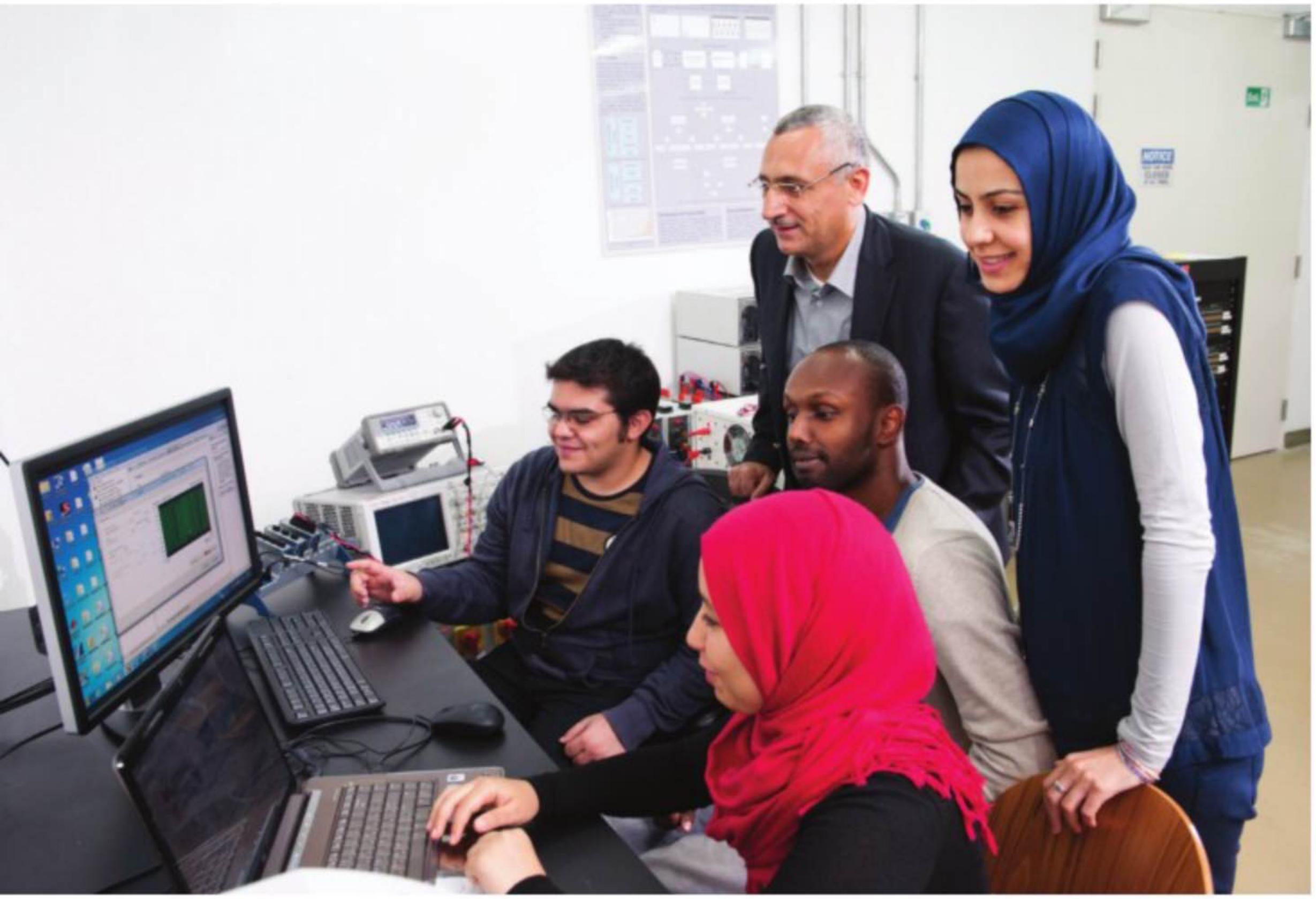
LEARNING TO RESEARCH

BY CONNOR SEARS



In pursuit of the National Vision 2030, Qatar is raising up the next generation of home-grown scientists and researchers.

Producing scientific research is a hallmark of advanced nations. A reliable way to tell when a country is becoming highly developed is to see when its contribution to the world theatre is no longer limited to manufacturing goods and exporting physical resources, but rather its main export comes in the form of knowledge. When a nation begins to traffic in research, it begins to actively advance the state of the world instead of only being a part of it. Through research, a nation can become a hotbed of innovation, producing new processes and technologies that help improve the lives of people across the globe.

