

OPINION

The “PSM Externship” — Enlarging Exposure to Science Careers in an Age of COVID Sheila Tobias and Daryl Chubin

AS THE PANDEMIC CONTINUES TO SHAKE THE CONFIDENCE OF STUDENTS, FACULTY, AND INSTITUTIONS OF HIGHER EDUCATION, many are confronting the need to revisit their expectations. COVID-induced disruptions to the pursuit of an undergraduate degree have reminded students of the cost, both financial and experiential, of returning to campus. As many as 40 percent are not likely to re-enroll (Jaschik, 2020). What is to happen to them?

COVID has imposed another burden as well, one that presents an opportunity for students to reconsider their major, their financial goals, and their career path. Specifically, alternatives to a linear progression from the baccalaureate to professional or graduate school, and even from traditional disciplines to hybrid programs should be, if they are not already, entertained. In the hierarchy of academic credentials, the baccalaureate is the gateway to a science career.

Meeting the Challenge

Due especially to Sloan’s investment (Carpenter, 2012; Teitelbaum, 2006) and the endorsements of the Council of Graduate Schools and the National Research Council, the Professional Science Master’s grew—exponentially first in PhD-granting, and later in Master’s-granting institutions—to 300 in 2014 (Tobias and Strausbaugh, 2018). Required for entry was a bonafide four-year degree in a STEM field and an interest in pursuing a wider range of employment options than just research. To date, over 10,000 (Tobias and Strausbaugh, 2018) PSM graduates have entered the US workforce.

As the National Professional Science Master’s Association (NPSMA) explains, the four components common to PSM programs—disciplinary and

interdisciplinary knowledge, professional competencies, foundational and transferable skills, and research—graduate “professionals who are workforce-ready without compromising scientific expertise” (Strausbaugh, 2019).

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What was new two decades ago is arguably still competitive: a market-driven course of study meant to impart a skill set, a credential, and a competitive advantage. In today’s environment, STEM undergraduate students struggling with partially closed campuses, and more and more uncertain and undefined futures, deserve to be apprised of both alternate career paths in STEM and exposed to companies, agencies, and PSM alumni who are pursuing those options. History repeats: as the National Research Council (2008) affirmed over a decade ago, master's programs support educational and career goals, and master's level professionals in the natural sciences indeed contribute in the workplace.

With institutions of higher education today adapting their business models to increase their online offerings (Seltzer, 2020), and non-degree credentials (e.g., certificates earned in months, not years) gaining appeal during the pandemic (Fain, 2020), the potential appeal to students who “stop out” during their undergraduate experience

(typically due to financial strain) becomes more urgent. An undergraduate PSM experience is one disruption that should be welcomed.

PSM Externship as Career Exposure

A PSM externship, configured at the advanced undergraduate level, would serve as a scholarship that retains students on a science-based career path instead of losing them temporarily, if not permanently, from the workforce. The cost of the student externship would vary with the “work” and “work setting,” but include separate stipends for faculty and workforce advisers. Each PSM’s Workforce Advisory Board could assist in identifying and negotiating sources of funding support.

Our inquiries suggest that many PSMs could serve as pilot sites for the undergraduate curricular experimentation we envision. A leading candidate is New Jersey, both for the size of its state university and the range/variety of the 33 master’s PSM programs (and faculty) located and long-established at Rutgers University (e.g., the Masters of Science and Business, <https://mbs.rutgers.edu/>). A multitude of other states are also attractive, notably the 19 PSM programs in Florida (Florida State, Miami, South Florida, Central Florida, Florida Atlantic, Florida International, and West Florida. Other robust clusters (should the experiment succeed and other sponsors wish to replicate) are: New York, Pennsylvania, North Carolina, Ohio, and Massachusetts, which collectively host over 125 programs (<https://www.professionalsciencemasters.org/psm-programs-state>).

These potential sites are favored not just for having in place mature PSM programs in a wide variety of fields, but also because Census data indicate a robust pool of minority student talent under-accessed by most science programs nationally. These states also have a rich supply of employment possibilities for their externs and their graduates, e.g., New Jersey with its dominant petrochemical and pharmaceutical industries, and Florida with its marine and agricultural industries.

Next Steps

COVID presents challenges and an opportunity: as a disruptor, it jars once again our recognition that students depart science as undergraduates for reasons unrelated to their ability or interest. Life

intrudes. Alternatives to the conventional path remain obscure. The proposal sketched here is founded on a model of professional education that extends and enlarges the applications of science.

Just as the PSM was initially framed—“a fundamentally different option tailored to the student who is more career-oriented and seeks knowledge of, and acclimatization to, the workforce environment” (Strausbaugh, 2019)—today we must adapt knowledge and skills to a variety of workplaces that are not campus-based. Virtual tools, now necessarily embraced due to the pandemic, will become a common delivery mechanism to support students with science aspirations not limited to research alone.

If enlarging the contributions of science-based professionals to the US workforce is more than rhetoric about credentials, then the time is right, once again, for PSM-like programs to supply the country (if not the world) with this unique human resource. If not NPSMA to lead the way, then who?

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