, I was really inspired by that." Beyond simply having a supportive family, having multiple examples of family members in the same sector inspired this young woman.

When we dug deeper, there was one family member that the women mentioned most often as having a strong, positive impact on their desire for a career in STEM: their fathers. Below are some selected quotations from young women about how their fathers' careers were crucial in their own career choice:

It was my dad who inspired me to join the industry. -

A Malawian IT engineer

[My dad] wanted me to be an engineer from my [sic] young age. He studied mathematics, and he used to call me an engineer from my [sic] young age.

- A Rwandan electrical engineer

Like, my dad did not go far. However, the works he does are all related to engineering. So, that motivated me.

- A Ugandan engineer

Having fathers in the same field was a critical part of the career journeys of all of these young women; they specifically mentioned their fathers' influence on their career paths. These were not isolated cases. Other young women also echoed this.

Some of the women described how their fathers played a key role in their career choice, particularly in dealing with criticism from others who thought their choices were not appropriate. As a young Malawian STEM professional who began working at the same firm as her father said, "The criticism was there, but I didn't care as long as I had the support of my dad." For this young woman, receiving criticism was not important when she could rely on the support of her father, who was working in the same industry.

A Ghanaian civil engineer working on national road projects felt the same, saying, "Already my dad is an engineer...Some were shocked I was getting into the sector, [but] for me, my family...it was normal to them." In this case, having a father working in the same field made that career choice normal in her family, and led them to be supportive where others were not.

Having a father in the sector make it feel more normal to choose that path, and for a few young women it even made them feel more comfortable. As a Malawian surveyor said, "My father is also a quantity surveyor. So, I think in those lines, I was thinking of going into a male-dominated industry. [This] just seemed like a comfort zone because he was also a quantity surveyor." In a sector with intimidatingly few women, pursuing the same sector as her father made this choice feel more secure.

Some of the women described how their fathers played a key role in their career choice, particularly in dealing with criticism from others who thought their choices were not appropriate.

Beyond serving as an example, several young women described how their fathers helped them gain practical exposure to these fields. As a Zambian front-end developer explained, "[My] dad has always been in tech…I was helping him do things on his sites, just small things like content management, and I did not realize that I was doing tech stuff…I think he has been my only inspiration." Helping her father inspired her to seek a similar career, and it also exposed her to the tasks in that career before she had any set ideas about them.

In their descriptions, this early exposure both encouraged young women to enter these fields and also encouraged their fathers to support them in doing so. As a Tanzanian civil engineer recounted:

I was inspired by my dad because he is also an engineer…When we were with him, he took us to the sites, he would pick us up in the afternoon and spend the day at the site. When we were at the sites, I enjoyed playing with the tools, and he saw I was interested. So, he directed me most to study science subjects.

Experiencing her father's work from a young age, this woman developed an enthusiasm for the tools used to do it. Seeing this, her father nudged her to follow the course necessary to follow in his footsteps.

While most young women spoke of their fathers rather than their mothers as being influential in their careers, this was not the case for all young women. A Tanzanian electrical engineer stated that it was her mother who inspired her career choice, saying, "She is an electrical engineer…She is a strong woman and hard working." With such a strong, positive role model, she explained that she wanted to follow in her mother's footsteps.

This was just one lone example, but this is not necessarily a sign of how influential their mothers are in these young women's lives. Instead, it may be more about whether young women have mothers who are in STEM careers whose experience they can draw on.

While it is not possible to reproduce the experience of having a father in the sector, these experiences show just how strong a figure a father can be in a young woman's life. Initiatives to support young women enter the STEM sector should therefore not focus on gender alone and isolate programming to a girl's mother. Instead, such initiatives should help fathers see just how fundamental a role they play in their daughters' lives. For those who are reluctant to support, careful messaging can reinforce that supporting a daughter to choose a career path in STEM is not a challenge to their power but instead an opportunity for them to use it meaningfully.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Beyond providing moral support, parents also acted as gatekeepers, supporting young women to access opportunities in the sector.

Young STEM professionals explained that their parents and close family members did more than just verbally support their chosen careers. Several also said that their parents helped them materially by connecting them with opportunities in the sector. For example, a Ghanaian civil engineer explained how her father helped her get advice on how to join the industry, saying, "My dad is an engineer. I went to see...a lecturer already in the industry through my dad's help. So, we had an interaction, and based on that, I was able to see myself through." Through her father, she was able to get guidance that helped support her training and eventual career.

Others explained how their parents and close family members were key in supporting their access to internship opportunities to build their careers. For example, a Ugandan engineer working as a trainee with the government explained that her uncle supported her to get her current opportunity, saying, "He is a senior civil engineer with the Ministry of Works and Transport. So, he connected me [with this] internship."

Young women who had this experience expressed just how influential this kind of support was early on in their career path. As a Malawian engineer said, "In my first year, my mom helped me to find this attachment...That was my first attachment, practical experience with engineering... With that experience, it changed everything. I was no longer worried." At first, she had struggled with the difficulty of her chosen subject. However, the internship that her mother helped her secure renewed her commitment to pursue engineering.

These experiences show just how meaningful emotional support can be when it is joined by material support, particularly around access to opportunities. They also show that a parent need not be in the sector to provide this support. Instead, they can use their social networks to be mindful of other people that they can link their daughters to for advice and opportunities.

Young women's romantic partners appear to be more influential in their career journey than their friends.

When asked about how their peers reacted to their career choices, successful young women in STEM professions said that they received mixed support from their friends. While some described their friends and peers as supportive, this was not universal across all of their experiences.

Instead, several young women felt that some of their friends were not supportive of the careers that they chose. For example, a Tanzanian engineer explained, "Speaking of friends, there are two groups: those who will encourage you, and others who will discourage you. Sometimes even those you are close with will question your decisions, like, 'You're joining a male's field, will you be able to manage it?'"

Expanding on this, a Ugandan engineer said of her friends that, "The ones that motivated me were very few...Those who did arts used to say sciences are just wasting time. But otherwise, a few encouraged me, and the ones that I found on the way, they were so helpful." In her experience then, she valued those few who supported her far more than those who were critical of her career choice. In fact, this was common among the young women we spoke with: they did not seem to be bothered by criticism from friends, because they placed far more value on the people in their lives who were supportive.

Just as young women felt that success in their chosen careers could change gender norms, so too they felt that their skills in their fields could gain the respect of their friends. A young Rwandan statistician explained how she was able to change her friends' opinions, saying, "[My friends] also doubted and questioned my ability in this area, but…they knew that I was good at mathematics….Even some other friends started loving it for me because they realized that is is very important to me." In her experience, her passion and talent for mathematics encouraged her friends to rethink what they thought was possible.

Even when young women were not able to change their friends' minds, they often did not value their opinions as much as those of others in their social support networks. As a Zambian biomedical technician commented, "My friends? My friends? I haven't really asked them what they thought [laughing]. I don't even think they know what I do." This view is not isolated, but instead is representative of others we spoke with.

It was also clear in their stories that these women's friendships changed over time. Where their friends from their younger years were not supportive, they developed deeper relationships with those that they met in the same field.

Young women did not go into much detail about the role of their friends in their career journeys beyond comments on their mixed opinions about their choices. Instead, the support of their romantic partners — for those who have them — was much more notable in young women's descriptions of their social support. When describing how their romantic partners have reacted to their career choices, the young women we interviewed went into much more detail.

