

Graduation day

The annual graduation ceremony at most universities is a day devoted to celebrating an important point in students' lives. Examinations are finally over, scruffiness is replaced with fancy clothes and parents admire their children for reaching the finishing line of a long marathon. Most of all, it is a time of unrestrained optimism. I recently attended a graduation ceremony and although I shared the students' joy, I had some sobering thoughts. As I looked at all the smiling faces, I wondered what the future will hold for these students and what established scientists can and should do to help them.

Those who continue to study science after their undergraduate degree generally dream of becoming an academic researcher. Is that because it is the most visible career model they have encountered or because they lack guidance at this stage of their lives? Or is it because they think it is the best job imaginable? Unfortunately, undergraduates gain surprisingly little understanding of what it means to be a working scientist, in contrast to other professions, such as medicine or law. Most undergraduate courses do not allow students to experience the frustration of experiments that refuse to work or—if they do—of being scooped by another group's publication. But despite this, the image of being a scientist and the dream of making useful discoveries remain attractive. The sad fact, however, is that only a very small percentage will have the combination of skills, perseverance, luck, hard work and sacrifice necessary to achieve that goal. All the others will find satisfying—and often better paid—jobs in other sectors. If

students cannot see that on graduation day, it might be because it is a day of idealism rather than pragmatism.

While graduates throw their caps in the air—knowing that they will soon come down to earth—we should reflect on how we can help them during the next phase of their lives. Often, a Masters degree is the next step, and a variety of programmes encourages students to think a little further about their future. Some career choices outside academia become visible, which is a positive sign. However, not every choice is always available and some students do not want to stop short of a PhD in case this is disadvantageous for their future. Discussions in the European Commission point to one solution to this frequent mismatch between students' aspirations and job market realities: putting more emphasis on non-scientific training and professional skills to produce a cohort of scientists who are multifaceted and trained for jobs in academia, industry, journal editing, patent analysis and so forth.

There is merit to this, but it would mark a major change in the way scientists are trained. Taken too far, it would be detrimental to the future of science. Even if many students hang up their lab coats, not all will. Is it wise to shift the emphasis so that scientists do not benefit from the hard lessons that are implicit to research training? We tend to overlook or take for granted many of the skills taught to scientists—the intellectual honesty in including the right controls to avoid seduction by artefacts, the need to challenge the interpretation of experimental results, the importance of remaining up-to-date on the literature, the need to put results

in context—and all of these are important assets in many jobs outside the laboratory. In addition, as every demographic analysis shows that we need more qualified scientists, we should not dilute their training in primary research skills.

Having stressed the need to preserve what we have, it is nevertheless worth considering how to broaden the skills of those who do not fit well into the academic world. Every supervisor will know the PhD student who is just not the right person for a pure laboratory life but who would excel in another environment. It would be helpful if there were complementary courses that would allow them to make the transition during their PhD rather than afterwards. Unfortunately, such courses currently fit neither the standard demands for a PhD programme nor an additional postdoctorate cycle of training.

Meanwhile, back at the graduation, officials' speeches make everyone glow, students beam with self-fulfilment, parents realize that their assistance—both financial and emotional—was worthwhile, and the faculty have the satisfaction of bringing another group through the system. Freezing this moment in time has an emotional effect. Each individual on the roll call will go on to have a life of joy and pain, of positive and negative experiences. Loss, hardship and frustration will be mixed with awards, publications and job offers. The future always seems more promising than the present, and the present on graduation day is pretty good—even if it is not quite the reality.

Frank Gannon

doi:10.1038/sj.embor.7400792