Qatar is in the middle of creating its own research culture. The National Vision 2030 calls for Qatar to evolve into a "knowledge-based economy", a point at which Qatar can rely on its advancement of science and technology for income and is no longer dependent on the export of hydrocarbons. An increase of research production in Qatar could also help to find solutions to some of the problems the country faces today, such as water security and food security.

Qatar already has several institutions through which research can be conducted. Qatar University and the collection of international institutions in Education City both receive generous support from Qatar Foundation to conduct research, especially research that is aligned with helping to solve national needs. The infrastructure is largely present. What Qatar lacks, though, is the human element.

"Qatar's population is small, but we are ambitious and we have this vision for 2030," says Dr Abdulnasser Al-Ansari, Deputy Executive Director for the Qatar National Research Fund (QNRF). "Of course, a lot of things are happening at the same time, very fast and quick economic development. So the first challenge is we need researchers in Qatar. First of all, Qatar has a low population. Second, most Qataris tend to avoid research and development as a profession."

Encouraging research

According to Al-Ansari, most of these scientists and research managers are going to have to come from outside Qatar for now. Several programmes under the Qatar Foundation umbrella, however, are already focusing on developing the next generation of scientists and researchers right here in the country.

"There is a mechanism for creating this research culture and encouraging the people to enter this research activity. QNRF has an undergraduate research programme named UREP [the Undergraduate Research Experience Programme] that supports the faculty and the students to apply for research, oriented only for undergraduate students," says Dr Haitham Abu-Rub, who is researching renewable energy conversion at Texas A&M University at Qatar. "Many of the students, Qatari and non-Qatari, were even able to publish in journals, including Qatari and non-Qatari students. So there really is a mechanism, and excellent funds, to support the students."

QNRF offers many different programmes aimed at building the human capital that Qatar's research culture will need to

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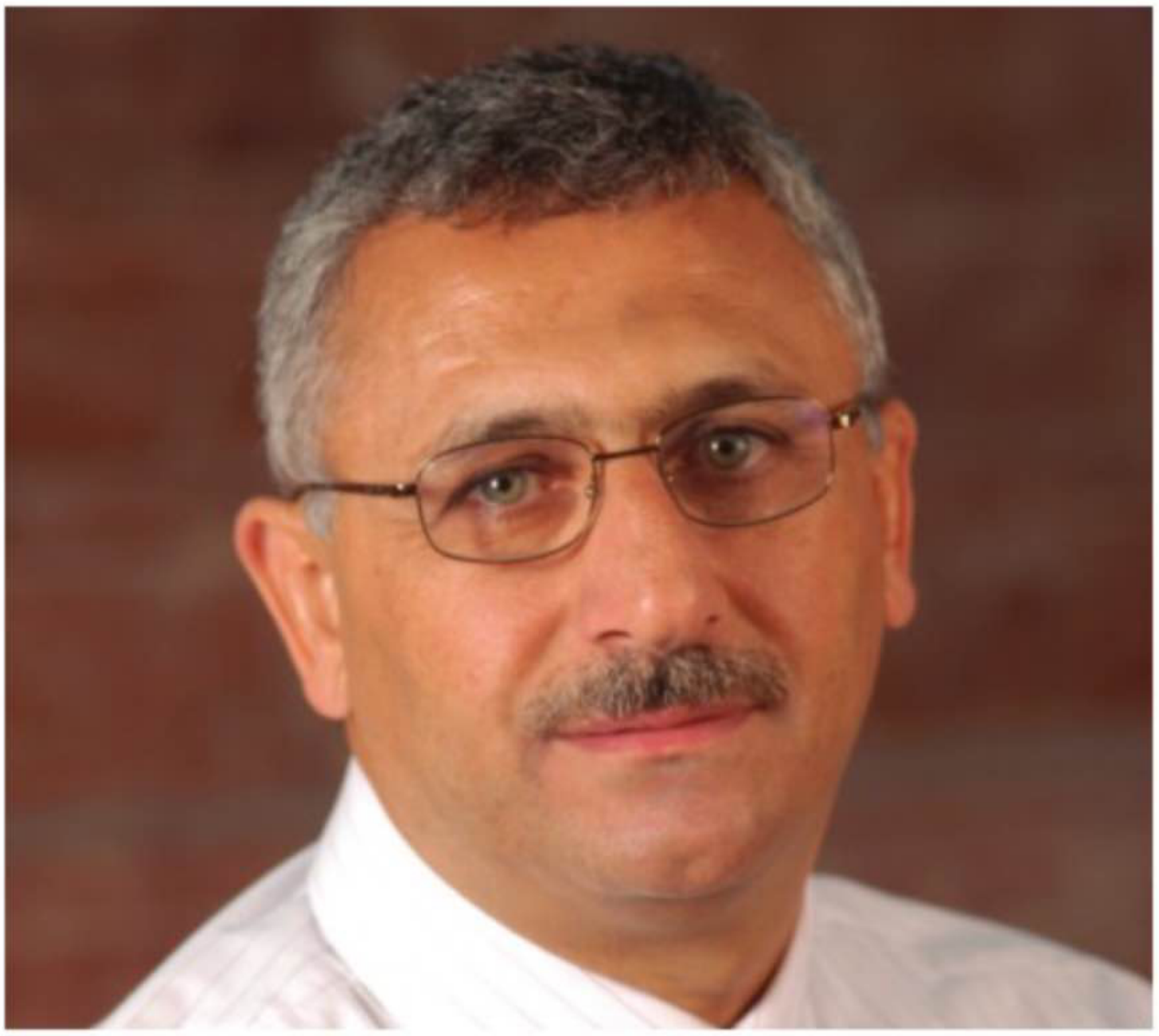

