



Department of Biochemistry,  
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## BMI Teaching Trends Newsletter – September 2021

### Teaching Matters

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#### Role of Master's Education in the Sciences

Inside Higher Ed recently hosted a [New Models of the Master's Degree event](#) for 200 graduate school administrators and faculty with the aim of defining the evolving role that the MS degree offers. This group considered the discussion point: can traditional postbaccalaureate learning stay relevant? A motivation for this event is a 21<sup>st</sup> century job market that is pushing college graduates toward credentials beyond the bachelor's degree at a time when the rising cost of a traditional post-graduate degree can obviate long-term earnings. Winners in this market have been for-profit companies that offer short-term, online courses leading to focused certifications. Progressive universities share in this new source of educational revenue developing affiliations with these companies. The prestige of a faculty member (or adjunct) from a well-known university partnered with an online provider that manages the production and distribution of the content has been a highly successful model for companies such as [Coursera](#). The University of Pennsylvania's Wharton School of Business has developed a unique opportunity by partnering with Coursera to provide stackable specializations. Several thousand students have completed the series with substantial earnings to the university.

There is a continued interest from degree-seekers and employers in the advanced skills offered by the master's degree. The share of the U.S. population with an advanced degree has increased from 5% in 1980 to 13% today. From a [historical perspective](#) during the 1949-50 academic year, about 58,180 master's degrees were awarded to students, with the vast majority being earned by male students. In the 2018-19 academic year, this figure increased to about 833,710 master's degrees awarded, with the majority being earned by female students. Employers increasingly seek master's-level credentials but the rising cost of higher education begs the question - is it worth it? Although a March, 2020 [survey](#) of employers showed a substantial earning difference in business administration and computer science for those holding a master's degree (see figure), a meaningful return on the investment is not always guaranteed. There are a number of shorter-term alternatives being offered by companies such as Google such as focused certifications, coding bootcamps, and [micro-credentials](#) that give workers who are seeking to reskill some alternatives to the traditional master's degree. However, employers have not universally embraced other degree alternatives. Currently, only ~20% of employers accept micro-credentials on an applicant's resumé.

**Figure 1: Salary Differential Between Bachelor's and Master's Degrees**

Major	Average Starting Salary by Degree Level		Differential
	Bachelor's Degree	Master's Degree	
Business administration	\$58,166	\$79,043	\$20,877
Computer science	\$68,668	\$80,142	\$11,474

[Sean Gallagher](#), executive director of the Center for the Future of Higher Education and Talent Strategy at Northeastern University, presented an interesting prediction at the at the New Models of the Master's Degree event. He posited that the future of the master's degree might come to mirror the record industry. Specifically, there is increased demand for the advanced degree but by analogy to the music industry where the demand has been met by streaming services, online education businesses will reap the profits. In essence, the traditional degree-granting institutions may go the way of the compact disc during a time when for-profit online management companies could gain a greater slice of the post-baccalaureate pie. James Hilton, Vice Provost for Academic Innovation at the University of Michigan, presented his outlook at the Master's Degree event. He emphasized that universities looking to innovate should not simply repurpose their existing degree programs as online offerings. Deeper thought is needed, imagining how instructional transformation is warranted and a wider range of credential offerings to serve different groups of students should be considered. Higher education faces currently faces a challenge of better communication.

But what will the future hold and can there ever be an alternative to the master's degree in the sciences? Certifications reflecting acquisition of a particular skill are a viable option for our graduate students but simply learning a technical skill can never substitute for a research-based master's degree with the successful defense of a thesis. The rigors of graduate-level coursework and the successful completion of hypothesis-driven research project instills the critical thinking and problem-solving skills that drive innovation that is highly valued in any field. Another important consideration is the role of the master's degree has in bridging the pursuit of the doctoral degree for many students. The challenge is to develop a cost-effective model that will permit science students to earn postbaccalaureate course credits in a new way and still engage in the traditional apprenticeship model that provides the essential element of independent research and peer evaluation.

This topic, the value of the master's degree in a science, technology, engineering, and math (STEM) field, is being explored at the national level. Two weeks ago, the Council of Graduate Schools (CGS) [announced](#) grant funding from The National Science Foundation (NSF) for a project that will explore the role of master's education in preparing, upskilling, and reskilling the STEM workforce. Recent Bureau of Labor Statistics data reveal that many of the fastest-growing fields will require master's degrees, but little information exists about how master's education may support STEM careers. An RFP will go out in the fall of this year with the aim of selecting 10 CGS institutions for an exit survey of masters degreed students who are seeking employment or advance degree opportunities. A goal of this NSF award to the CGS is to help graduate-degree granting programs decide how to better align their curricula with 21<sup>st</sup> century expectations in STEM fields.