Some young women said that they felt their career made men "fear to date" them, as a Rwandan engineer mentioned. A Ugandan engineer explained why, saying that men told her, "You will disturb me a lot when we start dating or get married, since your career makes you view yourself as a superwoman, but a woman will always be a woman." While she did explain that she faced these negative views while looking for a suitor, this did not hold her back from pursuing her career — just from pursuing relationships with men who have these outlooks.

Instead, for those young women who do have a romantic partner, they almost universally described their partners as supportive. Below are select quotations from young women describing how their romantic partners view their career choices:

Guys understand what engineering is. So, they have no problem.

- A Ugandan engineer

Generally, they don't mind.

- A Ugandan civil engineer

He is very fine about it. He has no doubt concerning my job… Actually he's an engineer as well.

- A Tanzanian civil engineer

He was always happy. He's supportive, yes, but sometimes it's difficult. He worries that I spend too much time at work.

- A Malawian IT engineer

… the support of their romantic partners — for those who have them — was much more notable in young women's descriptions of their social support.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

In these young women's experiences, romantic partners have been generally understanding of the demands of their fields, particularly when they are in the same career. The only concern they found their partners to have is about how busy they can be at times.

A Rwandan mathematician expanded on this, saying of her partner:

He thought that in this domain, we are always studying, we are always with notebooks…He was wondering if he will be able to find me whenever he needed me. But as I progressed in it, and when he needed me, I could be available, he realized that I could manage to study hard and also find time for him, without failing the other side.

The young woman's ability to juggle both her personal and professional life convinced her partner that she could be supportive while having a demanding career. Whether she felt that her partner could demand her time or not, she felt empowered to manage both parts of her life.

Despite this concern about time demands, young women said that their partners valued the positive aspects of dating a woman in this sector. A Rwandan engineer described her boyfriend's opinions, saying, "My partner says that it is hard to marry an engineer because they are busy. But, on the other hand, he told me that women engineers are strong and powerful." Despite his concerns, this young woman's partner also held a positive opinion about the type of women who become engineers, placing value on her power.

A Tanzanian environmental engineer echoed this, saying of her partner, "He likes making this joke, like for instance, if we get married, they will be calling our home 'the home of an engineer.'" While they laughed about this, she also said that this showed that her partner took a certain pride in the status of her career, paralleling the view several young women had of their parents.

Beyond simply being supportive, several young women described their romantic partners as central to their success. For example, a Malawian engineer said that her partner "was actually the one who inspired [me] most." A Zambian biochemist echoed this feeling, commenting, "He actually supported me… encouraging me to do a degree." In her case, her partner also pushed her towards growing her career.

Apart from helping them to grow, other women said that their partners showed their support through more everyday things such as allowing them to travel and taking on more household responsibilities. Below are quotations from young women expressing how their partners have been supportive. We have intentionally kept these quotations long to retain these women's voices:

People always say women are meant to be at home, but my husband has encouraged me, pushed me in my job…I can go for two weeks, and he'll be there at home alone. He won't say, 'No, I'm hungry. Come and clean. Who's going to cook for me?' He's always in my corner, always pushing me and wanting the best for me.

- A Zambian lab analyst

There are times we would be preparing for board meetings, and it is one am. I had a small baby at the time. And then, one of the things that even us, like ladies, we have to do, you have to surround yourself with a great supportive system. I am lucky to have a supporting husband, [who ensures] the house is organized. So, because of that system, I am able to stay in the office until I finish the work.

- A Kenyan telecom innovator

I balance. I try to make time for my family and work…I travel a lot…I can stay three weeks outside of the home, and that's when it becomes challenging. But my husband is understanding. There's no issue whatsoever. Like for example, there was this study by the World Bank… where more women were dropping off in STEM careers just to please their romantic partners…But I think now things are changing. People now understand that women can also work away from home, and that's okay…I go home to a very supporting family.

- A Malawian road engineer

All of these women, and others, spoke of how their husbands have supported their careers. They understand the demands on their time and what that means for the time and energy they can give to domestic tasks. By taking on more household responsibilities, these women's partners support their needs so that they have the space to grow their careers. With supportive partners, these women feel that they can juggle the competing demands of their careers and families. In particular, the young Malawian woman said that she felt that this was not unique to her experience, but instead part of a broader cultural change around women's roles.

If the experience of these young women is similar to others, then this clearly suggests what type of cultural change is needed and for whom. Support from romantic partners matters so much more to these young women than that of their friends. So initiatives that only target girls and young women, or that only focus on changing views about what women are capable of, are not enough. Instead, such initiatives should also target their male counterparts. They should help them see their role in relationships differently, so that these roles include more household responsibilities that support young women in their careers. Such initiatives should also work on fostering a sense of pride — not fear — in young men partnering with such strong and powerful women as those in the STEM sector.

Mentors play a critical role in young women's pursuit of, and advancement in, STEM careers.

Peer mentors and female mentors who can act as relatable and empathetic role models are particularly meaningful to them. Despite some differences in their career paths, there was one area where young women had an almost universal experience: a mentor played a central role in her journey. These were the figures who came up most often in their stories and whose influence they talked most about. They were individuals young women could name, and they had a specific impact on their lives and careers.

Young women regularly talked about just how crucial mentors have been in their career. Even those few who did not have a mentor mentioned how much more helpful it would have been to have one. For example, for a Malawian engineer, it took her some time to feel confident in the sector. She said, "I think it's because I didn't have a mentor. These courses are seen as male-dominated. So, at the time I didn't have a mentor who I looked up to." While she was one of the exceptions among our sample, she still saw the value of a mentor as much as her peers did, particularly in how they could have helped her see the possibility for success in a sector with few women.

In their narratives, young women's mentors play diverse roles in their career journeys. However, across their experiences, there are some core types of support that their mentors have given them.

A common theme among young women was that their mentors give them practical career advice. As a Rwandan engineer explained, "I was inspired by her hard work and dedication. We meet once a month and plan short- and long-term goals. She is very helpful, and she is very knowledgeable in this field." This example is similar to that of other young women, who felt that their mentors not only gave them advice to handle specific problems, but also helped them plan ahead in their careers.

Beyond advice, young women often spoke of mentors who helped them improve their skills. For example, a Rwandan statistician described how her mentor — her sister — encouraged her career journey by helping her build her skill base, saying "She encouraged me to love [statistics] so much...there were skills that she had. She taught me. She explained some for me." This was a common theme: the people in young women's social networks made these seemingly-complicated fields easier to understand, encouraging them to pursue careers there.

In particular, young women talked of how important practical exposure to skills from mentors was. Speaking of a female plumber working at her dad's sites, a Tanzanian woman said, "Most of the times [sic], she called me to do stuff. So, I got very close to her." Similarly, a Zambian biomedical technician spoke of a male mentor, saying, "He'll take me along with him as he's working to teach me how things work. So, since mostly I only have like the theory part...he helped me get the practical part." This practical exposure has inspired them as well as given them more direct experience in the sector.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Young women who had mentors in the companies that they worked in spoke of feeling included in strategic workplace conversations to share their ideas and leadership. Below are two such powerful examples, which we have intentionally left in their full detail:

He's older, he's 60-something, but he is very feminist and very pro-women...So, he is the type of person who prefers to sit back, listen, guide, and support, rather than saying, 'This is my way. You must do it the way I know because I have been in the industry for 30 years.'...So, in that space, I never feel like I have to defend my ideas. In fact in any case, he will always come and ask my opinion on something, especially if it is more technical...You know, he's the type of person who will teach you what he knows, and he will learn from you.

