
Brain Drain -Is a Problem or an Advantage?

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Brain drain has been a hot topic of discussion for many years in Turkey. Many have studied it sociologically and discussed it from different angles. Was it the economical crisis or uncertainty that drove young people abroad, or the quality of graduate schools abroad, or the wide array of opportunities in various technical fields?

I believe there is no one clear answer to this question. More likely than not, it is the combination of these factors with different weight averages for every individual. But in recent years, the discussion has taken a different turn in Turkey. In the past, many classified "brain drain" as a huge problem that needed to be reversed as soon as possible.

Policy makers, university professors, and industry leaders have been discussing how to stop the brain drain. After all, Turkey did not have many talented and well-educated individuals, and having these people leave the country to further their studies or careers elsewhere was certainly unacceptable.

Nowadays people are discussing whether it is a truly bad thing. With the latest developments in technology, globalization has allowed for partnerships across borders. This brings mobility to every market, as well as mobility in terms of employment. We see more partnerships between countries, both industrial and academic.

Turkey has been giving a big percentage of its highly trained and talented scientists and engineers to the U.S. since the 1960's. Today, it has reached a critical point. Professionals who once left Turkey are looking for ways to give back to their country by initiating these partnerships. We intend to go deeper into this topic in upcoming issues but for now we will take a closer look from an academic point of view. We had the chance to briefly ask two distinguished professors, Prof. Ahmet Palazo lu of the University of California, Davis and Prof. Ümran Onan of Stanford University, about their thoughts on brain drain, where the academic research stands in Turkey, and what more can be done for improvement. Due to their busy schedules we could not get together physically but they were very kind to spare enough time to answer our questions.

First of all, let me thank you for taking the time to answer our questions. Can you tell us a little bit about your main areas of research?

Ahmet Palazo lu: For many years, I have been developing methods to safely operate chemical processes. This involves mathematical modeling of such complex systems and a fundamental study of automatic control and monitoring activities. My research can be categorized as systems engineering since our basic approach can be applied to a variety of complex, large-scale systems. Recently, using such techniques, we have been studying the effect of climate variations on air quality to help people understand pollution dynamics and how to deal with it. I am also interested in biological systems, especially proteins and how we can model their folding behavior using sophisticated models. Such research has the potential to shed light on diseases like Alzheimer's and Parkinson's.

Ümran Onan: My research areas include Near-Earth Space Physics, Ionospheric Physics, Physics of the Earth's Radiation Belts, Electromagnetic Remote Sensing of the Space Environment, Very Low Frequency (VLF) waves and wave-particle interactions, Lightning discharges and their effects on the ionosphere and radiation belts. I have been affiliated with STAR laboratory (Space, Telecommunications and Radioscience where I served as a director in 1997.

How strong would you say Turkey is in your area of research? (Both academically, and possible industry applications)

Ahmet Palazo lu: Research in the general area of systems engineering in Turkey is somewhat limited and exists in a few universities but only those with strong research programs. As far as I know, such research is non-existent in the industry.

Ümran Onan: Unfortunately Turkey is not strong at all in my area.

There are a lot of students coming from Turkey to the United States for graduate school — what are your comments on brain drain - (both positive and negative). How can Turkey make this brain drain into a benefit?

Ahmet Palazo lu: With the emergence of foundation universities and the increased availability of research funds from TUBITAK and other agencies, the research infrastructure in Turkey has become more competitive than in the past. That creates a significant incentive both for students to stay in Turkey to get their PhD degrees and also for others who are trained abroad to go back and join academia in Turkey. Of course, more needs to be done to sustain and accelerate this trend. I don't see this so much as a drain but perhaps an opportunity. We need to have a healthy presence of Turkish academicians in US and European universities to engage in and facilitate broad/global research agendas. When balanced well, this would be a win-win situation for everyone.

Ümran Onan: Turkey can only stop the brain drain by providing the right facilities, opportunities and environment for research and technology in Turkey, so that the people who leave are motivated to return. However, brain-drain is not

necessarily a bad thing, especially when we have an abundance of universities and educated people in Turkey. The brain-drain can be turned into a positive by making sure that the people who stay abroad are well connected with the institutions in Turkey. The Turkish government and universities should encourage the appointment of people to Courtesy/Visiting positions, and should take advantage of high-level people by appointing them to Boards of Directors or Boards of Advisors of Turkish Institutions, so that their expertise can be taken advantage of.

Could you comment on industry-academia collaborations in the US and compare them to the situation in Turkey?

Ahmet Palazo lu: My perception is that US industry is more willing and able to collaborate with universities compared to their Turkish counterparts. This is also industry specific. New and emerging industries such as energy, pharmaceuticals, and computer technologies have more robust collaborations, while more traditional industries such as chemicals and pharmaceuticals tend to be less enthusiastic. The difference in this regard between Turkey and the US is also rooted in the structure and evolution of the respective industries as well their business goals and corporate objectives. Therefore, it is difficult to compare. Yet, I believe some of the recent developments in establishing techno-parks in universities could serve well to foster such collaborations in Turkey.

