

Research as a High Impact Practice

MT Engage Summer Institute

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What are the Benefits of Undergraduate Research?

From <https://mtsu.edu/urc/index.php>

- ▶ Enhances student learning through mentoring relationships with faculty
- ▶ Increases retention and graduation in academic programs
- ▶ Increases enrollment in graduate education and provides effective career preparation
- ▶ Develops critical thinking, creativity, problem solving, and intellectual independence
- ▶ Develops an understanding of research methodology
- ▶ Promotes an innovation-oriented culture
- ▶ Strengthens students' content knowledge, research skills, and soft skills that employers and graduate schools value

Research as a High Impact Practice

- ▶ From the AAC&U HIP Table:

Undergraduate Research

Many colleges and universities are now providing research experiences for students in all disciplines. Undergraduate research, however, has been most prominently used in science disciplines. With strong support from the National Science Foundation and the research community, scientists are reshaping their courses to connect key concepts and questions with students' early and active involvement in systematic investigation and research. The goal is to involve students with actively contested questions, empirical observation, cutting-edge technologies, and the sense of excitement that comes from working to answer important questions.

- ▶ https://www.aacu.org/sites/default/files/files/LEAP/HIP_tables.pdf

Getting Undergraduate Students Involved in Research: A Few Ideas

1. Add a research component to an EXL and/or MT Engage course
2. Develop a new research course in your department for MT Engage
3. Designate an existing research course as MT Engage
4. Encourage students to apply for URECA grants
5. Encourage students to complete an Honors thesis through the Honors College (Honors College - Undergraduate Fellowship Office)
6. Learn from others in your program (talk with faculty in your program, ask ORSP for grant-active faculty in your program, & talk with presenters during the Fall Open House and Scholars Week about their experiences with research)
7. Encourage students to apply for outside research opportunities, including internships and fellowships

The Undergraduate Research Center

The URC was created in 2004 to promote undergraduate research

1. Awards URECA grants 3 times a year
 - ▶ early Fall (for Fall semester), early Spring (for Spring semester), & late Spring (for Summer)
 2. Awards travel funds for undergraduates to present their research at academic conferences
 3. Sponsors research events: Summer Research Celebration, Fall Open House, Posters at the Capitol, Scholars Week, & Undergraduate Research Week
- Other services: poster printing
 - SOAR: Student Organization for the Advancement of Research

<https://mtsu.edu/urc/index.php>

What are URECA Grants?

