

Leveraging Embedded Undergraduate Research to Bolster Research Culture: A Multi-Pronged Approach Case Study

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About Me

The collage features several logos and images: a pair of glasses at the top center; a yellow map of West Virginia on the left; a Marine Corps emblem and a rolled diploma below it; a Florida Police Chiefs Association logo and a PAF (Police Chiefs Association of Florida) logo to the right; a Florida Institute of Technology logo (1958) in the center; a Futures Working Group logo (PFI / FBI) and a Behavioral Science Unit logo (FBI ACADEMY) at the bottom left; a map of the United States titled 'INDIAN COUNTRY FBI Violent Crime - Pending Cases' in the center-right; and two portrait photos of men, one in a police uniform and one in a suit, on the right side.

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About Me



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Case Study Overview

- Embedded Course Research
- Virtual Poster Competition
- Faculty Research Teams
 - Marshall – Center for Applied Criminal Case Analysis
 - Applied Partnerships
 - Darby – Brevard Zoo
- Roach Lab



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Embedded Course Research

- Research Methods II
- Animal Learning and Behavior
- Comparative Animal Cognition
- Research Experience Class (1 and 3 credit)

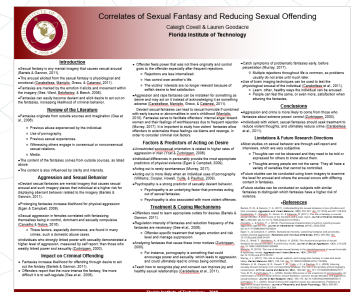


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Virtual Poster Competition

Middle Tennessee Invitational Virtual Poster Competition (MTIVPC)

- Hosted by Dr. Carter Smith at MTSU
 - Criminal Justice and Forensic Psychology undergraduate and graduate students.
 - 2018 was MTSU, University of Central Missouri, and Florida Tech.
- Meets APA quest for disseminating research.
 - GREAT for student to have opportunity to present a poster.



Easy to Replicate

- A few partner schools
- Grading criteria and rubric
- Faculty to Rate
- Use university templates
- Embed in class (option to paper)
- "Quick" initiative



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Faculty Research Teams

- All our faculty (undergraduate and graduate) have research teams.
 - May have GSAs
 - Rely on Undergraduate Student Support
- Forensic Psychology Example
 - Vanessa Edkins – Jury Decision Making
 - Julie Costopoulos – Clinical Assessment and Risk
 - Travis Conradt – Child Protection Teams and Interviewing
 - Marshall Jones – Offender Motivation and Organizational Behaviors
- Research or Service Centers
 - Center for Applied Criminal Case Analysis
 - Leverage student interest and skills to explore applied research in criminal justice.
 - Academic – Practitioner Partnership



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Academic – Practitioner Partnership Goals

- Provide applied research support to practitioner agencies.
- Provide opportunities for undergrads for real-world problem assessment, research, professional interactions with professionals, and application of academic research skills and concepts to real-world application.
- Provide community outreach and support for your university an department.
- Offer potential opportunities for profession and academic presentations and publication for all parties involved.
- Provide growth and development opportunity for students.
- Expanded network for academics and practitioners.



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Critical Steps

- Create a Research Team
- Locate and Create Partnerships
- Set Realistic Expectations
- Conduct Research, Analyze, and Report
- Dissemination and Acknowledgement



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Create a Research Team

- Create a team prior to soliciting applied projects.
 - Novel problems and/or new methods are challenging.
 - Existing team dynamic critical to success.
- Recruit and select students.
 - Suggest minimum GPA and coursework.
 - Have existing members help with recruiting and mentoring.
- Train
 - Involve the partnering agency in identifying needs and developing training
 - Scenario-based training may be best, especially for novel situations.
- Develop
 - Explore type of leadership style for the project. All students to take leadership roles and encourage leaderless workgroups where applicable.



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Locating & Creating Partnerships

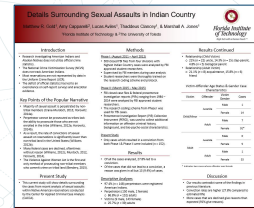
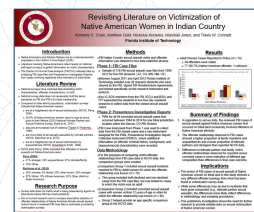
- Academics with prior practitioner experience often find this project easier as they have existing networks.
- These can be developed for those without the local or practitioner networks.
 - Market & Network yourself and your university
 - Local groups and associations
 - Local newspapers
 - Alumni
 - Become a resource to practitioners personally
 - Network, network, network. Offer assistance.
 - Literature reviews
 - Problem assessment
 - Professional services (focus group facilitation, consultation, or host events)
 - Activity look for and/or solicit projects
 - Look for opportunities not previously explored.
 - Don't be afraid to offer your research team's support
 - Even starting small builds momentum.
 - Be aware that practitioners may be reluctant to ask for help.



