“STEM education for girls and women is an essential factor in enabling and empowering women to fulfill their potential, ultimately permitting them to address the changes that are needed to advance economic growth in their home countries and regions.”

Ms. Roseline Chapel
President,
Schlumberger Foundation
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In 2017 the Schlumberger Foundation continued with its flagship Faculty for the Future program focused on advanced academic research in science, technology, engineering, and mathematics (STEM) disciplines for women scientists from the developing world, where they remain dramatically underrepresented.

Half of the workforce is deprived of untapped talent and innovation opportunities in these countries where women are frequently denied the chance of pursuing STEM fields of study due to societal or economic barriers. By reducing the gender gap in STEM, the talent and capacities of these women can be developed for the benefit of their local communities, regions and nations.

STEM education is an essential factor in enabling and empowering these women to fulfill their potential. The Schlumberger Foundation continues to financially support women from developing countries in STEM research programs at top international institutes around the world. There, they acquire the technical and soft skills needed to build their confidence and pave the way for them to instigate decision-making processes in key socio-economic developments in their home regions. The high-level academic success achieved by these women leads naturally to the influence that they can wield in their local communities; an influence which in the long term will contribute to reducing the gender gap in STEM education.

The research topics of the 2017 cohort of new Fellows cover a wide spectrum of disciplines including chemistry, biological sciences, health sciences, computer sciences and agriculture, reflecting the regional challenges they encounter. Most of the research proposals selected demonstrate the determination of these scientists to improve conditions in their native regions through science.

The profiles of the scientists discussed later in this report give a glimpse into the remarkable journeys undertaken by these women and illustrate that their unwavering determination and their love of science are carving out the path for other women to follow in their footsteps. We look forward to accompanying and supporting many more women like these in the future, even if it is only on a small part of their journey.
In 2017, the Schlumberger Foundation continued with its flagship Faculty for the Future program providing academic opportunities in STEM disciplines to female scientists from the developing world by financially supporting their studies at renowned universities and research institutes to obtain a PhD degree or conduct post-doctoral research.

The key goal of the program focuses on the theme of gender gap reduction in STEM education by breaking down the economic barrier that prevents women from achieving their educational ambitions.

In 2017, the Faculty for the Future program continued to attract high quality applications, with 613 applications submitted representing a decrease of 27% year-on-year (YoY). In addition, 157 renewal applications were submitted marking a 12% decrease from the previous year. Following a rigorous selection process involving four evaluation rounds and the involvement of over 35 Schlumberger scientists, 38 new grants were awarded bringing the total population who has received financial support from this program to 633 female scientists coming from 81 developing countries and studying in 30 host countries around the world.

Grant spend decreased by 17% YoY reaching $6.3M. A total of $2.3M was disbursed to grantees studying in universities in the US (vs $2.6M last year) while $1.7M was disbursed to grantees in the UK (vs $2.3M last year). The remainder was disbursed to students at universities in Australia, Canada, Europe, Japan and South Africa.
THE FACULTY FOR THE FUTURE PROGRAM IN 2017:
RESEARCH TYPE AND COUNTRY OF STUDY
633 FELLOWS FROM 81 COUNTRIES STUDYING IN 30 HOST COUNTRIES

Faculty for the Future Program
Recipients of the 633 Faculty for the Future Fellowships awarded to date come from developing and emerging economies representing most of the world’s continents. They have benefitted from attending leading research institutes in 30 host countries around the world.

In 2017 the choice of research projects were from core scientific domains (chemistry, physics and mathematics). Many other fields such as civil & environmental engineering, agriculture, bioengineering, environmental sciences, computer engineering, hydrology, nutrition and medicine were also in evidence as many research projects directly focused on home country related issues.
THE FACULTY FOR THE FUTURE PROGRAM IN 2017:
CITIZENSHIP AND COUNTRY OF STUDY
633 FELLOWS FROM 81 COUNTRIES STUDYING IN 30 HOST COUNTRIES

AMERICAS
1 United States: 217
2 Canada: 25
3 Mexico: 1 / 13
4 Colombia: 13
5 Brazil: 10
6 Peru: 6
7 Ecuador: 4
8 Argentina: 3
9 Costa Rica: 2
10 Guatemala: 2
11 Nicaragua: 2
12 Venezuela: 2
13 Bolivia: 1
14 Dominican Republic: 1
15 El Salvador: 1
16 Guyana: 1
17 Haiti: 1
18 Trinidad and Tobago: 1
19 United States: 217
20 Canada: 25
21 Mexico: 1 / 13
22 Colombia: 13
23 Brazil: 10
24 Peru: 6
25 Ecuador: 4
26 Argentina: 3
27 Costa Rica: 2
28 Guatemala: 2
29 Nicaragua: 2
30 Venezuela: 2
31 Bolivia: 1
32 Dominican Republic: 1
33 El Salvador: 1
34 Guyana: 1
35 Haiti: 1
36 Trinidad and Tobago: 1

