Undergraduate Research

Importance, Benefits, and Challenges

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Course Details

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Agenda

- Undergrad Research: What? Why? How?
- Importance
- Benefits
- Challenges

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Introduction

What Is Undergraduate Research?

The nonprofit Council on Undergraduate Research defines undergraduate research as *"an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline."* But what an undergraduate research program looks like can vary, taking many forms and methods across disciplines[*].

[*] Petrella, J. K., & Jung, A. P. (2008). Undergraduate research: Importance, benefits, and challenges. International Journal of Exercise Science

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Importance

Does Research have an Appropriate Place in the Undergraduate Curriculum?

- Many published findings, suggest that developing and maintaining undergraduate research benefits the students, the faculty mentors, the university or institution, and eventually society at large[1].
- Additionally, the scientific community places increasing importance on research performed at primarily undergraduate institutions[2].
- Since 1978, the Council on Undergraduate Research has promoted research opportunities for faculty and students at predominantly undergraduate institutions[2].

[1] Petrella, J. K., & Jung, A. P. (2008). Undergraduate research: Importance, benefits, and challenges. International Journal of Exercise Science

[2] http://www.cur.org/

5 Reasons Why Undergraduates Should Do Research

- Developing Mentoring Relationships
- Making a Big Campus Feel Smaller
- Changing your Perspective on Ignorance and Failure
- Cultivating an Understanding of Research Design and Methodology
- Developing a Range of Transferable Skills
- Exploring Career and Graduate Education Options

Developing Mentoring Relationships

- Mentors play a critically important role in students' research and creative experiences, challenging students to try new things and offering a window onto the thinking of an experienced researcher or practitioner.

- A mentor who knows you well can advise you about your undergraduate career and your next steps after graduation; s/he will also be able to write a more detailed letter of recommendation than a professor who knows you only in a classroom context.

Making a Big Campus Feel Smaller

- Participation in research, scholarship, or creative activity can help you find your niche on campus.
- The close relationships that are developed through sustained work together give a sense of community to research groups, labs, and teams.

Changing your Perspective on Ignorance and Failure

- Scholarly inquiry has a way of putting all that you do not know into stark relief, while rarely working quite as expected.
- As you learn to think like a researcher, you begin to see ignorance and failure not as personal shortcomings but as opportunities to ask questions, reframe problems, and try new approaches.

Cultivating an Understanding of Research Design and Methodology

Hands-on experience conducting original research supports students' understanding of how to design investigations, how to make appropriate methodological choices, and how to implement different techniques and methods.

Developing a Range of Transferable Skills

While some of your learning will be research-specific, undergraduate research also develops transferable skills with broad application, including critical thinking, problem solving, communication, collaboration, and independence.

Exploring Career and Graduate Education Options

Undergraduate research and creative activity offer students opportunities to gain hands-on experience in fields of interest to them. This experience often prompts realizations about what kinds of work students enjoy most and what career paths they wish to pursue.

Why Undergrad Research?

Undergraduate students who completed a mentored research program identified multiple areas from which they benefited. Of interest to us as advisors of an undergraduate research curriculum were the following items, which were reported as being positively impacted by the research experience[1].

- Understanding the research process
- Understanding how scientists work on problems
- Learning lab techniques
- Developing skills in the interpretation of results
- The ability to analyze data
- The ability to integrate theory and practice

[1] Petrella, J. K., & Jung, A. P. (2008). Undergraduate research: Importance, benefits, and challenges. International Journal of Exercise Science

Why Undergrad Research?

However, participation in an undergraduate research experience also benefited students in areas that can reach beyond academia[1].

- Having tolerance for obstacles
- Learning to work independently
- Understanding how knowledge is constructed
- Self confidence
- Understanding that assertions require supporting evidence
- Clarification of a career path

These benefits persisted after a 9-month follow-up survey, suggesting some lasting changes in undergraduates' perceptions of the value of research.

[1] Petrella, J. K., & Jung, A. P. (2008). Undergraduate research: Importance, benefits, and challenges. International Journal of Exercise Science

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Benefits

How does Undergraduate Researcher Experience Benefit the Students?

- There are numerous benefits for undergraduate students who get involved in research.
- Research experience allows undergraduate students to better understand published works, learn to balance collaborative and individual work, determine an area of interest, and jump start their careers as researchers.
- Through exposure to research as undergraduates, many students discover their passion for research and continue on to graduate studies and faculty positions.

[*] The Benefits of Undergraduate Research: The Student's Perspective

How the Adviser / Mentor Should Engage Undergraduates?

- Awareness is first and foremost the key to success in engaging the undergraduate student.
- Academic advisers need to be aware of their students' potential interest in research as a career, as a work-experience opportunity, or in the classroom.
- The adviser can intermittently gauge interest in research during students' meetings, and when necessary, provide the right guidance about getting involved.

[*] The Benefits of Undergraduate Research: The Student's Perspective

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Challenges

Challenges of Undergrad Research

- Conducting undergraduate research is not without its challenges, though, and each challenge offered an occasion to further the student's research know-how
- Time is another challenge to overcome with getting the students up to speed and conducting experiments.
- They have to maintain good academic standing, so they have to exercise effective time management.
- Time is also a consideration for the research advisor.
- Lastly, the pacing of content can be an issue for undergraduate research; too slow, and they can get bored or disinterested; too fast, and it can seem like too much and they may become overwhelmed or disinterested[*].

[*] Bass, Patrick, et al. "Benefits and Challenges of Undergraduate Research." Proceedingsin the 2018 ASEE Southeastern Conference. 2018.

Conclusion

- Undergraduate research provides a way for the students to gain exposure and experience in their chosen field of study and offers a way for their research advisers to excite the students into wanting to know more.
- The students bring fresh eyes and new perspectives to the research process and their insight can be hugely beneficial to improving an advisers research methodology

Thank You

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