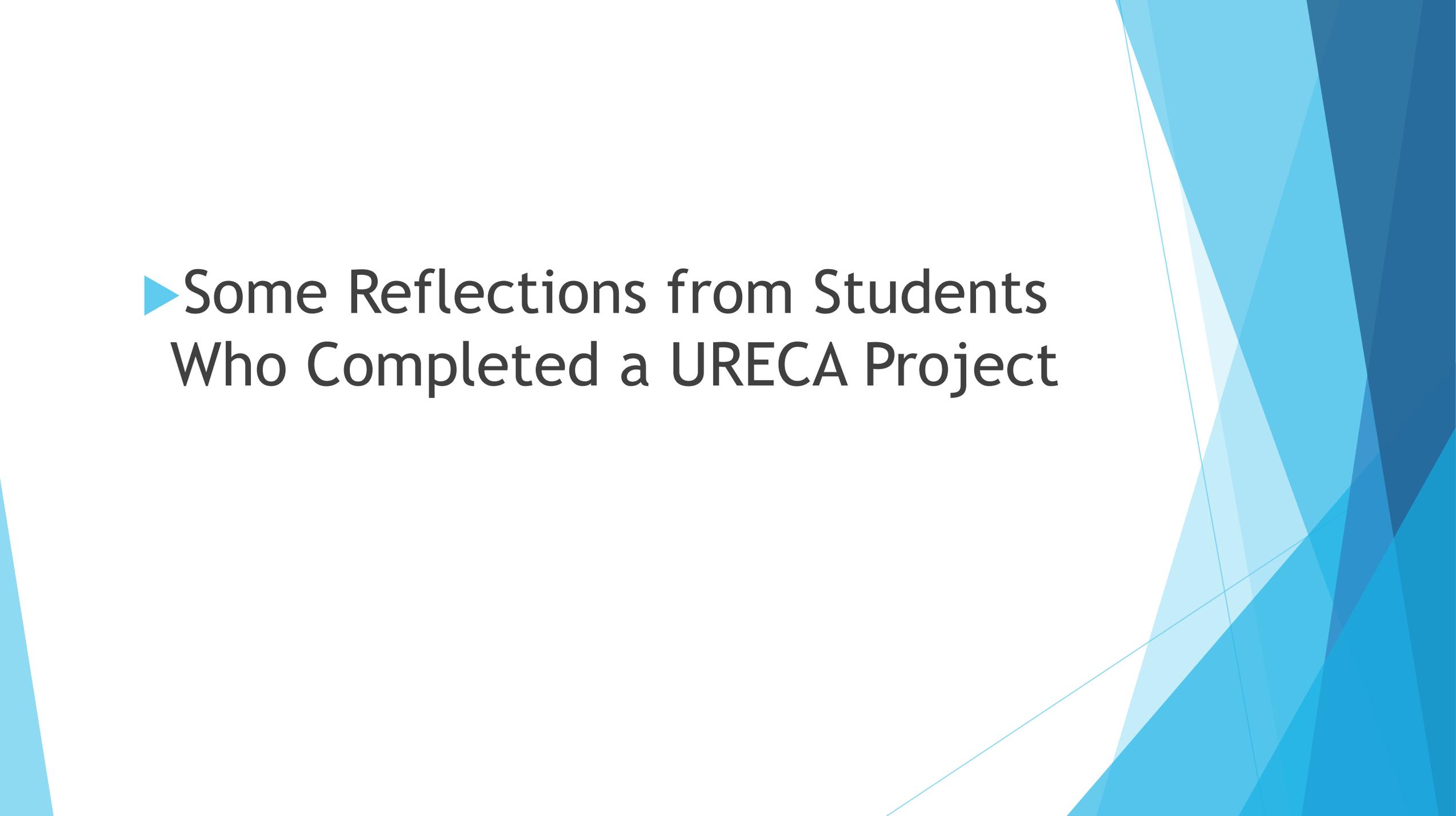
- ▶ Grants for research or creative activity awarded to undergraduate students based on merit
- ▶ Different levels of awards (depending on student experience):
 - Assistant
 - Scholar (Silver, Gold, Platinum)
 - Team (only available during the summer)
- ▶ Every level of award requires the following:
 - ✓ Application
 - ✓ Proposal
 - ✓ Letter of Support from Mentor
 - ✓ Detailed Project Timeline
 - ✓ Transcript
 - ✓ Budget (if applicable)

How Does URECA Work with MT Engage?

- Presently, there is no formal arrangement; however, URECA research must be over and above what students would do for any class they are in (thus, they should not be enrolled in more than 1-2 hours of research for course credit at the time they have the URECA grant); students cannot get paid for doing course research
- One possibility would be to develop one or more 1-hour MT Engage research classes for students who have a URECA grant (in psychology, we have PSY3990: Independent Research in Psychology); in that class, students would address the designated SLOs for MT Engage (https://mtsu.edu/mtengage/docs/F18_CourseCertification.pdf)
 - A research presentation makes a great contribution to the ePortfolio (whether or not it is for MT Engage credit)
 - Reflecting on the research process provides a valuable learning opportunity.

MT Engage SLOs and Research

- ▶ The ability to connect relevant experiences and academic knowledge (connections to experience)
- ▶ The ability to make connections across disciplines and perspectives (connections to discipline)
- ▶ The ability to adapt and apply information to new situations (transfer)
- ▶ The ability to use effective, appropriate, and various forms of communication to enhance the quality of their assignments (effective and integrated communication)
- ▶ The ability to demonstrate a developing sense of self as a learner, building on prior experiences to respond to new and challenging contexts, especially as it relates to their personal and professional development (self-assessment and reflection)

The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the right side of the slide, creating a modern, dynamic feel.