- A Kenyan engineer

I was the only female... definitely looked young enough to be their daughter. So I remember telling one of my mentors that I was not sure if I could present. So, I told him, 'You do it, and if there is anything to add, then I will.' Then he said, 'You do it. You are the one who has been running the project, and if you need any help, I am here and will be able to support.'...The meeting actually went on very well, and there was no need for him to step in...In fact, one of the outputs was [the need] to transfer this culture of young women being involved in conversations...He knew my capabilities. He knew my aspiration. Hence, he was able to push me...By the way, my mentor, he has daughters. So, he gets it.

- A Kenyan telecom innovator

Both of these young women found their mentors' approaches to be useful in building their careers, but also to be inspiring.

There is a lot to unpack in both of these narratives; however, we will discuss a few key points. In both of these young women's experiences, their mentors are older men in the sector who have used their power to create space for these young women's contributions. In the case of the latter, seeing the positive aspects of this even encouraged their client to think about changing their own workplace culture. Both of these young women attribute their mentors' support to the value they place on women — either because their mentor is a feminist, in the case of the former, or has daughters, in the case of the latter.

Both of these young women found their mentors' approaches to be useful in building their careers, but also to be inspiring. This is the final area that young women spoke about in regard to their mentors: how they motivate them to overcome obstacles. For example, a young Ghanaian woman in STEM said, "When you hit a point you think is a breaking point, you tend to lean on [your mentors], especially when they have the experience or they are older and more exposed." A Ugandan engineer echoed this, explaining of her mentor, "Of course, these works are not easy. When you feel like giving up, he would sit you down and say, 'You have to do this.' He would encourage." This was a common theme among young women we spoke with: their mentors were a key source of emotional support in difficult moments, boosting their morale and encouraging them to push through.

These young women's mentors were diverse; both women and men, both peers and older professionals more established in their field. A Tanzanian electrical engineer explained how she has brought different mentors together to support her in different ways:

I have two mentors. One is a bit aged, but he is more experienced and professional. The other one is still a youth. So, the first one, who is more experienced advises me and guides me...the other one helps me to maneuver around like how to negotiate when it comes to payments and different changes in the industry, since he is well updated.

For this young woman, her mentors play different roles based on where their experience makes them better able to support her. She trusts the ability of her more advanced mentor to advise her on the right path to take, and she trusts the relevance of her young mentor's support because his experience is more current.

Her experience shows that even mentors who are not yet as established in their fields can also have a specific value. The experience of other young women we spoke with echoed this. Often, they mentioned looking up to peer mentors from within their social circle or their educational environments.

For example, a Ghanaian UI/UX developer explained how her friends helped push her to explore opportunities in this sector, saying, "I had friends who were at level 100. They could program applications and things. So, those were people I used to look up to. Because of them, I started learning how to develop." These friends also helped her get practically familiar with the field by teaching her what they knew.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Young women often mentioned how inspiring young women just a few steps ahead of them in their education were. Below are some selected examples from young women commenting on how important these peer mentors have been to them:

There was someone — this older girl who was two years ahead of me [in school]...She was just like a mentor. I just wanted to be like her.

- A Malawian road engineer

They used to come and talk to us, and they shared different tips on how you can keep growing in a male-dominated field. I would say they contributed a lot to my journey in engineering because they helped me overcome most of my fears. They have helped me normalize engineering.

- A Rwandan civil engineer

When I was in my secondary school, I saw a lady at my school...She won first place in a STEM competition, and she went to study at Harvard University. After seeing her, I was motivated to work hard and become like her in the future. She was fearless and strong.

- A Rwandan electrical engineer

Their experience suggests that useful mentors don't have to be well seasoned in the industry to provide support. Even peer mentors a couple of steps along in their career can act as useful role models because they are accessible and relatable. These role models have been particularly useful in young women's STEM education journeys.

While young women's stories show that the role mentors play is perhaps more meaningful than who they are, female mentors do have a specific value. As a Zambian front-end developer stressed:

People don't realize that having more and more role models would make all of this easier. Just looking through the history of television, every character that was cool that I have ever grown up with was male. I have known male scientists, male technicians, male everything.

This young woman could see how popular media support the idea that STEM is a male-dominated sector by showing mostly male characters in STEM roles. She expanded on this to state that people "underestimate" the specific value of having female mentors and role models to look up to.

Other young women also explained why it is important for young women in STEM to have female mentors. For example, a Rwandan electrical engineer said, "Female mentors are important. They understand our struggles, and they empathetically inspire us to become better, based on their personal experiences." A Rwandan civil engineer echoed this, saying, "Female mentors in the field help more. They know all the challenges we go through because they have experienced them as well." For both of these young women, female mentors are more valuable because their shared experience of being in a male-dominated field allows them to be more empathetic.

Young women also explained that their female mentors are better placed to teach them strategies they can use to be heard in the workplace. A Kenyan renewable energy engineer described how her mentor taught her to use her power, saying, "She taught me a lot about quiet power...There's certain ways that you can negotiate; there are certain ways that you can even choose your battles to get what you really want done. And even use psychology and other creative means." Based on her own experience, this mentor suggested ways for this young woman to manage gender-based workplace politics.

In addition to these traits, a Tanzanian electrical engineer explained how connecting with other women in the sector can act as a spark for broader social change, saying of her mentor, "She encourages me a lot to not be comfortable and satisfied with where I am now and what I have. I should aspire more and not just have a mentality of being employed, but I have to bring about changes in my society." Her mentor both pushes her for her personal success but also inspires her to support broader changes that can help other young women. This theme of women creating a path for other young women to succeed was common throughout our interviews.

Given how critical mentors are to young women's career journeys, above all, initiatives seeking to enhance female participation in the STEM sector should focus on matching young women with mentors in the field. Young women could benefit from being connected to both peer mentors and older women more established in the field, since both have their own value as explained above. Apart from simply giving career advice, these mentors should play an active role in young women's lives, supporting them to plan their career paths, build their skills, and apply their skills practically. When they are drawn from the same workplace as young women, they should also create spaces and platforms for them to share their ideas.

HER LANDSCAPE

A young woman does not pursue her career goals in a vacuum. Instead she does so in a complex landscape that is the background for her entire career. Young women explained the limiting and enabling factors that they faced in their journeys. They described how they managed relationships with educators, employers, and co-workers. Generally speaking, they found differences in how welcoming these groups were of their contributions to the sector. They found educators to be mostly supportive. Employers were at times hesitant but overall gave them a chance to prove themselves. Co-workers presented the biggest challenge, doubting their abilities on a daily basis. However, despite barriers, they weathered these challenges, drawing on the personal strength and positive self-image that they started their journeys with.

The young women we spoke with only faced a few challenges in seeking training, but had more mixed experiences when looking for employment.

As young women seek the skills needed to pursue STEM careers, their education journeys are not without barriers. As a Rwandan electrical engineer said, in her experience, her training "institution doesn't trust female candidates. We most of the time go extra miles to prove what we can do, unlike our male counterparts." However, such experiences were rare in our sample.

Instead, for the most part, the young women we spoke with experienced few barriers in building their STEM skills. For example, a Ugandan trainee engineer said of her training environment, "I think I wasn't treated any differently." Another young Ugandan civil engineer echoed this, saying, "There are the challenges that every student faces. Of course, we [girls] were very few. We were 21 out of around 140...but I guess we were looked at as normal students, same as the boys." While there were more boys than girls in her classes, she did not think this impacted which obstacles she faced, which she saw as being the same for all students.