EUROPE
20 United Kingdom: 176
21 Germany: 31
22 Netherlands: 26
23 France: 12
24 Belgium: 10
25 Sweden: 7
26 Italy: 5
27 Finland: 4
28 Spain: 4
29 Norway: 2
30 Austria: 1
31 Denmark: 1
32 Ireland: 1
33 Portugal: 1
34 Russia: 1 / 4
35 Switzerland: 1
36 Ukraine: 2
37 United Kingdom: 176
38 Germany: 31
39 Netherlands: 26
40 France: 12
41 Belgium: 10
42 Sweden: 7
43 Italy: 5
44 Finland: 4
45 Spain: 4
46 Norway: 2
47 Austria: 1
48 Denmark: 1
49 Ireland: 1
50 Portugal: 1
51 Russia: 1 / 4
52 Switzerland: 1
53 Ukraine: 2

MIDDLE EAST
63 Iran: 1 / 9
64 Turkey: 11
65 Palestinian Territory: 5
66 Jordan: 4
67 Iraq: 3
68 Syria: 2
69 Kuwait: 1
70 Lebanon: 1
71 Oman: 1
72 Yemen: 1
73 Iran: 1 / 9
74 Turkey: 11
75 Palestinian Territory: 5
76 Jordan: 4
77 Iraq: 3
78 Syria: 2
79 Kuwait: 1
80 Lebanon: 1
81 Oman: 1
82 Yemen: 1

AFRICA
87 South Africa: 47 / 5
88 Kenya: 1 / 23
89 Nigeria: 90
90 Ghana: 21
91 Zimbabwe: 15
92 Tanzania: 14
93 Uganda: 14
94 Egypt: 13
95 Ethiopia: 11
96 Cameroon: 7
97 Sudan: 6
98 Zambira: 6
99 Madagascar: 5
100 Malawi: 5
101 Algeria: 4
102 Lesotho: 4
103 Namibia: 4
104 Rwanda: 4
105 Benin: 3
106 Botswana: 2
107 Mozambique: 2
108 Sierra Leone: 2
109 Liberia: 1
110 Libya: 1
111 Mauritius: 1
112 Morocco: 1
113 Somalia: 1
114 Sudan (Republic of): 1
115 Swaziland: 1
116 Togo: 1
117 Tunisia: 1
118 Uganda: 14
119 Egypt: 13
120 Ethiopia: 11
121 Cameroon: 7
122 Sudan: 6
123 Zambira: 6
124 Madagascar: 5
125 Malawi: 5
126 Algeria: 4
127 Lesotho: 4
128 Namibia: 4
129 Rwanda: 4
130 Benin: 3
131 Botswana: 2
132 Mozambique: 2
133 Sierra Leone: 2
134 Liberia: 1
135 Libya: 1
136 Mauritius: 1
137 Morocco: 1
138 Somalia: 1
139 Sudan (Republic of): 1
140 Swaziland: 1
141 Togo: 1
142 Tunisia: 1

ASIA
78 Japan: 14
79 South Korea: 3 / 1
80 Malaysia: 2 / 4
81 Indonesia: 1 / 38
82 China: 1 / 31
83 Singapore: 1
84 India: 68
85 Pakistan: 48
86 Bangladesh: 13
87 Viet Nam: 11
88 Nepal: 10
89 Philippines: 9
90 Sri Lanka: 5
91 Thailand: 4
92 Myanmar: 3
93 Mongolia: 2
94 Afghanistan: 1
95 Armenia: 1
96 Bhutan: 1
97 Cambodia: 1
98 Kyrgyzstan: 1
99 Japan: 14
100 South Korea: 3 / 1
101 Malaysia: 2 / 4
102 Indonesia: 1 / 38
103 China: 1 / 31
104 Singapore: 1
105 India: 68
106 Pakistan: 48
107 Bangladesh: 13
108 Viet Nam: 11
109 Nepal: 10
110 Philippines: 9
111 Sri Lanka: 5
112 Thailand: 4
113 Myanmar: 3
114 Mongolia: 2
115 Afghanistan: 1
116 Armenia: 1
117 Bhutan: 1
118 Cambodia: 1
119 Kyrgyzstan: 1

