



Invited Letter: By Implementing Key Strategies and Providing Necessary Support for Students, Community Colleges Can Better Support Undergraduate Research

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Hello, my name is Dr. Dominic Salerno and I have served as an assistant professor in the biology department at The Community College of Philadelphia for 12 years. As an instructor, researcher, and vocational training coordinator, my role here contributes to student learning, research, and developing careers in the life sciences. As a professor of microbiology and cell/molecular biology, I attempt to foster a dynamic learning environment with courses that integrate theoretical knowledge with real-world applications. I passionately believe in the value of research-based learning and training for my students. I encourage them to engage in research projects that align with their interests and the fields they desire to work in. Our regional and national partnerships provide technical training through the biomedical technician training program and via original research projects conducted at CCP. I facilitate opportunities for students to participate in meaningful research experiences that enhance their understanding of the life sciences and equips them with the technical skills needed to work in the field.

Working with students in undergraduate research has been an incredibly rewarding experience. I have had the privilege of witnessing students transform from curious learners to confident researchers and observed the numerous ways they have benefited from research experiences. One of the most exciting aspects of undergraduate research is witnessing my students' curiosity ignite. One student who initially seemed reserved became captivated by a research project exploring microbial diversity in the Delaware River Watershed. As the project progressed, their enthusiasm grew, and they started asking questions that pushed their project's boundaries. Their input helped me create a project more sophisticated than I had originally envisioned, and helped the student obtain a prestigious summer URE and pursuing a degree in marine biology. Students have also benefitted through developing critical thinking skills. Initially, many students in our research group were tentative about their ability to conduct research. However, through skills workshops, perseverance, and collaboration with peers, they successfully overcame obstacles in their project, improving their experimental design and generating high-quality data. This experience taught them that setbacks are an inherent part of research and can lead to valuable insights. To overcome these hurdles, students had to think critically about scientific literature and their experiments. This experience honed their analytical skills and highlighted the importance of experiential learning/training.

Community colleges can better support undergraduate research by implementing key strategies and providing necessary support for students. Strategically, community colleges can do a much better job by creating a culture that values and promotes research at the community college rather than focusing solely on instruction and transfer. This might include organizing research seminars and events highlighting student and faculty research projects. This must feature accessible, faculty-mentored research opportunities that enhance learning while promoting technical training and degree completion. Embedding research into the curriculum will better integrate theory and practical skills, leading to employment while not disrupting degree completion. Furthermore, faculty and community colleges need to invest in research and create pathways for students to engage in research over multiple semesters or years so students will delve deeper into their research and make more meaningful contributions. Finally, these programs must foster an inclusive and welcoming environment where students from diverse backgrounds feel comfortable participating in research, and support services should be available to accommodate their different learning styles and needs.

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