Several young women described how their institutions focused far more on a candidate's performance than on their gender. As a Malawian road engineer said, "[Entrance] was based on merit. One was not favoured because of their gender; the way one performed reflected on their grades." Young women saw this as the professionalism of the institutions. As a Tanzanian civil engineer said, "To be honest, they supported me I think because they are professionals." A young Zambian biomedical technician put it more bluntly saying, "the school only cares about money," not someone's gender.

More often young women stressed that, in their experience, women were actually encouraged to enter STEM courses. Below are some selected quotations from young women expressing that this was the case for them:

They were actually encouraging women to go into such courses.

- A Tanzanian environmental engineer

During our time, we were 10 girls in our class. So, it was like the first class with a lot of girls...So, actually, the institution was supporting us, 'You know you can do it. If you made it to come here, then you can do it.'

- A Malawian engineer

They're encouraging like the females to take up engineering. So, they actually...I would say they treated us...a bit better than [the boys].

- A Zambian biomedical technician

The majority in the class was boys. If we were 92 students, 70 were boys. If they could find a girl applying for those trainings, they are very happy with you, and even when they are teaching, they put much focus on you.

- A Rwandan statistician

These are just a few selected voices. However, such perspectives were common among the young women we spoke with. They felt that because young women still do not often pursue STEM careers, educators and administrators in training institutions encouraged those who did express interest in doing so.

The last quotation above also illustrates another common experience: not only did young women find that their entry into training programs was encouraged, but also that they received equal — if not slightly better — support throughout their training.

Several young women mentioned that they were able to secure help and support when they needed it. For example, a Ugandan engineer commented, "Everywhere I would go [in the university]…I would just get the help I needed." A Kenyan telecom innovator expanded on this, saying:

When I would approach the lecturers on the side to explain something to me or anything, they are very open and supportive. There was not really that feeling that you are female…you wouldn't understand this. So, when I took the initiative myself to have those conversations on the side, I realized that there was a lot more support. Sometimes, we are the ones who create the barriers ourselves.

Both of these young women felt that those in their university would support them when they needed help. The only caveat to this, in the experience of the second woman, was that young women could be too shy to ask for it, and might feel that their lecturers hold more negative viewpoints than they actually do.

In fact, if anything, more commonly, young women described their female lecturers and trainers as particularly "supportive and encouraging," as a Ugandan civil engineer mentioned. Talking of her trainer, a Kenyan web developer said, "She used to encourage me like, 'You know what, boys and girls have the same brain. Don't be lied [to].'" A Malawian road engineer explained why their female educators are so supportive of their career journeys, saying, "We had female lecturers who were encouraging us, 'Work hard. You can also do it. Much as people were saying this was a male-dominated field, but even us, we were like you.'" For these female educators, seeing themselves in their female students made them more supportive and encouraging of their ability to achieve in a male-dominated sector.

This does not mean that the young women we spoke with did not have any negative experiences when building their skillsets. They did — just less commonly. However, even in these instances, they often described how aspects of their personality, as discussed in the first section, helped them manage these challenges.

In particular, young women were not intimidated by the gender disparity in their classes because "that's something you know from the start, that is what you knew you were getting into," as a Kenyan mechanical engineer said. Instead, a Ghanaian civil engineer stressed that she instead focused on her goals, saying "We were about 29 [girls], and the guys were about 190-something…But, for me, [it was just] do what you came to do, and that's it." Maintaining their goal-oriented mindset supported these women in these male-dominated environments.

Additionally, some young women mentioned how they used this gender disparity to their advantage. For example, a Kenyan renewable energy engineer explained:

I realized that because I'm Black and a woman, it made me stand out. So, instead of feeling bad and hiding, I was like, that's perfect because it makes me stand out. So, I would make sure that the lecturers remember me… The more they know you, and the more they are able to remember you, it becomes easier for you. So, using discrimination as positive discrimination.

Her example shows the power of her agency. She could remake what made her different into an advantage — a clever and resilient strategy.

While young women faced only isolated challenges with educators and trainers, more often, they faced challenges from their male counterparts.

Speaking of facing negative views in their training environments, young women said that this came "not particularly [from] the training personnel but the people you meet there that are also in the training - males," as a Tanzanian environmental engineer stated. They explained that their male peers questioned their capacity to succeed in these careers. As a Rwandan software engineer stated, "The boys said that girls are dull, and they do not know anything on [sic] IT." Another young STEM professional explained:

"Even at A-level, I studied co-education. So, you find the ratio of boys to girls is low. So boys were like, 'So you are feminists.' Even at university, it was the same. They were taking us girls as weak links and were asking, 'Will you surely manage this struggle?'"

Yet these views did not deter these young women from pursuing their goals. Young women placed less importance on the opinions of their peers than on those of the educators that they looked up to.

Neither was this experience universal. Instead, some young women described being educated in very supportive environments. For example, as a young Malawian surveyor explained:

"I don't know about other courses, about other people, but with our class it was very special. We were all close, and most of the things we were doing together. So, it didn't matter who was helping [whom] or who was doing what. We were just together as one team...and they didn't care that 'these are ladies' or whatever."

This young woman expressed that her classmates came together to support each other irrespective of gender. This suggests that a more positive experience is possible, but only if initiatives to support young women in STEM target their male counterparts, too.

When it comes to getting recruited for employment, young women have had more varied experiences. Several young women did mention that they felt some employers were still looking specifically for men. For example, a Rwandan software engineer described an interview that she had as follows, "When he [the recruiter] saw a certain male they had been looking for, he assured us that that male would go through, and I had to just quit the interview because they already had bias, and indeed he went through."

However, not only were these experiences isolated in the sample, they were also isolated in young women's lives. As a Malawian IT engineer said, "As I was doing an internship at my previous workplace, there was a vacancy in the IT department. They didn't even consider me because they wanted to hire a male. That's the only time I experienced something like that." While she faced limits in her employment search because of her gender, it was only in this one instance in her life.

Some young women described that, while they were able to succeed in the job market, they first had to prove their ability to employers. For example as a Malawian engineer explained, "I can say I was a trial, like, 'Let's try and see how ladies can perform.' And actually, I think I did well; that's why they recruited me." While she was able to retain the job based on her performance, her employer did have doubts at first about her capacity because of her gender.

A Kenyan web developer commented further on employers' expectations, saying:

Most of the tech companies, when you ask for interviews or job vacancies, they always consider or always think it is a man who is going to apply; it's a guy who is going to win the job...But thanks God...they are appreciating women in technology these days.

While she felt that employers still expect that a man might be the right fit, she did mention that she is seeing a cultural change, with increasing value being placed on women's abilities in these fields.

This is something several women also mentioned experiencing in their own job hunt — that their gender was not something that they felt influenced the recruitment process. Describing her own recruitment, a Rwandan mathematician explained, "My employment was very fair and sincere. We did exams... Some were selected for interview [sic], and I was among them. I was the first in score, that is how I was employed...There were no particular challenges that I have faced because I am a girl." In her experience, she felt that her recruitment process was based on performance and was therefore gender-blind.

Several of her peers echoed this feeling. For example, a Ugandan engineer explained of her own experience, "You are treated the same way. Once you show them what you can do, they get interested." A Rwandan electrical engineer agreed, saying, "What excites the employers is your competence as a candidate. Your gender doesn't really matter much." In both of their experiences, employers value a candidate's abilities over their gender.