Ümran Onan: This is a large subject. The situation in the U.S. is quite good but is rather unique, and does not exist really even in Europe. Most industries do not understand the importance of long-term research, so their interactions with universities is often limited to mundane applications, and a desire to tap into low-cost labor (students) to do things for the company. This does not work, since creativity is only harnessed through PhD programs, and those topics are usually longer term, with no immediate interest to the companies.

Could Turkish universities set up more joint programs with US universities? Where do we stand right now, and how do you think it can be improved?

Ahmet Palazo lu: I think there is a growing world-wide trend to establish academic partnerships across borders. And several universities in Turkey have already started such partnerships with European and US universities. I am sure this will continue to grow. These could be as simple as undergraduate student exchange and dual-degree programs and also as complex as multi-national research alliances. In any partnership, the partners should offer compatible and complementary benefits and I think there are many universities in Turkey that can offer substantial assets to any such partnership. As economies become globalized, education also follows. Not only the institutions can collaborate in educating students, the students also need an education that would prepare them for such a globalized and diverse work environment. As this need is recognized, universities need to expand their reach and find suitable partners that would help them fulfill their mission.

Ümran Onan: I am not sure how much is possible here. There are very few joint programs, and I am not sure what can be done. In outstanding schools such as Stanford, it is difficult to do anything other than recruit the best students out of ODTU (METU) and Bilkent. It does not make sense for Stanford to establish relations with smaller schools, since the students from these schools often cannot be admitted to Stanford, since the bar is so high. Even from METU and Bilkent, we admit the top three or four students, but no more. In this connection, this student interaction is already happening, so I am not sure what else can be done. I think formal relationships, in terms of exchange programs etc., might be useful with other schools, but I cannot see them working for top U.S. universities such as Stanford.

Would you agree that Turkish universities have a lot to offer for collaboration? What should Turkish universities focus more on to improve education? Prof. Palazo lu, I know you have a joint program with METU (Orta dogu Teknik Universitesi). Could you comment on that program as well?

Ahmet Palazo lu: I certainly do think Turkish universities have a lot to offer. UC Davis has a long history of relations with Middle East Technical University (METU) and recently two universities signed an Agreement of Cooperation to formalize these activities. UC Davis has provided some seed funding to facilitate 6-12 month visits by METU PhD students to spend time in UC Davis research laboratories. With this program, we are building collaborations between faculty members from each campus to work on joint research projects, with the expectation that they will engage in long-term partnerships that would benefit both campuses. This is a vibrant and growing activity at the moment. We are also working to establish a joint PhD program that would allow students to spend time at both institutions as part of their education and training. We are looking at foundations and corporations in the US to see if they can partner with us to sustain and expand this partnership. METU (and other universities also) have excellent students and they need to continue to maintain this excellence. Another key ingredient of course is commitment to excellence in basic and applied research. METU has been doing that very well also. Such a vision needs to be shared by all faculties, administrators, and the students and defines the personality of that university. As more universities in Turkey buy into this model of excellence, I have no doubt that they will continue to be sought out by universities in the US for long-term partnerships.

Ümran Onan: I also think Turkish universities have a lot to offer but I also believe there is room for improvement. I think the first steps to be taken should be: appointment of the best possible professors, and encouraging those faculty to stay active in research in a competitive environment; establishing external criteria for measurement/assessment of the quality of graduates that the schools produce, and forcing their faculty and administration to rise above political bickering to appoint and promote the very best.

WHO IS ÜMRAN ONAN?

Ümran Onan received his BS (1972) and MS (1973) in Electrical Engineering from Middle East Technical University. He came to California in 1973 to obtain his PhD from Stanford University in 1977. He has been with Stanford University ever since, except for a year he spent as associate professor at Bogazici University in Istanbul (1980 to 1981). He has many publications, honors and awards, and has written two textbooks with his brother Aziz Onan (who is a professor at the University of Portland). He is currently a Professor of Electrical Engineering and the director of VFL (very low frequency) group at Stanford. His homepage can be found at <http://www-star.stanford.edu/~vlf/umran.html>

WHO IS AHMET PALAZO LU?

Ahmet Palazo lu received his BS in chemical engineering from METU in 1978 and his MS from Bogazici University in 1980. He got his PhD from Rensselaer Polytechnic Institute in Troy, New York in 1984. He joined UC Davis in 1984 as an associate professor and has been serving as Professor of Chemical Engineering and Material Science at UC Davis since 1996. He is very well published in his area of research and has had several visiting appointments to Turkey, Germany and Argentina. His homepage can be found at <http://www.chms.ucdavis.edu/faculty/palazoglu.php>
The homepage for the UC Davis - METU collaboration is at <http://ucd-metu.ucdavis.edu/>