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Empowering Inquiry: Understanding Undergraduate Research at Community Colleges

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Introduction

Community colleges serve as a foundational access point to higher education for diverse and often underserved student populations. Increasingly, these institutions are recognizing the potential power of undergraduate research (UGR) as an educational practice.[1,2] Although traditionally associated with four-year universities, UGR is gaining momentum in community colleges due to its positive effects on student engagement, retention, and equity. However, meaningful undergraduate research experiences can be difficult to implement, time-consuming, and expensive. This brief explores how integrating undergraduate research into the community college experience can support student success and institutional goals, providing models and strategies that practitioners can implement at scale.

The Value of Undergraduate Research at Community College

Undergraduate research is more than a high-level academic exercise; it can be a transformative learning experience that supports critical thinking, problem-solving, and academic identity

[1] Ashcroft, J., Jaramillo, V., Blatti, J., Guan, S. A., Bui, A., Villasenor, V., Adamian, A., Chavira, G., Saetermoe, C., Le, E., Horowitz, B., Palacios, B., Williams, P. B., Brockman, E., & Moses, J. (2021). BUILDing equity in STEM: A collaborative undergraduate research program to increase achievement of underserved community college students. Scholarship and Practice of Undergraduate Research, 4(3), 47–58. https://doi.org/10.18833/spur/4/3/11

[2] Haeger, H., Bueno, E. H., & Sedlacek, Q. (2024). Participation in undergraduate research reduces equity gaps in STEM graduation rates. CBE—Life Sciences Education, 23(1), ar6. https://doi.org/10.1187/cbe.22-03-0061

development.[3,4] For community college students, many of whom are first-generation, working adults, or from historically marginalized backgrounds, participating in UGR enhances their confidence and sense of belonging in academia.[5] Research opportunities also help students envision themselves as scholars and professionals, motivating them to persist in their educational and career paths.[6] Moreover, UGR aligns with broader institutional goals such as improved transfer readiness, increased graduation rates, and a more equitable learning environment.

In the book Undergraduate Research at Community Colleges: Equity, Discovery, and Innovation, Hensel[7] emphasizes that UGR is not only feasible but vital in the community college context. The book argues that UGR serves as a high-impact educational practice that significantly enhances student learning, engagement, and retention, particularly for first-generation, low-income, and underrepresented students. By participating in research, community college students develop critical thinking skills, gain confidence in their academic abilities, and form a stronger sense of identity as scholars. Hensel[8] illustrates how UGR helps bridge the opportunity gap by providing meaningful, real-world learning experiences that are often reserved for students at four-year institutions. The book further underscores that UGR at community colleges promotes equity by making high-level academic inquiry accessible to a broader, more diverse student population, thereby advancing institutional goals around inclusion, student success, and workforce preparation.

Similarly, Ashcroft et al.[9] focuses on the social and structural barriers that community college students often face, such as limited access to research opportunities, lack of role models in STEM, and systemic inequities. Undergraduate research programs address these barriers by embedding UGR within a broader framework of culturally responsive education and mentorship through the Building Infrastructure Leading to Diversity: Promoting Opportunities for Diversity in Education and Research (BUILD PODER) Program. The article also provides compelling evidence of impact: high transfer and graduation rates, and a notable percentage of students

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[3] Groover, R. S. (2010). A model for the implementation and engagement of independent research by community college students. www.cur.org

[4] Patton, M. H., & Hause, E. (2020). Community college undergraduate research experience summit proceedings report. American Association of Community Colleges

[5] Ashcroft et al., BUILDing equity in STEM.

[6] Haeger et al., Participation in undergraduate research.

[7] Hensel, N. H. (2021). Undergraduate research at community colleges: Equity, discovery, and innovation. Stylus Publishing.

[8] Ibid.

[9] Ashcroft et al., BUILDing equity in STEM.

entering graduate school, illustrating that UGR can close achievement gaps and support long-term educational goals. The BUILD PODER program demonstrated that 87.5% of participants graduated with a bachelor's degree, surpassing the average graduation rates for students in similar fields at California State University, Northridge. Additionally, 56% of these students enrolled in graduate school, highlighting the program's effectiveness in fostering long-term educational aspirations.

Ultimately, this piece underscores that UGR is not just an academic enrichment tool, it can be a mechanism for equity, empowerment, and transformation in community colleges. It advocates for institutional commitment to partnerships, resources, and pedagogical practices that make undergraduate research accessible to all students, not just those at four-year institutions.

Benefits for Students, Faculty, and Institutions

For Students:

Participating in research fosters curiosity, builds technical and analytical skills, and strengthens academic identity in students.[10] These experiences can be particularly empowering for underserved students, helping to close equity gaps in STEM, transfer into four-year institutions, and other fields.[11,12]

For Faculty:

Faculty who mentor student research report increased engagement with their disciplines and stronger connections with students.[13] Integrating research into teaching also allows faculty to innovate pedagogically.

