Polishing Human Potential by Professional Scientific Training

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Abstract

In this article I argue that graduate students enter graduate school with unique potentials and obstacles when facing scientific life. I try to be precise and give words for those obstacles and potentials. I then offer specific ways for graduate school to deal with these obstacles by soft skill training. I also incorporate my perspective and relate to current research.

Good Sailors Getting Lost at Sea

Graduate school is where students actually enter the scientific life and often this transition from undergraduate studies is memorable to postgraduate students. Let us dive into how it feels to enter graduate school and thereby highlight the common situation of having high potential with a possibly crucial need for polishing.

For scientists at heart undergraduate school can feel like a well structured, overwhelmingly beautiful and graceful sail through the discoveries of humankind. It requires a lot of skill to be able to grasp this information and manipulate it at will. During this time, students build most of their hard-skills of expertise in a specific topic. There can also be a strong sense of satisfaction and thrill of learning so much so fast or even a sense of power from having access to the vast knowledge that was built for centuries.

Hopefully, undergraduate school fuels the passion of students to use the marvelous tools they learned to rush into the unknown and return with a beautiful discovery of their own. By doing so students will truly begin their scientific experience, and this is where textbooks, so to speak, end. Technically speaking, students at this point are well equipped to meet the scientific water. They can survive a flow of disorganized knowledge, a required skill for entering a scientific field (they don't drown), and they are trained to perform scientific work (they can row well).

Regarding soft skills (navigation at sea), since they are critical for academic success [2], graduate students who succeed well in their undergraduate studies most probably have some strong soft skills: problem solving, work ethics, teamwork, passion, and so on. These skills are not taught in academia regularly

[3] so some of them are probably lacking. Crucially, these lacking skills might be a liability when the transition to graduate school occurs. The scientific can be very unpleasant at times and very different from the appearance made in undergrad studies. This academic period can involve a strong feeling of getting lost at sea where work is loosely structured and even depression may rise, as students begin to confess publicly in recent years [7, 4]. At this point, each person starts facing their own personal mental challenges and the soft skill deficits that prevent them from expressing their potential.

Training Soft Skills - Navigating the Seas

Principle investigators (PIs) were not trained to have mentoring and nurturing skills and commonly find themselves unprepared for that task [3]. Moreover, researchers tend to be autonomous, self-driven individuals who are intrinsically motivated by their work [5]. These habits might bias them to avoid training their students for better soft skills as well. Therefore, the notion that students require external motivation or mental support could seem troubling or leave some PIs helpless. And so, the expectation that PIs polish their students' soft skills in the face of mental struggle should be partially lifted. Instead, this article suggests involving soft skill training in a structured way in graduate school.

I propose two ways to involve soft skill training in graduate school. First, graduate students should be exposed to soft skill literature, which provides valuable definitions and concepts that help them cope with their struggles in scientific life. As research on soft skills is accessible and the topics are interconnected, once students become familiar with the literature, it becomes convenient for them to find the topic that speaks to them and get almost personalized ways to develop their lacking soft skills themselves.

Second, is teaching soft skills with a specific emphasis on self-reflection. One reason is that self-reflection is an important soft skill for leaders as detailed in this Harvard Business Review paper [6]. It can therefore improve the soft skill of leading when not in charge, which is pivotal as demonstrated in the Soft Skills course I took at the Weizmann Institute of Science. The aforementioned Harvard Business Review describes the obstacles that arise from having an analytic mind and constant work pressure in terms of reaching self-reflection. It also gives a beginners' manual for self-reflection and elaborates on reasons to invest in it. It follows from this paper that self-reflection can improve decision making skills, strategy planning, and mental resilience. Personally, what I related to most in this paper is that self-reflection allows for clearing a messy mindset and for "meaning making", which can be powerful tools for a scientist when stuck in the cloud [1], for example.

Final remarks and conclusions

At the end of graduate school whether postgraduates go to industry or academia they are measured by their level of proficiency in their research. This is most commonly examined by the quantity and quality of their published articles and

by oral presentations of their work. Therefore, it makes sense to mark the goal of graduate school as giving students the tools to become professionals in their field. To aim for this goal, the graduate school curriculum should include soft skills and not only hard skills, as they are required in order to become a professional scientist [2]. It is important to add that soft skills can be learned and improved similarly to other professional skills.

This article gives a perspective on graduate school in the eyes of graduate students and their needs in the context of recent literature. It also proposes incorporating soft skill training in graduate school and relying less on PIs to perform this training, although they can immensely contribute to this effort. It offers to spread the knowledge on soft skill literature as part of the graduate school curriculum and proposes emphasizing the skill of self-reflection in relation to scientific life.

Future work could be done to check the effect of soft skill oriented training, and awareness of soft skill literature, on academic success of graduate students. This should be examined specifically in the context of academia rather than mainstream industry, for example, since implementing conclusions from mainstream research to academic life is sometimes found to be inadequate [3].

References

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