Young women we spoke with did not just view recruitment processes to be fair when they were successful in getting a job. They also did not feel their disappointments were because of their gender. Young women who mentioned applying for roles where they did not receive interviews regularly said that they did not think this was because they were women.

Some young women we spoke with instead felt the opposite: that being a woman was what helped them in the recruitment process. As a Ugandan civil engineer commented, "They were looking for female engineers in particular. So, my chances were much higher." A Zambian biomedical engineer similarly stated, "They actually said they would like a female...Yeah, a female technician...like they wanted to balance it up." In particular, for the latter, being a young woman was an advantage in the recruitment process because she could add diversity to a male-dominated work environment.

This advantage of bringing gender balance to a team was something that other young women remarked on. However, for some, this felt like a bit of a hollow reason for being recruited. Some young women in Rwanda saw laws that mandate companies to have a certain percentage of gender representation to be an example of being hired for reasons other than their ability. A Tanzanian engineer felt similarly, saying, "I was the only woman. Somehow, I felt they picked me just to fill the gap. There was no woman before...Possibly I did well, but somehow I feel like they just wanted to balance the gender, but it's an advantage." While she felt that something other than competency led to her employment, this young woman did still see this as something that she could benefit from.

Young women appear to have the right support that they need to succeed in their learning environments, particularly from female educators. However, they had more mixed experiences when seeking employment in the sector. While some felt that employers still prefer male employees, others felt that recruitment processes valued their performance and competence — and, at times, their gender as well. As such, with limited resources, initiatives supporting young women in STEM should focus on supporting employers to see the benefits of hiring female employees.

Some young women we spoke with instead felt the opposite: that being a woman was what helped them in the recruitment process.

Once in the workforce, young female STEM professionals struggle to prove their competence on a daily basis to their colleagues and their clients.

However, they have adopted strategies to manage these challenges for now. They have hope that these issues will reduce in the future as more young women enter the sector.

Some young women said that they faced few gender-related challenges in the workplace. For example, a Rwandan mathematician mentioned, "In our institution, we are like equal. They [men] are like three more than we are. So, that inequality is not as much as that one at school." In her experience, working in an environment with a better gender balance meant that she experienced fewer gender-based challenges. However, her experience was not common among those we spoke with.

Young women we interviewed said that they did not often face many gender-based challenges with workplace safety or work-life balance. Instead, what they often struggled with was the need to prove themselves as women in STEM on a daily basis. As a Ugandan engineer stressed, "You have to struggle [to] show them you're competent enough...you just really have to prove your point."

They regularly explained that, until they were able to show their competency through their performance, they were regularly doubted by their male colleagues. As a Ghanaian web developer said, "People sometimes think you're not capable of the job...They doubt my competence...You have to work harder to prove yourself. I like the work [I] am doing; [I] am passionate about what I am doing. I'm industrious enough. So, my results speak for itself [sic]." While she believes her results show her ability, she explained that others often do not believe it until she is able to demonstrate it.

A Ugandan trainee engineer echoed this, saying of a more senior male colleague, "The first time he saw me, he said, 'Can you even put on safety shoes?' Then, I told him yes... Afterwards, he gave me his work and I did it very well. Then he started saying, 'This girl looks lazy, but she can do something.'" Once she was able to demonstrate her skills, she was able to disprove his initial doubt.

However, young women described that such opportunities are not easy to come by. Instead, they often had to fight for them. As a Tanzanian environmental engineer explained, "Sometimes the male supervisors are not willing to take you to site because they think you are a woman and take you as vulnerable. So you actually have to fight for them to take you to site. Yeah, sometimes you have to go the extra mile like prove it to them that you can do it." In her experience, she had to seek opportunities to show her competence and disprove gender stereotypes about her ability to deliver her work.

This complaint was common among young women we spoke with: that merely doing their jobs well was not enough to dispel stereotypes. Instead, they had to go over and above to do so. As a Malawian road engineer said, "We have to work beyond our limit, just to prove that women can do it...Every day, we have to put in extra work." A Rwandan statistician echoed this, saying, "Even your workmates doubt your ability and performance as a girl. [They] wonder whether you will manage to use all the software used. They even ask you what are irrelevant questions to your work just to try your skills and knowledge." In the case of the latter, her male colleagues felt entitled to test her just to make her prove herself.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

Young women said that these challenges were most obvious at key moments in their career, like when starting out in the sector or when trying to take their leadership to the next level. A Malawian surveyor commented on the former, saying, "It's just difficult when you are coming in. That's when everyone will doubt you. Unlike for a man, they will just be like 'whatever' about what he says and accept him. But for a lady, you need to prove yourself." She saw the need to prove yourself as a woman as a particular challenge for those taking the first step to build their career because they first need the chance to do so.

In a similar way, a Rwandan electrical engineer felt that it is particularly difficult to gain leadership roles as a woman, given gender stereotypes, saying, "This is our daily struggle. We always prove our ability because of the perceptions people have about females in STEM, and it makes me sad. It is even hard to lead a big project in engineering." In her experience, leadership opportunities were most commonly given to her male colleagues.

Even those young women who had leadership roles stressed that they found it difficult to get their male colleagues to respect their authority. As a Rwandan civil engineer said, "Women struggle to supervise the work of teams made of only male[s], but as an engineer, you have to show them what you can do." A Tanzanian electrical engineer expanded on this, saying, "When you're a group leader and you give instructions of what's supposed to be done or the time to meet, a man will be like, 'You can't command me the time to report. I will come when I want.' I think it's because you're a woman." Both of these young women expressed that it can be difficult for young women in STEM to lead teams with a lot of male colleagues, as they often question their authority.

More often, they mentioned that their male colleagues — even those who were more junior — tried to exert their authority over them. For example, as a Zambian biomedical technician commented of a colleague, "He's a bully who likes to play boss…He's like, he's the guy [and] I'm female. So, any secretarial work, he gives me, which isn't even my job."

Several young women said that these were challenges that they did not just face with their colleagues, but also with clients. As a Kenyan mechanical engineer said of interacting with clients:

I feel that I have to prove myself every time. Because when I'm assigned to a site, clients go, 'You are the one who has come today?' I think they were expecting a massive man or something like that…You have to really show them…[because] they've already judged you.

In her experience, the same challenges that young women face with their male counterparts also come up with clients. They have to show competency to dispel the judgements first made about them. However, her statement also shows just how challenging this can be because it happens every time with each new client. There are no gains to be had from already having proved her abilities through the last task she did. She was not alone; other young women also mentioned this frustration.

For every one woman who had positive experiences with supportive male bosses and other colleagues, there were several more who said that the challenges they faced in proving themselves led them to doubt themselves. As a Tanzanian engineer said, "You know, I work with different people, and most of them are men. So, some of them can mess with your confidence, and [you] get that feeling like, 'Am I really in the right place?'" Because others doubted her capacity, she began to question it herself.

This is our daily struggle. We always prove our ability because of the perceptions people have about females in STEM, and it makes me sad. It is even hard to lead a big project in engineering.

CAPTION LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT.

However, more often, young women in STEM showed their strength through strategies that they use to respond to these stereotypes. They often draw on the same personal traits that supported their entrance into the sector.