OCEANIA
99 Australia: 33
100 New Zealand: 3
101 Papua New Guinea: 3
102 Fiji: 1

"Fellows" refers to current and former grantees of the program.
THE FACULTY FOR THE FUTURE PROGRAM IN 2017: HOST UNIVERSITIES

633 Fellows from 81 Countries Studying in 30 Host Countries
Faculty for the Future Regional Forums in 2017
Fostering Women Leaders in STEM

Since the program was launched in 2004, the Schlumberger Foundation has hosted 17 in-person gatherings for Faculty for the Future Fellows to help foster an international community of women leaders in science, technology, engineering and mathematics (STEM). The meetings are hosted yearly in association with prominent universities where Fellows are pursuing their studies and bring together both current grantees and program alumnae.

Forums in the past have been held in the United Kingdom (London and Cambridge), in France (Paris and Clamart), in the United States (New York, Cambridge and Houston), the United Arab Emirates (Abu Dhabi) & Cape Town (South Africa).

The most recent Forums took place in Cambridge, in the United Kingdom and Bandung in Indonesia. At the Bandung Forum, which was the second time the event was held in Indonesia, there were over 40 Fellows and Alumnae in attendance, and the gathering in the UK brought together over 60 participants.

During the Forums, the Fellows meet and engage with distinguished scientists and hear accomplished leaders share their insights on topics such as how to support the next generation of young women in STEM. Through knowledge-sharing sessions and panel discussions, participants learn skills and techniques to raise their visibility and improve their chance of successfully impacting their community and beyond both in their fields of science and socially, by creating conditions to enable more girls and women to follow their scientific path.

Speaking about the Forum in Bandung, the Schlumberger Foundation president, Roseline Chapel, noted that “through the Faculty for the Future Forum, our goal was to share the experience of the Alumnae who are back home in Asia and ignite the power of each fellow within a network of like-minded women who have the potential to change the world through and beyond their own actions. Not only do Fellows and Alumnae bring innovation and knowledge to resolve world challenges, they also offer powerful inspiration to generations of women and girls who are encouraged to follow their example and pursue a path in science.”

With approximately 30 to 70 grantees in attendance, a regional Forum provides an opportunity for participants to meet and share research and life experiences, to initiate international collaborations, to learn techniques to spread and communicate their research, to meet and network with well-known scientists and other accomplished leaders who might act as career mentors, and to discuss such things as work / life balance and other gender specific issues.

The ultimate goal is to create a community of women leaders in STEM who will support the socio-economic development of their native regions by strengthening the faculties in their home universities through teaching and conducting research into relevant local challenges, inspiring other young women to pursue STEM careers, and use their scientific expertise to influence policy making and catalyze socio-economic development locally and internationally.
Role Models in STEM
Three Inspiring Journeys

The following three women scientists from Pakistan, Tanzania and Papua New Guinea talk about how their early interest in science was first kindled and about their journeys to successful completion of their chosen fields of study. They have each in their own way become strong role models and mentors for other girls and women around them demonstrating that determination, hard work and being able to pick yourself up when you fall, are rewarded in the long run.
My parents have always told me that I was an inquisitive child: curious about people, things, the environment, and life itself. This innate curiosity sparked awareness of the issues around me from an early age and it was the main motor behind my strong desire to make a positive difference in the world. My heroes were those individuals who succeeded in making a difference, however small, to make this world a better place to live in. Consequently, I started to map out a challenging journey for myself that I was convinced would be rewarding if I stuck to it. The obstacles and challenges that sprouted frequently along my path were tackled with consistent hard work, determination and zeal and I focused more on modifying my environment rather than allowing circumstances to change my decisions.

Opting for Engineering at undergraduate level, followed by a master’s degree in Electronics from Quaid-i-Azam University, Islamabad, was my first challenge, as these choices opposed the norm of selecting medicine as the career path for a smart, intelligent female at that time. These choices however, inculcated in me a desire to explore untraveled paths and led me to achieve goals which are generally unattainable by a middle-class female from Pakistan. Although my family was always supportive of my unconventional choices, the same was not true for society at large.

