60-Second SoTL

Episode 67 – Multi-Semester Undergraduate Research Experiences

Featured Article

Colclasure, Blake C., and Tyler Granberry. 2025. "Challenges and Supports Experienced by Students Completing a Multi-Semester Capstone Undergraduate Research Experience: Reflections from Program Graduates." *Teaching and Learning Inquiry* 13 (December): 1–17. https://doi.org/10.20343/teachlearninqu.13.57.

Transcript

(Music)

0:08

Jessie L. Moore:
What challenges do students encounter in a multi-semester, capstone undergraduate research experience, and what supports do they need to navigate those challenges? That's the focus of this week's 60-second SoTL from Elon University's Center for Engaged Learning. I'm Jessie Moore.

(Music)

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In "Challenges and Supports Experienced by Students Completing a Multi-Semester Capstone Research Experience: Reflections from Program Graduates," Blake Colclasure and Tyler Granberry examine graduates' reflections on a three-semester capstone research sequence. Their article appears in *Teaching & Learning Inquiry*, an open access journal.

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The authors focused on an undergraduate research experience sequence at a small liberal arts university in the United States. Students majoring in biology, biochemistry, chemistry, or environmental science take a sequence of three research courses in their third and fourth years of study. The first course supports students' identification of a research topic and a faculty mentor, as well as their development of their research design. The second and third courses are variable credit—two- to four-credit hours—as students conduct their research with mentorship from their faculty research advisor. Students present their research at the university's undergraduate research symposium and write a thesis.

In essence, this model pairs a course-based undergraduate research experience with credit-bearing, independent research experiences over at least three semesters. Although the authors don't explicitly invoke signature work

literature, I suspect that the combination of student agency and sustained inquiry result in learning experiences that might align with the core characteristics of signature work.

1:57

As part of a larger research project about the STEM experience, the authors sought to understand the challenges students encountered during a three-semester, course-supported undergraduate research experience, and what supports and resources the students used while completing the experience. The authors used a qualitative, hermeneutical phenomenology research approach and interviewed 16 graduates who had earned undergraduate degrees between 2016 and 2020. Their semi-structured interviews were guided by 35 open-ended questions, which the authors share as an appendix to the article.

The researchers completed inductive coding using MaxQDA software and used transcripts of 4 of the interviews to establish intercoder reliability before coding the remaining interview transcripts. The researchers also conducted member-checking with each participant.

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In terms of challenges the students encountered, the study highlights three themes:

1. Participants noted that the three-semester undergraduate research experience required a significant time commitment, with one graduate describing it as like a part-time job.
2. Participants had to navigate that significant time commitment alongside other coursework and additional responsibilities, including holding actual part-time jobs, leading student organizations, and competing as college athletes.
3. Like most researchers, participants encountered unanticipated research problems and had to learn how to navigate them.

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In terms of supports and resources students used, the authors focus on five themes:

1. Students drew on prior coursework or supplemental experiences that prepared them to manage their capstone research.
2. Research advisors provided critical support, not only for the undergraduate research project, but also for the student as a holistic person.
3. Beyond their research advisors, students drew on a constellation of relationships with other faculty, library staff, and industry professionals to support their research.
4. Peers also provided support, both as co-navigators of the capstone research experience and as assistants for research steps that required multiple people.
5. Participants also acknowledged space and material needs, noting that their departments generally met these needs but also recounting challenging processes for procuring supplies.

Notably, graduates viewed these challenges as meaningful learning experiences, helping them develop problem-solving skills, resilience, and a more authentic understanding of scientific work.

4:36

For SoTL scholars and educators, this study reinforces the importance of intentional scaffolding, realistic expectations, community building, and sustained mentoring when designing multi-semester capstone undergraduate research experiences. For listeners interested in adapting this capstone experience, I encourage you to read this study alongside scholarship on signature work, capstone experiences, and the salient practices of undergraduate research mentors, and in the episode notes, I'll link to some starting points for exploring those engaged learning experiences.

To learn more about this study, visit our show notes for a link to the open access article.

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(Music)

5:19

Jessie L. Moore:
Join us for our next episode of 60-second SoTL from Elon University's Center for Engaged Learning for another snapshot of recent scholarship of teaching and learning. Learn more about the Center at www.CenterForEngagedLearning.org.

(Music)