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develop in order to achieve the national vision. UREP is the agency's largest programme that hopes to encourage young people to strive for careers in research. The next-largest of these development programmes is the Junior Scientists Research Experience Program (JSREP). This offers funding for younger researchers who feel they cannot quite compete for the grand QR3,275,000 ($900,000) prize of QNRF's primary research grant. QNRF also offers programmes meant to support graduate students and post-doctoral students.

QNRF's third-largest programme is actually a prize rather than project funding. The Secondary School Research Experience Program (SSREP) attempts to inspire research aspirations in high school students.

"This programme basically aims at supporting high school students with their teachers," Al-Ansari says. "It is the concept of doing research under the mentorship of the teachers at schools. For this we basically award prizes; we don't award funding. And it has been successful."

For all the grants it awards, however, the QNRF looks for competitive candidates whose research subjects align with the Qatar National Research Strategy.

"We want good quality applications because everything is competitive and goes through a process of peer reviewing," Al-Ansari says. "We take these applications and send them to peer reviewers outside Qatar so that we avoid any conflict."

Leading the way

Another programme Qatar is using to build up the next generation of researchers is the Qatar Science Leadership Program (QSLP), run by Qatar Foundation. QSLP encourages science-minded students who have graduated from local universities to continue their education and eventually come back to Qatar to do research. The programme supports both Qatari students and resident students who have been educated in Qatar.

Misam Jaffer applied to QSLP after graduating from Texas A&M University at Qatar in 2010. Once he was admitted into the programme, Jaffer obtained his master's in mechanical engineering with a specialisation in energy systems from Stanford University. After finishing his education, QSLP connected Jaffer to the Qatar Energy and Environment Research Institute (QEERI) where he became a research associate working in the water security and desalination department. Throughout the whole programme, Jaffer says the financial assistance it provided allowed him to continue his education and was an important part of the experience.

"After graduation from undergrad, I had good grades – and I did have an interest to study further – but finances also play a pretty big role," Jaffer says. "That could be the difference between attending a very good university and a university that is not as good as the one that you could possibly have gotten into. So obviously the funding is a big portion."