Not only did I want to challenge my circumstances, I also wanted to have a deeper impact on my surroundings; therefore, I chose to teach at a girls’ technical institute for underprivileged females most of whom could barely afford the $100 annual fee. In many ways, this experience has been the most rewarding and fulfilling time of my life. I taught them courses in computer science and electronics. Seeing them flourish was such a reward! I was their teacher, friend, mentor, and much more. Some of these women got better jobs than myself, making me their proud teacher!

This hard work was recognized by two Best Teacher awards, in addition, of course, to the reward of witnessing my female students blossoming in Engineering. I soon became the local resource in female empowerment training conducted by international organizations which contributed to sharpening my qualities as a planner, leader, and decision maker. I was also the coordinator of a project to establish this institute as a Model Institute. By the end of the project, I had learned to work under constant pressure, encouraging people from diverse backgrounds to work together, transforming unfavorable situations into workable solutions and in short, had become a successful leader. Furthermore, the on-job training I had received abroad helped me to eradicate the misconception of Pakistani women as belonging to the dormant part of society.

After serving this institute for many years, people around me failed to understand my desire to leave a safe cocoon and venture into uncharted territory. However, my ambitious nature and supportive family made it possible for me to complete an MSc in Computer Engineering from University of Engineering and Technology, Islamabad, followed by a position as a senior lecturer. At the university, I taught subjects that were considered too technical for females and people were once again surprised by my strong abilities in these fields.

In 2011, I obtained a Fulbright scholarship to do my PhD in the USA. As I possess a special knack for integrating knowledge effectively from various domains, I decided to combine my engineering background with neuroscience to help improve mental health by studying brain functions. I had no prior knowledge of the brain, but this did not prevent me from taking on the new challenge. As a result, I comprehended and modeled the changes in brain functional networks that may now be the key in understanding human behavior and diseases of the brain. This research resulted in high quality publications and helped pave the way for future Pakistani female scientists.
I then joined an engineering university in Pakistan as an Assistant Professor. Once again, I chose an untraveled path and became a pioneer in neuroscience and engineering integrated research at this university. I quickly realized, however, that it was necessary to continue expanding my research in order to become independent. The Schlumberger Faculty for the Future fellowship allowed me to join the Rotman Research Institute in Canada as a postdoctoral fellow where I am currently exploring the relationship between brain and behavior. I plan to model the individual brain using ‘the Virtual Brain’ platform and set up my own research group.

In the future, I plan to establish a research facility in Pakistan focused on brain health. This facility would be involved in multidimensional research such as the study of brain disorders, modeling of the healthy and malfunctioning brain, as well as building devices for brain health monitoring. I plan to collaborate with relevant research groups in Pakistan on this. My goal is to encourage and inspire female engineers, doctors, and neuroscientists to work together to establish this facility. I would like to target those professional females who choose to stay at home, but who would also like to contribute to society. My dream is to provide them with the option of working part-time or full-time from home, so they can contribute towards the growth of this specific research on brain health. My own life experiences have shown me that even just one individual can be powerful enough to positively impact the world. I would like to be that person and I am determined to help create more such people. I am glad that I chose the unconventional path. As Robert Frost, in his well-known poem called “The Road not Taken” eloquently puts it:

“Two roads diverged in a wood, and—I took the one less traveled by, And that has made all the difference.”

Magreth Mushi from Dar es Salaam in Tanzania recalls her journey from the time, as a child, she would gaze in awe at the computer her mother worked on as an Accountant. She was fascinated with the way letters and figures would appear on its screen and she vowed that one day she would find out how this large piece of hard plastic and glass functioned. So, following in her mother’s footsteps she embarked on Accountancy training, first and foremost she thought, to earn the same level of respect that her mother enjoyed in the local community. Everything was going to plan until, a little bit older and wiser, she realized that her uncle, who was an Engineer, earned an even greater level of admiration and respect. She decided there and then that she wanted to be like him and began to figure out which field of science she was most suited to. It quickly became clear to her that her childhood passion for computers was the right choice to make and off she set on this path working hard, long hours and at weekends to make sure she fit into that so called “men’s field”.

Magreth Mushi
From Pioneering Female Student to Passionate Female Mentor

I then joined an engineering university in Pakistan as an Assistant Professor. Once again, I chose an untraveled path and became a pioneer in neuroscience and engineering integrated research at this university. I quickly realized, however, that it was necessary to continue expanding my research in order to become independent. The Schlumberger Faculty for the Future fellowship allowed me to join the Rotman Research Institute in Canada as a postdoctoral fellow where I am currently exploring the relationship between brain and behavior. I plan to model the individual brain using ‘the Virtual Brain’ platform and set up my own research group.