Often, young women we spoke with explained that they had learned to cope with and adapt to these challenges. As a Rwandan mathematician commented, "You know that every work has challenges and motivations. All you do is know who you work with and how to manage living with them." A Ghanaian UI/UX designer showed a similar acceptance of these challenges, stating, "You'd face it anywhere, but they are not like very major challenges. There are some small stereotypes...that they're like, 'Okay, so if you're a girl, you are not supposed to do this.'...Even that one, we are able to address it, and then we work through issues." In both of these cases, these young women downplayed the difficulty of proving their ability by explaining that they accepted — and learned to manage — these issues.

One of the ways that young women managed these issues was by using the same confidence and determination that brought them into the sector in the first place. For example, as a Tanzanian engineer stated, "To be honest, it does not affect me in any way because I trust myself that I can do what I am doing." A Malawian engineer similarly stated that weathering these frustrations comes down to a young woman's self-confidence, saying, "It depends on you as an individual — how much confidence you have — because once you start doubting yourself, you start thinking of yourself as not worthy of the job." For both of these young women, confidence in their ability is what supports them to both lessen the impact of others' opinions, and to not internalize them.

Young women spoke of drawing on the same confidence to challenge how their coworkers respond to them. As a Ugandan engineer said, "These people tend to undermine us. So, they have to listen to us because sometimes they may be wrong, but they do not want to listen... Of course, you have to show at least your energy and your power."

Beyond drawing on their confidence, some young women described a unique motivation in responding to this challenge. A Kenyan web developer explained how the need to prove her competency pushed her to success, saying, "Here, you get yourself into a room, and you find all of them are men, and you are the only chick. So, it's a bit intimidating, but at the same time, it's a strength stepping stone for me because I encourage myself each and every day." A Malawian engineer expanded on this, stating, "It's more motivating than an environment with a lot of women. We have more males here, you know...You see your colleagues meeting their targets, and you just end up working hard to match those energies." Both of these women found that the competition they faced only pushed them to work harder and achieve more.

Others responded in a different way by identifying a unique niche that others could not compete with. As a Kenyan renewable energy expert explained:

I did feel like I had to prove myself and prove my technical capability, prove the fact that I am a woman and I am young...And then I suddenly realized that the more I specialize my expertise...the more people have to listen to me because there are not many experts in this...So, I end up earning respect.

For this young woman, then, investing in a specialization helped her assert her competency in an area that few could challenge.

While these gender-based stereotypes and microaggressions in the workplace are still common among those we spoke with, these young women had faith that these issues are changing as more young women enter the sector. As a Rwandan civil engineer explained, "You have to prove [yourself to] them, but when you prove [to] them that you can deliver, they start trusting you, and they give you opportunities. Behaviour change takes time…but nowadays things are changing." In her experience, the opinions of individual coworkers can change once you have shown your competency, but also she saw that in general opinions are changing about what women are capable of in STEM.

Another Rwandan engineer said that this change has coincided with an increase in the number of young women entering the sector, saying, "We used to meet with other male experienced engineers, and they were very surprised to see us joining them on the field… But later, the number of girls kept increasing, and they have seen our performance. And now their perspective on girls in STEM is changing gradually." With more women entering the sector and showing their ability, the male engineers that this woman interacts with have become more aware of their potential.

A Kenyan engineer related the changes that she has seen in coworkers and employers to broader changes in how men view their female counterparts, saying, "Men, a lot of them [have] become champions for women…There are some male champions who are strong feminists and believe that women should be able to use their power, as they help you achieve your goal." In her perspective, men are changing their views of women more broadly and are becoming feminists. Because of this, they are more willing to give them space to assert themselves, and they see the benefit in doing so. Such experiences give her, and others, hope that while young women do still struggle, this is changing.

While having a mentor appeared to be the single biggest enabling factor in the STEM career journeys of young women we spoke with, having to prove their competence on a daily basis seemed to be the single biggest challenge they faced. The young women we spoke with had developed different strategies to respond to this challenge, but they should not have to. This highlights that initiatives seeking to support young women in STEM should not see securing employment as the endpoint in this journey. Instead they should also help young women to grow their careers and their leadership by supporting changes in their workplace culture. In particular, initiatives should focus on working with teams to create more space for young women's contributions, especially by addressing the negative gender stereotypes that their male coworkers hold.

While young women felt that their work environments were generally safe, they did regularly mention that they faced sexual harassment in their male-dominated workplaces.

The young women we spoke with mentioned that they feel generally safe with their work conditions and the policies and procedures that their employers have put in place. They do not feel similarly safe from their male colleagues. Instead, they said that sexual harassment is common in the male-dominated fields that they work in.

Young women described that this sexual harassment came in many forms, from casual but unwanted attempts to flirt with them, to direct sexual advances. As a young Malawian IT engineer said, "Sometimes it can be so uncomfortable because there are a lot of men here… Sometimes they hit on me, probably because I'm new here…They want to try their luck maybe." Whereas a Ugandan engineer described the more direct sexual advances she dealt with, saying, "Your bosses undermine you, underlook you just because you are a lady. Sometimes, some of them want to take advantage just because you are a lady…like, let me say first sleep with them and they do something for you in return."

Some young women had a rather defeatist view of this sexual harassment, seeing it as something that they could not avoid, both in the STEM sector specifically and in most workplaces generally. As a young Tanzanian engineer said, "Some say it's the way you dress, but I don't see that as a reason. I just see that men, even if you fully cover your body, if he already desires you, you won't stop it. Those challenges are…in most workplaces." In her experience, this was unavoidable because there was little she felt she could do to counteract it, either in her current workplace or any other that she could move to.

While sexual harassment often came up in our interviews with young women, they also were often hesitant to go into more detail about their views and — more significantly — their experiences. This suggests that, when working on building an inclusive workplace culture, we cannot focus only on addressing negative perceptions of young women's capacity. We must also start an honest conversation about the sexual harassment that young women face from their colleagues in these male-dominated environments.

SPOTLIGHT: POWERFUL VOICES FROM VIRTUAL MENTORS

Unlike most research reports, where suggestions come mostly from the research team, we have a unique opportunity to share the recommendations of young women in STEM themselves. For young women who do not yet have mentors, we consider these voices to act as virtual mentors, guiding them on how to best position themselves in the sector. We have intentionally kept our interpretation light in this section to allow these 'virtual mentors' to speak directly to the next generation of young women in STEM. When we asked them what advice they had, here's what they had to say:

Follow your passion, not what people tell you to do.

A Zambian biomedical technician:

"Do what you want, pursue it."

A Malawian IT engineer:

"I would tell them to follow their hearts. Don't let anyone tell you otherwise."

A Rwandan software engineer:

"Everyone should do something they love. They should make their own choices, not what parents tell them to do...You can see someone who loves playing with computer things from childhood. You just need to go in and study what you love."

A Rwandan electrical engineer:

"The important thing is to find the intersection of what they are passionate about, their skills, and the vision they have for the future. If they love STEM, I encourage them to follow it...You gain respect from the community, and they trust you because you have followed what others call the hard things. People say that if you excel in STEM, you can excel in almost everything. It sounds radical, but I agree with the statement."

Be strong and determined, focusing on your goals above all else.

A Ugandan engineer:

"Be strong. Be bold...because I think you have to prove yourself everyday."

A Ugandan civil engineer:

"They should always be assertive. Like, they should know what they want...They should be like...um...be arrogant a bit. Like, they should know what they want...They should not take anyone's life above their own life."

A Ghanaian web developer:

"Don't let [anything] discourage you. You can do it. Keep your focus. Be determined, and put in your effort. You can do it!"

