ARTICLES

Is There a Future for Science in Palestine?

Photo courtesy of Al Nayzak.

By Wael I. Karain

There is something curious happening in the Faculty of Science at Birzeit University in Palestine. It seems that we have accidentally hit upon the recipe for increasing the female population in the basic sciences (chemistry, physics, biology, mathematics). However, we have also somehow managed to scare away almost all the males. So while universities in Europe and the United States are trying to attract more students – particularly females – to the basic sciences, we are trying to increase the number of males!

The following is not a thorough scientific study. It is a collection of observations that I have accumulated over the past 20 years in my capacities as a physics instructor, physics department chairman, and dean of the Faculty of Science. I hope that these observations will shed some light on some of the stereotypes – fuelled by the grim local-employment situation for science majors – that are held by people in Palestine about science and science graduates.

The first observation is that the ratio of females to males who major in science (overall in all four disciplines) has undergone a drastic change over the past 20 years. In the mid-1990s, the ratio of female to male graduates hovered around 1:1. This ratio started to climb in favour of female students in the late-1990s. Around the turn of the century, the ratio was about 2:1 in favour of females. During the last few years, the ratio of female to male graduates has climbed to about 9:1! In fact, it is a common occurrence nowadays for classes in science to have only one or two males. In one major, physics, there has been a complete role reversal. Whereas in the past, there was the "token" female graduate, now it is the "token" male graduate.

Science in Palestine is suffering. High school students – stressed by years of having to memorise formulas and solve arcane problems in school, as well as being taught by underpaid, unenthusiastic teachers – avoid majoring in science in college, and hold negative notions about it. This threatens the future of Palestinian society, which desperately needs to invest in science and scientists to be able to compete in the world economy.

This reversal is not merely a curiosity. It has many serious consequences. First, it is leading to a steady decrease in the male teacher population in Palestine, which is not being replenished by qualified new graduates. Although this might not be a problem in Western societies, it is particularly problematic in Palestinian society. This is especially true in rural areas, for all-boys schools. Second, fewer and fewer graduates are travelling abroad to pursue graduate degrees in science. Scholarship offers from universities abroad go unfilled each year due to the lack of qualified graduates who are willing to apply. Most of the female graduates are married by the time they graduate, and they find it difficult to travel abroad with their families due to the high cost involved. Some of the graduates, still single, are not able to travel due to social restrictions. Lately there has been an encouraging trend, although modest, of female students willing to travel abroad, with families, or as single students. Female graduates in general, however, still have to choose between pursuing careers in science and starting a family. In addition, they have to confront deeply entrenched biases. One female administrator was once overheard saying that offering graduate school scholarships to female students is a waste! "They come back, get married, have children, and forget about science."

The second observation concerns the specific disciplines sought out by these science graduates. There is a steady decrease in pure-science majors, and a corresponding increase in the number of multidisciplinary science majors. For example, students shy away from majoring in pure physics or pure math, and are more likely to major in physics/electronics or math/economics, respectively. This can be partially explained by the lack of job opportunities for those graduating with pure-science majors. Students are more likely to find a job if they major in chemistry and minor in marketing, for example. This multidisciplinary approach can also help students do cutting-edge work in graduate school. It might encourage male students to major

Physics graduates at Birzeit University.

in science if it offers another area of work besides teaching. Male students, in general, will go into teaching as a last resort, whereas female students often find teaching to be a suitable profession.

The third observation is that while the total number of students at Birzeit University has increased threefold over the last 20 years, the number of science graduates, and the number of students who enrol in science in general, has not changed significantly. This is due to the stereotype – partially justified by the types of hiring opportunities in the field of science – that science graduates can only be teachers. In fact, a parent of one student was once overheard pleading to one of the student's teachers: "Please try to help him to graduate. If all else fails, he can always get a job as a teacher." Teacher salaries are low, and the teaching profession carries little prestige. Students would rather major in subjects that they perceive to have more prestige, even if in reality, their employability is not much greater than that of science majors. It is common for an engineering graduate to work as a physics and math schoolteacher. Although graduating as an engineer does not guarantee employment, the social prestige of the title "engineer" is more than enough to draw students to those majors. Students will also major in subjects they perceive as "easy," such as business.

The general trend of shying away from science, and the low prestige of science, could lead to difficult problems for Palestinian society in the long run. After all, to build a viable economy, scientific research has to be one of the pillars of economic development. Sadly, this is not so in Palestine. There is almost a complete disconnect between the few industries present and the academic community. The symbiosis that has benefitted highly developed societies has yet to gain a foothold in Palestine.

There are solutions for these problems. Salaries for schoolteachers should be increased to attract the best graduates, male or female. Good teachers can pass on their enthusiasm and love of science to younger generations. Companies in the food, medicine, and energy sectors should invest more money in research and development in order to offer new horizons for science graduates. Interesting combinations of majors should be made available for students to combat the negative stereotypes about the uselessness of science. These majors should be based on the needs of the local society, thus improving the employability of the graduates. And universities should provide students with all-around skills to help them navigate a tough job reality, and not just concentrate on pumping them full of scientific knowledge.

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