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“Mentoring involves lots of things”, Magreth explains. “It involves helping mentees to understand that they have capabilities and that there is nothing wrong with failing. Everyone fails at some point, it’s human nature. And it’s fine to fail several times, too! We can learn so much from our failures even though we don’t go writing about them on our CVs!”. “I often tell young girls the story of how I failed to make the first-class mark to get into College but how it did not prevent me from achieving my goal. Far from it! It helped to shape the person I am today.”

Magreth currently lives in Tanzania with her family, including three daughters. In addition to TERNET, she has also started a networking lab at the Open University of Tanzania (OUT), where she is the Principal Investigator (PI), supervising Master’s and PhD students in the networking area. She has initiated a collaboration between MAGIC and OUT to establish a similar mentoring program at OUT. The program, named Big Sister in STEM (BigSiS), was launched in August 2017.

From her own experience, Magreth is conscious of how essential it is for girls and young women to have role models and a support network. She helps tear down obstacles and barriers by fueling the imagination of girls by telling them that they can accomplish anything they set their minds to: nothing is impossible if they believe in themselves, stick with their goals, work hard and don’t give up.

Finally, Magreth believes more women should become mentors. “I would like to call on all women in STEM careers to consider mentoring, sponsoring, and supporting girls and young women as they find their voices in these male-dominated career paths. Whether that is through BigSiS, or any other means, we need to be the rock on which they can lean and be the real live example for them that spells out clearly that women, too, can and do excel in science.”

Magreth MUSHI
Continued From Previous Page

remarks like these, however, made Magreth work harder than ever before. Their disparaging jibes fueled her motivation and determination to succeed. At the end of the first year, much to the consternation of the 98% male cohort, she was ranked among the top 10 students of the class. From that day, everything changed for her. Her confidence in her abilities was born and she commanded the respect around her that she had relentlessly sought after and earned.

Through the whole experience, I wanted to prove them wrong,” Magreth recalls. “I studied really, really hard, there was no stopping me. The more they taunted me the more I studied!” Since then, she has won a string of other prestigious awards and scholarships including the Faculty for the Future fellowship for 2 years to allow her to complete her PhD in network security at North Carolina State University in the United States.

Magreth feels fortunate that she had the support of her mother to pursue computer science. In addition, she had the rare backing of a maternal grand-father who was an advocate for the education of women in his community. As the concept of female mentors in STEM was not popular when she had begun her College journey, Magreth started up her own mentoring program for females in Tanzania in 2010. She is currently the CEO for Tanzania Education and Research Network (TERNET), a network of Tanzanian higher education and research institutions that provide infrastructure and associated services to promote sharing of education and research resources in Tanzania and beyond.

During her studies in the US, she met the founder of More Active Girls in Computing (MAGIC) which provides one-on-one mentoring to encourage girls and young women to develop the confidence and skills they need to study and succeed in STEM subjects in middle and high school. Given Magreth’s natural desire for mentoring, she applied and got the opportunity to be a mentor with MAGIC since 2013, and in 2016 she was invited to become a board member of this organization.
Regrettably, during my 4-year research period, the IBR program experienced the loss of qualified staff to better paying jobs. One of the major challenges for small, in-country NGOs is retaining an attractive renumeration package for qualified individuals to keep up with the high cost of living in urban areas, as well as the high cost of research. IBR was not immune to these problems and consequently slipped into a dormant phase.

Currently I am volunteering my time to see how I can help revive IBR and literally waken it up again as I firmly believe in its vision: improving scientific capacity in PNG through research, awareness and conservation by safeguarding its biodiversity, food security, and rich cultural heritage. It had been doing so well: between 2010 and 2015, over 100 participants had been trained through IBR’s short courses to hone their skills and learn new techniques. These courses enabled us to select candidates for our 2-year internship program. Twelve interns joined the program and were mentored by a team of national conservationists. Seven female interns completed the program and are now either furthering their education (MSc) or working in universities. One of these women went on to successfully complete a PhD program at the University of St. Louis Missouri (UMSL).

Reviving IBR will require time and careful planning. However, I am determined to continue with my efforts to make those around me see the value of the country’s natural scientific “reservoir” and teach them to cherish its rich biodiversity for the benefit of all. I will not give up on this. Perhaps, somehow, through my own motivation and passion, I will finally succeed in nudging others into action to preserve and conserve, to manage and to celebrate the vast expanse of natural resources, teaming with life, that is the hallmark of Papua New Guinea.