A Kenyan mechanical engineer:

"As much as with STEM we have challenges and all, there is that fulfillment. You are happy. You know, 'This is what I want to do with my life.' So, I encourage them. Despite the challenges, I don't think someone should change their dream or change their ambitions."

A Malawian surveyor:

"At the end of the day, each and every course needs you to work hard. You need to be determined to do whatever it is.... You need to put your heart into it...It's not only males that can do it; young girls can do it."

Value your potential, as a woman, and take pride in tackling gender norms.

A Tanzanian electrical engineer:

"As a woman, you are fully equipped to achieve whatever it is... you want to achieve. You are not less. There is no extra thing you are lacking as a woman...The main thing is you [sic] to believe you can and that you are enough. That's the one thing they should know."

A Malawian road engineer:

"I think women are blessed. We have knowledge, we think a lot, and we are detailed. We can even perform better than men... Women have these gifts, and we need more female engineers."

A Ugandan civil engineer:

"They can do what a man can, if they believe they are wise. They can be even more than a male can be, when it comes to intelligence...When you are a female, the sky is always the limit."

A Kenyan web developer:

"It is a very good experience for a woman because you get to challenge yourself every day and motivate yourself...When you get into a room, and you find so many men, and you are the only girl, you should be proud of yourself...It has taken your strength, your physical strength and effort to get there."

Intentionally build your network and seek mentorship.

A Kenyan telecom innovator:

"Be intentional, and be a go-getter...Use the opportunities that are there: go to networking events, meet people. Be intentional about getting the contacts and stay in touch because, in the world today, people like working with people they trust...And please find mentors and drive mentorship conversations. Call your mentors; don't wait for them to call you."

A Ghanaian agricultural tech innovator:

"Find someone you can talk to. It doesn't necessarily have to be another woman, but there is always someone you can talk to. Someone who has more experience and can give you the right advice. So, just find that person."

There is no one better placed to design solutions for women than you.

A Ugandan engineer:

"I think [entering the sector is] a chance for people, for ladies, to find real solutions to our real-life problems, yeah, and I think that's fulfilling."

A Kenyan telecom innovator:

"A lot of the apps and products that are designed, they bear the signature of the designer. So, we have a lot of men designing stuff. So, of course, things will be skewed towards men...But then when we have women taking charge in the innovations and design, we will see more inclusivity."

A Ghanaian STEM professional:

"There are a lot of challenges that women face [that] women who are in tech can actually help solve...If [you] give up and not join the sector, it means you won't be able to get a solution to that problem."

A Rwandan statistician:

"They can build their brighter future, and it can make them respected and valuable in the society...You can do a lot of good things that sustain your institution, your society, and the country in general."

Conclusion: Cultivating confidence in a supportive environment

Listening to the stories of young women in STEM, they do not see their success as isolated to a specific moment. Instead, they see their success as a journey through a complex landscape with a largely supportive cast of characters, where they are powerful actors. So, what makes a young woman successful in STEM?

A YOUNG WOMAN HERSELF.

These young women are their own biggest champions. They are self-possessed, strong, and goal-oriented. They know what they want, and they do not let negative opinions get in their way. Neither do they let the inevitable challenges that they face stop them. They have the confidence, determination, and perseverance to succeed in gender-non-traditional fields. They inspire, and the advice they have for other young women reflects the strength of character that has supported their own success. They see themselves as able to change the world around them through the solutions they can offer by using their STEM skills. But they feel too that they have the ability to change the world by being women who are challenging gender norms.

HER SUPPORT SYSTEM.

These women have robust support networks. People matter most in their success stories. People who encourage them to be confident; people who push them to grow their skills and take on leadership roles; and people who take pride in their success. They, in turn, value the support of these people — their parents, their partners, and their mentors — in lifting them up when their inner strength falters. Their mentors are the most critical figures in their journey, giving them emotional as well as practical and technical support.

HER LANDSCAPE, AND HOW SHE THRIVES IN IT.

Young women succeed where their environments support them, and they rise above their circumstances where they don't. Their educators are generally supportive of their interests, but where they are not, they can manage. Their employers generally value their expertise, but where they do not, they can manage. Their male colleagues may question their competence, but they have built strategies so they can manage. And these people's opinions do not matter to them nearly as much as those in their support network, or their own. While they face barriers in their landscapes, they have seen that gender norms are changing to be more welcoming of their contributions, and are confident that the next generation of young women in STEM will have it better, in part because of their work.

Recommendations

Young women already possess the power, passion, and capacity to succeed in the STEM sector. However, they could use more support from other actors to achieve their dreams. Based on our findings, we call on other actors to support young women interested in STEM careers in the following ways:

Organizations and Development Practitioners should...

Consider developing programs and initiatives in line with the design elements that our research suggests. According to the experience of the successful women we spoke with, the following things are critical for any initiative seeking to support young women's inclusion in the STEM sector. The ideal program or initiative should:

- Identify young women who have an interest in the sector and nurture their passion by providing them with practical exposure to STEM careers. It should also target support to improve women's early academic success to reinforce their passion and capability. Such programming should guide young women through visioning exercises so that they can set career goals and develop a plan to achieve them. It should also build a young woman's positive self-image and strength to give her the tools she needs to respond to challenges along her career path.
- If nothing else, connect and match these young women with two types of female mentors: peers who are just a few steps ahead in their journey, and who can provide relatable current advice; and those more established in their careers, who can provide longer-term advice and help young women to plan their own career path.
- Target messaging and deliver programming not just to a young woman alone, but also to those who are important in her close social circle. Specific individuals to target include: her parents (particularly her father) to act as champions for her journey, and her male counterparts, to shift their views on gender towards understanding how romantic partners can support each other's goals and manage household responsibilities.
- Focus additional programming on supporting employers to review their workplace cultures, encouraging hiring teams to consider how gender stereotypes impact how they perceive talent, and encouraging young women's male colleagues to see themselves as partners in creating a safe, inclusive, and respectful workplace.

Young Women in the Sector should...

Recognize that they could be the greatest catalyst for their younger sisters' success. Where possible, they should volunteer their time and expertise to mentor the next generation of STEM professionals. Given the support that they themselves valued from their mentors, they will have the biggest impact if they provide in-depth support to a few young women, walking their journey with them.

Parents should...

Use the powerful role that they play in their children's lives to be champions of the career choices that their children make for themselves. They should support their children in their successes by showing their pride in them, and in their challenges by reminding them of how capable they are.

Employers should...

Critically analyze their workplace cultures to decide whether they allow enough space for young women to make valuable contributions. They should develop inclusive hiring policies that think progressively about what talent looks like. They should engage in listening exercises to hear the challenges that young female employees face with their male counterparts. They should develop action plans that involve male employees as partners in building a better work environment. They should see the business case in taking these measures: unlocking the potential of young women and reducing the barriers they face enhances their productivity.

Training Institutions should...

Acknowledge and maintain the gains that they have made in supporting young women's entrance into STEM courses by creating a supportive and encouraging environment. They should continue to welcome female enrollment in STEM courses and training programs, and encourage instructors to create a warm environment.

Governments should...

Support the enabling environment that young women need to succeed, particularly by including safe and inclusive educational and workplace environments in policymaking.

Donors should...

Fund projects and programs in line with these recommendations, particularly with the core design components mentioned above. They should move beyond programming that focuses only on young women to more holistic programming that invests in building support systems and dismantling barriers women face in education and the workplace.