QSLP's assistance doesn't stop at the

QR2.37 billion
Total amount of funding given since the creation of QNRF

QR455 million
Money given in QNRF grants in 2013

QR12 million
Money given to undergraduate students in 2013 via UREP

1,700

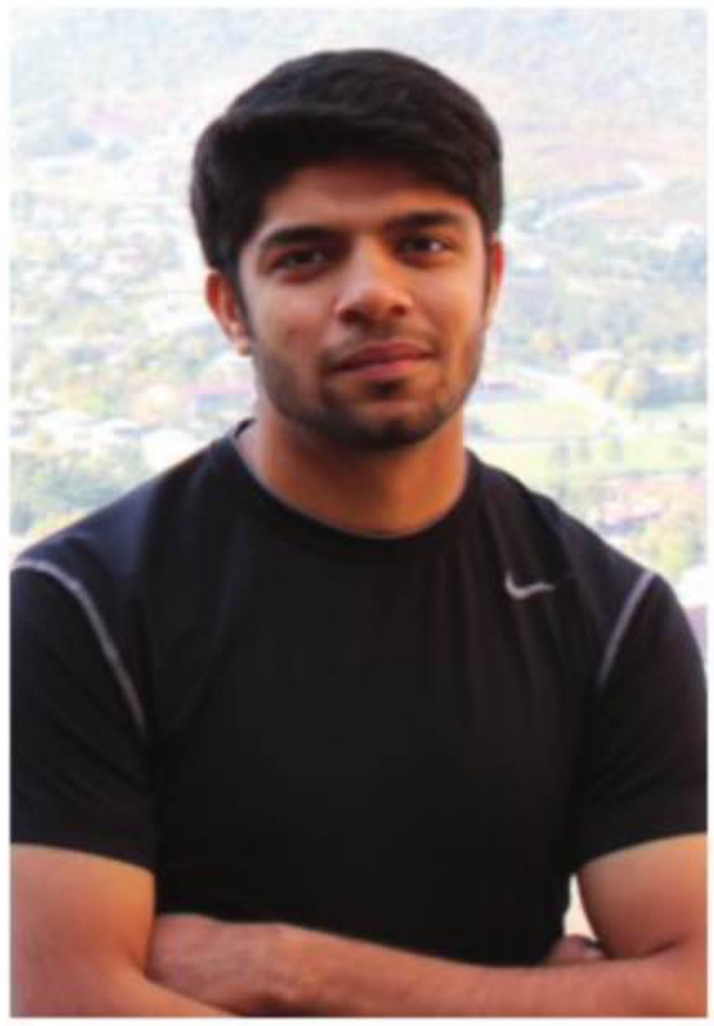
Total number of students who have participated in QNRF's Undergraduate Research Experience Program

820

Total number of students who have participated in QNRF's Secondary School Research Experience Program

24

Number of projects funded under QNRF's Junior Scientists Research Experience Program



chequebook, however. "They try to connect you with local researchers," Jaffer says. "In my case, when I had finished the first year in my master's, they introduced me to a few people at QEERI, where I am currently working. They introduced me to scientists there, and that was good for me because I could talk to them and see what they're doing. I could streamline my research interests with them or see where my research interests fit within the organisation. So it was nice. In a way, it was like making connections even before you came here."

Outside of QEERI, QSLP also helps place students at the Qatar Computing Research Institute and the Qatar Biomedical Research Institute, Jaffer says.

According to Jaffer, the relationship between students and QSLP doesn't even necessarily end when he or she begins work at a research institute. QSLP continues to keep in contact with both the student and the workplace, making sure that their new partnership is still productive, and taking feedback to help refine its own programme for the next cycle of applicants.

A bump in the road

One of the main challenges that stand in the way of building Qatar's next generation of researchers is the allure of industry work. For many graduates, the opportunity to take their newly-acquired knowledge to large firms is an enticing one, and not easily turned down.

"We have a lot of competition," Al-Ansari says. "This is also another challenge. Qatargas, Qatar Petroleum and other institutions, they will draw in those new career graduates. So we want to implant this love for research at an early stage."

"I think a great majority of students who graduate in science fields, they still prefer to go into the industry and work for a bit," Jaffer continues. "At least that's what I've seen from students in my year, students ahead of me and some who have graduated from after my year as well."

This challenge isn't enough to derail the cause, however. For this new year, QNRF is planning to expand its operations and inspire research-minded youngsters at an even earlier age with their new Middle School Research Experience Program.

"We want to change the environment, make more people attracted to science and research at a lower age, so that we in the next generation will be a generation that is familiar with research, a generation that we hope wants to do research," Al-Ansari says. "And we probably will go lower. You never know."

Challenges aside, Qatar has made enormous strides in developing a national research culture over the past decade. And if these institutions have their way, Qatar will be even closer to its ultimate goal of a knowledge-based economy ten years from now.

"I think they're headed in a good direction where there will be more significant growth in the coming years," Jaffer says. "I think it's a good time for students like me to be here. We have a lot of support and a lot of guidance, too."

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Research Associate
Qatar Energy and Environment Research Institute