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[10] Patton and Hause, Community college undergraduate research experience.

[11] Chamely-Wiik, D., Frazier, E., Meerof, D., Merritt, J., Johnson, J., Kwochka, W. R., Morrison-Shetlar, A. I., Aldarondo-Jeffries, M., & Schneider, K. R. (2021). Undergraduate research communities for transfer students: A retention model based on factors that most influence student success. Journal of the Scholarship of Teaching and Learning, 21(1), 193–224. https://doi.org/10.14434/josotl.v21i1.30273

[12] Haeger et al., Participation in undergraduate research.

[13] Baker, V. L., McCaffrey, V., & Manning, C. E. (2022). Fostering professional development through undergraduate research: supporting faculty mentors and student researchers. Mentoring & Tutoring: Partnership in Learning, 30(2), 216-234

For Institutions:

Emphasizing UGR enhances the institution's profile, supports grant acquisition, and meets strategic goals around equity and student success.[14]

Implementation Models and Strategies

- **Course-based Undergraduate Research Experiences (CURES) Curricular Integration:** Embedding research into existing courses—such as general education, honors, and capstone classes—makes UGR accessible to more students. Scaffolded assignments and inquiry-based learning models can gradually introduce students to research.[15]

- **Faculty Development:** Support for faculty through professional development, course release, and collaborative teaching models is essential. Faculty communities of practice can foster shared learning and innovation.[16]

- **Resource Infrastructure:** Whereas community colleges may lack traditional research labs, they can leverage libraries, makerspaces, and virtual tools. Hosting research symposia or digital showcases allows students to share their work publicly.[17,18]

- **Partnerships and Pipelines:** Collaborations with universities, industries, and nonprofits provide students with expanded research opportunities and clear transfer or career pathways.[19]

Addressing Challenges and Building Support

Barriers to UGR in community colleges include limited time, funding, and infrastructure. Faculty may face high teaching loads, and students may have competing responsibilities outside of

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[14] Hensel, Undergraduate research at community college.
[15] Schuster, M. (2018). Undergraduate research at two-year community colleges. Journal of Political Science Education, 14(2), 276-280.
[16] Patton and Hause, Community college undergraduate research experience.
[17] Ashcroft et al., BUILDing equity in STEM.
[18] Groover, A model for the implementation and engagement.
[19] Schuster., Undergraduate research at two-year community colleges.

school. A critical but often overlooked challenge is faculty engagement with current research in their disciplines. Community college faculty may lack the time or institutional incentives to maintain active research agendas, which can make it difficult to identify authentic research questions and mentor students effectively. However, faculty do not need to be actively conducting original research to facilitate meaningful undergraduate research experiences. Many disciplinary societies and organizations provide ready-made resources specifically designed for course-based research projects. Some solutions may include:

- Scaling UGR through group or class-based projects, particularly capstone courses or CUREs
- Connecting Faculty to disciplinary societies and professional organizations that provide course-based research
- Offering stipends or course credit to incentivize participation
- Leveraging technology-based design competitions and challenges that provide structured research experiences
- Building internal and external funding streams
- Using virtual or remote research options to increase access

Programs such as the Community College Undergraduate Research Initiative (CCURI)[20] and institution-specific efforts demonstrate that even modest investments can yield meaningful results such as increased interest in research, transfer aspirations, and pursing STEM careers.[21,22] Additional resources for faculty development and implementation include AAC&U's publications on high-impact practices,[23] which provide comprehensive frameworks and bibliographies on undergraduate research,[24] as well as resources on integrating research with global learning contexts that may resonate with diverse community college populations.

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[20] Whitehead, D., Vandermaas-Peeler, M., Sutton, S., Price, M., Patch, K., Acheson, K., & Cruz, L. (2024). Mentored undergraduate research in global contexts: integrated high-impact practices for student success. American Association of Colleges and Universities. https://www.aacu.org/publication/mentored-undergraduate-research-in-global-contexts-integrated-high-impact-practices-for-student-success

[21] Ibid.

[22] Hensel, Undergraduate research at community college.

[23] Association of American Colleges & Universities. (2024). Mentored undergraduate research in global contexts: Integrated high-impact practices for student success. https://www.aacu.org/publication/mentored-undergraduate-research-in-global-contexts-integrated-high-impact-practices-for-student-success

[24] Brownell, J. E., & Swaner, L. E. (2010). Five high-impact practices: Research on learning outcomes, completion, and quality. Association of American Colleges & Universities. https://www.aacu.org/publication/five-high-impact-practices

Conclusion and Recommendations

Community colleges are uniquely positioned to democratize undergraduate research and ensure that high-impact educational practices reach all students. By embedding UGR into the curriculum, investing in faculty mentorship, and developing creative partnerships, colleges can transform student experiences and outcomes. Institutional leaders, faculty, and staff should champion these efforts not only as a means to improve academic performance but as a critical strategy for equity.

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