▶ Some Reflections from Students
Who Completed a URECA Project

How did the experience confirm or change your expectations about research in your field?

- “My experience really helped me to realize how demanding and fulfilling lab work is. I was in the lab almost everyday, even for a short period of time. I also had to quickly problem solve to avoid throwing out a weeks worth of work over making a minor error. It also confirmed that working in a scientific research lab requires a lot of persistence and consistency, as well as a steady hand and a good ability to follow directions.”

- ▶ “I feel that my experience with this project has change my expectations about how machine learning research is done. To find novelty in research, its important to make sure you completely understand the problem you are trying to solve. It is hard to implement a solution without understanding a problem. If you fully understand a problem, then you may find its limitations and shortcomings.”
- ▶ “This experience has given me more confidence as a filmmaker and interviewer. There were so many elements to this that I was not sure I could do, but I did it all. It was trial by fire, as they say, but I am so thankful that all of it happened. One vital component to all of this was the fact that there was no one telling me what to say or do. This was not an assignment whose goals and ideas were dictated by someone else. I did this on my own terms. This was a genuine opportunity to express ideas that have been percolating in my heart and mind for a long time.”

How did the experience benefit your education?

- “My research experience has been the cornerstone of my success at MTSU. I have gained a tremendous amount of knowledge from working in the lab, including two publications, multiple scholarships, and most recently, admission to one of the most prestigious graduate schools in the world. This would not have been the case without research, and URECA funding to enable me to spend less time off campus at work.”
- “Every phase of this project was a learning experience. Mistakes were made and learned from. Plans had to change, and I had to be more adaptable. Certain elements were non-negotiable, and I stood my ground on those. I ran the camera. I conducted the interviews. I did all of the editing. I recorded and performed all of the music. This was a labor of love that every fiber of my being wanted to bring to life. Pursuing this opportunity has been the best part of my college education.”

Would you recommend a high school student or college freshman to seek out opportunities for mentored research during their college career? If yes, why?

- “Research gives you an intrinsic desire to explore a topic you find fascinating rather than taking whatever shortcuts necessary to get a specific letter grade in a standardized class. I cannot stress this enough. Education needs a paradigm shift, and this is where it needs to go. Curiosity and wonder need to be the drivers.”

“I would strongly recommend mentored research for students while they are in college. The student-to-mentor dynamic is a one-on-one approach that has many advantages over the traditional classroom/group setting that dominates the college experience. First, there are no other voices clamoring to be heard. There is just the student within a forum to singularly pursue specific goals and a project tailored to her/his sensibilities and interests. Second, this dynamic is a chance for the student to be guided by someone who has had experience in the type of research being pursued. The kind of insight that the student can gain from this is incredibly valuable since it can help their work not only be stronger but also start from a place that is mindful of potential pitfalls and previous advancements in the field. Last of all, in the most ideal circumstances, the student is not alone when taking on a large-scale project because the mentor will be there to offer encouragement, support, and a listening ear when plans go awry. Having someone to turn to who deeply understands the work at hand can be instrumental in successfully completing the project. The mentor is the student's guiding and supportive hand all along the way.”

Any other comments or feedback about your URECA experience that you would like to share?

- “URECA is a wonderful program that teaches students to write proposals, think critically about science, engage with faculty members, and grants a massive competitive edge for the future. I am graduating in May, and would like to thank URECA for being a formative part of my MTSU experience.”
- “Receiving the URECA grant was further impetus and encouragement for me to make this film. I had my reservations as to whether or not I had the skills and personal fortitude to make it happen. Being approved honestly felt like someone was cheering me on to go ahead and do it all. People were willing to invest in me and in my creative vision. There are few things in the world that feel better than when people believe in you and find value in what you do. I am so deeply thankful for the unintended validation this gave me. It helped me have the confidence I needed to move forward.”
- “It was a great experience and I do want to do another URECA grant. I enjoyed my freedom to go off and learn things that wasn't confined to a classroom. It made me put into perspective that learning doesn't end when you get out of college. This whole experience will benefit me greatly no matter what career I go into.”

More Student Reflections

- ▶ <https://mtsu.edu/urc/ureca/reflections.php>