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Op-ed: Meeting the Workforce Needs of the Life Science Industry Isn't Just About Teaching Science



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A December [report](#) from the MassBioEd Foundation called attention, once again, to the fact that the pipeline of students graduating with degrees in science technology, engineering, and mathematics (STEM) fields is inadequate to meet the workforce needs of the life science industry. The report notes that, while there has been some success in attracting more students to STEM education, the demand for such graduates just keeps growing.

Why is there a disconnect? It's not hard to interest young people in science and technology. Just visit the Museum of Science and watch the enthusiasm engendered by the Discovery Center, dinosaurs, and the Hall of Human Life. This interest in science persists into post-secondary education, where the number of students who initially chose to major in STEM fields is more than sufficient to meet the workforce needs of the industry.

The problem is that only a small fraction of the students who initially choose STEM majors will ultimately work in STEM occupations. Focusing specifically on the life sciences, [evidence](#) suggests that, while 11% of undergraduate students initially choose majors in the life sciences, only 6.6% will complete first degrees in "biology, agricultural, and environmental sciences," and only 15% of these graduates will ultimately work in STEM occupations, a fraction that is insufficient to meet the needs of the life science industry.

Evidence also suggests that the majority of the students who leave STEM fields move towards business. Up to a quarter of those who leave STEM majors chose to major in business, and 37% of STEM graduates ultimately work in business occupations.

It's not hard to understand why students are attracted to business. With increasing concern about the cost and return on investment of a college education, careers in business are considered lucrative and attractive. However, if students are drawn to business due to economic concerns, then why aren't more students who are interested in STEM subjects choosing to complete these majors and work in the life science industry, given the many employment opportunities and high salaries in this sector?

We believe the problem is that biology education is failing to communicate the connection between the biological sciences and opportunities in industry.

In a recent [paper](#), written with colleagues and students at Bentley University, we observed that introductory college biology textbooks broadly failed to describe how biology applies to industry or opportunities for applying STEM learning in business careers. Moreover, these textbooks overwhelmingly portrayed business in a negative light, emphasizing corporate practices that compromise human health or the environment, and selectively highlighting unethical practices.

This negative representation of industry implicitly leaves students with having to make a choice between science and business. For students who are interested in science, but also tempted by business, this may induce them to abandon their STEM majors, thus reducing the pool of students in the pipeline of STEM professionals.

Without minimizing the real conflicts that exist between science and industry related to unsustainable practices, high drug prices, and efforts by "big tobacco," "big oil," and "big food" to undercut scientific evidence, depicting science and business as adversaries disregards the even stronger synergies. Portraying business as antithetical to science ignores the essential role business plays in translating scientific discoveries into products that benefit the public. Moreover, it dismisses the large numbers of STEM graduates who find fulfilling, well-paying careers in industrial research & development, production, business development, management, marketing, or finance.

The workforce needs of the life science industry are not being met by cultivating a singular interest in science, but rather require strategies that appeal to students with interests that span both science and business. Such students may be convinced to complete their STEM education and enter careers in life science by teaching scientific concepts in the context of their potential application to real-world problems, through case studies of product or process innovation, by presenting role models of scientists working in industry as well as academia, and by exploring how scientific approaches can improve the practice of business. Such pedagogies could improve student [motivation](#), [achievement](#), and [persistence](#) in STEM courses by helping students appreciate the value of science on their life path.

We are not proposing that STEM education should promote careers in business. Rather, we propose that STEM educators need to recognize that the majority of students who enroll in science courses will ultimately pursue careers in business; therefore, it makes sense to offer teaching that connects science to career opportunities. In doing so, science educators may enable more students to graduate with scientific skills that they can apply in their personal, professional, and civic life.

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