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2019-2020 Mastercard Foundation Youth Think Tank Biographies

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Hero-Godsway is an agricultural engineer and former Mastercard Foundation Scholar from Nkrumah University of Science and Technology. He is currently a Teaching and Research Assistant at the Department of Agricultural and Biosystems Engineering.

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Abigael holds an honours degree in disaster management and is currently pursuing her masters in international development at Nottingham Trent University.

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Maureen is a community resource management graduate from Machakos University. She is passionate about youth advocacy and child protection, women's empowerment and gender equity, as well as environmental advocacy and humanitarian work.

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Timon is a third-year epidemiology and biostatistics student at United States International University. He is passionate about community health development, particularly the well-being of young people, gender equity, and meaningful youth engagement.

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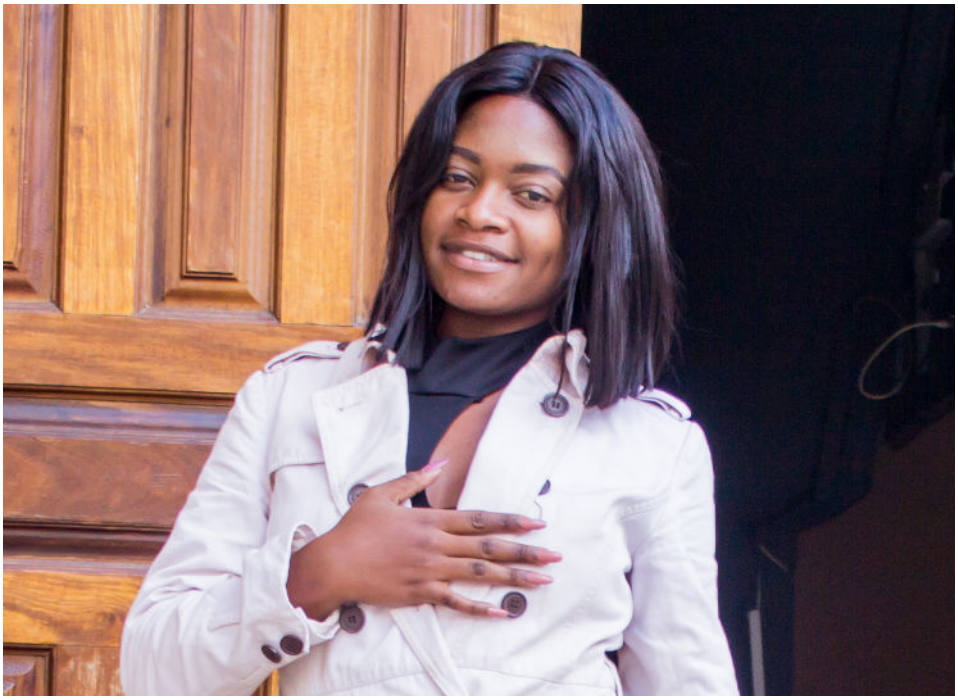
Chisomo is a nutrition and food science graduate from Lilongwe University of Agriculture and Natural Resources. She is currently an ambassador for UNICEF Malawi's U-Report and an advocate for meaningful youth engagement.



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Lyiandra is a communication and cultural studies graduate from the University of Malawi, Chancellor College. She is a global advocate for child justice and currently serves as an ambassador for the Norwegian Agency for Exchange Cooperation.

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Mbumba is an aquaculture, fisheries, and natural resources graduate. She currently works as a junior technical advisor with GIZ on aquaculture value chains for higher incomes and food security. She is passionate about community development.

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Alice is a global challenges graduate from the African Leadership University and is currently pursuing an MBA at Quantic School of Business and Technology. She is a co-founder of Starlight, a STEM social enterprise that makes educational products for young people.

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Diana is an enterprise management graduate from Kirinyaga University. She is a Grow with Us 2021 fellow for Afro-political feminism. She currently supports young people in their career choices as an ambassador of Miss Career Africa.

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Habiba is currently a management and communications assistant for SNV, a Netherlands development organization. She is passionate about communication and volunteers her skills in various youth programs aimed at achieving socio-economic transformation.

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Gloria currently serves as a project lead for Youth and Philanthropy and a regional coordinator for Innovation for Change Africa Hub under the Africa Philanthropy Network. She is an SDG Champion award recipient from the United Nations Tanzania office.

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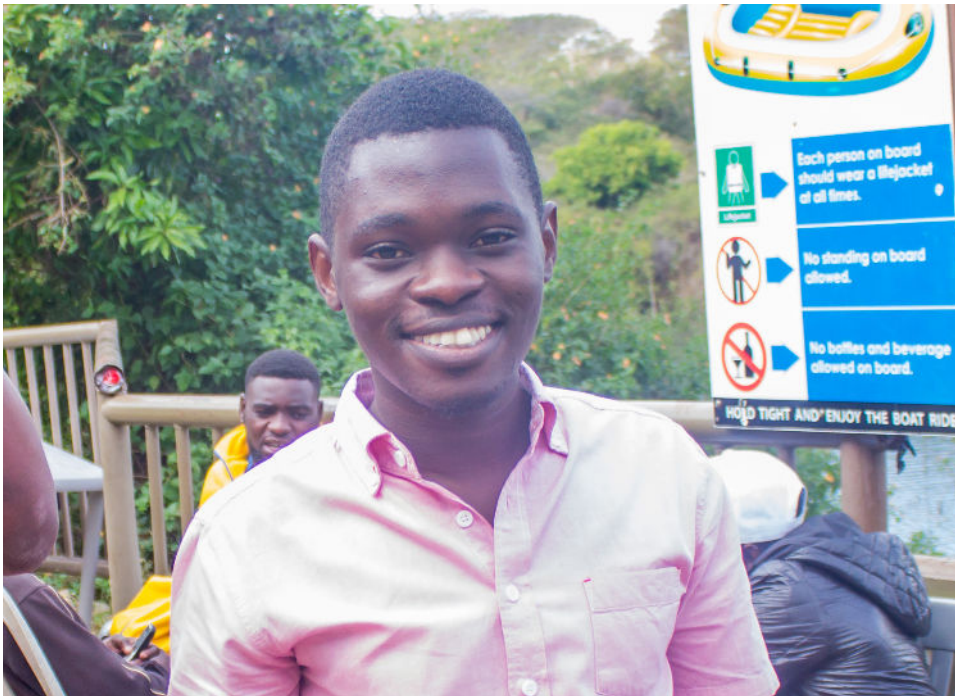

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Kelvin is a law graduate from Uganda Christian University Mukono. He is currently pursuing further studies at the Law Development Centre in Kampala. He is actively engaged in human rights advocacy.

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Suzan is a final year environmental health sciences student at Makerere University. She co-founded Girls Alive Project, an initiative that makes reusable sanitary towels and teaches menstrual hygiene to promote girl children's education.

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Innocent is a Master of Public Health candidate at the University of Zambia. He serves as a Trustee on the Board of Restless Development Zambia. He is also a research assistant at the Centre for Infectious Disease Research in Zambia.

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Tiza is a development studies and gender graduate from the University of Zambia. She is a 2020/2021 Global Health Corps fellow and is working in data surveillance as well as community curriculum development and training for Malaria Elimination at Path.

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Wendy is an undergraduate student studying business administration. She also serves as a Trustee on the Board of Restless Development Zambia. She is passionate about youth leadership.

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