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Dissemination and Acknowledgement

- Publication
 - Even if the publication is limited to the partner agency, often in a white paper, it can still be a great experience for students and count as a publication.
 - Opportunities can present themselves for publication on methodologies even if findings cannot be published.
- Presentation and/or Training
 - Students gain incredible experience and insight by helping create and deliver presentations and training, either for practitioner audiences or academic settings.
- VITA
 - These opportunities can be very valuable to students for graduate school or career entry.
- Community Outreach/Service
 - Two birds with one stone. Research opportunities for faculty and students as well as community service for the university.



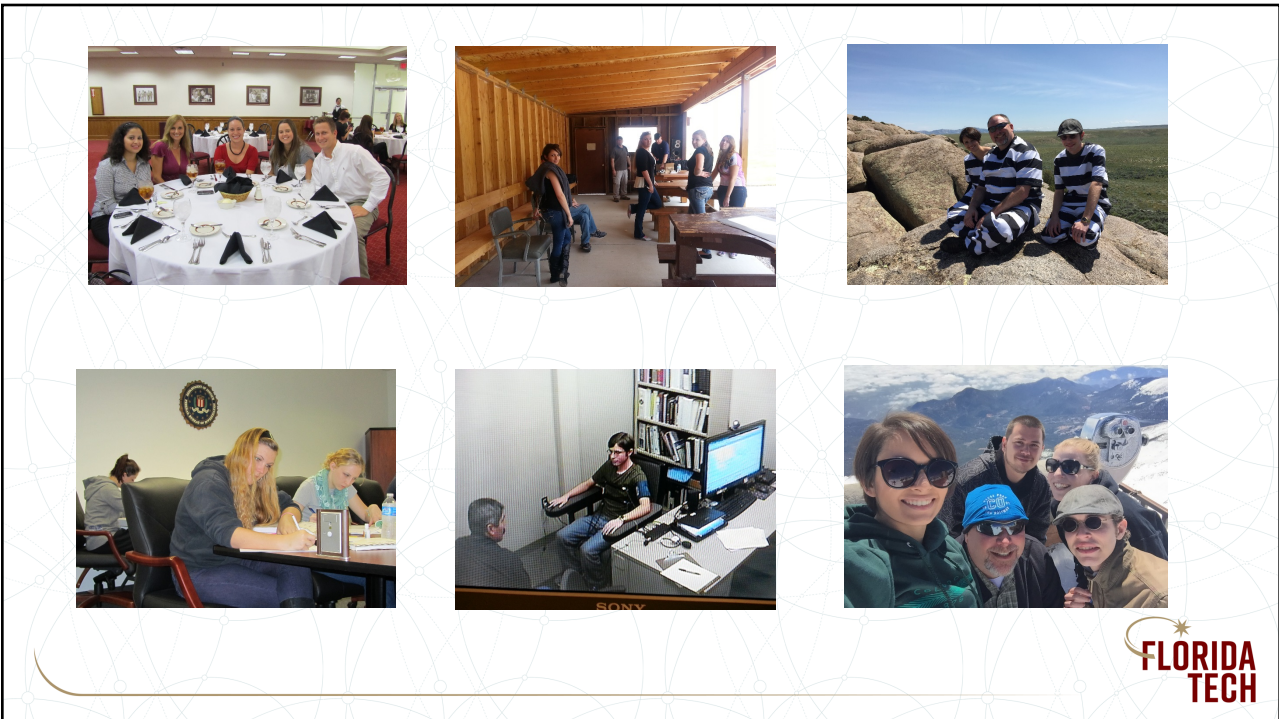
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Outcomes – What UG Students Say...


- Lucas - "This experience has helped to confirm what I want to do in the future."
- Matthew - "It's experience that you can't get anywhere else. You can't get this experience elsewhere and it helps prepare you for the future while helping you mature as a student."
- Nicole - "I think that getting the chance to network and develop connections in your field is great," The experience also helps to prepare you for graduate school."
- Jenna - "Being able to say that you were a part of a team that developed a new instrument, and is doing research in an unexplored area, is something that not everyone gets to do and is an invaluable experience."



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Cockroaches in the Classroom
Darby Proctor, Ph.D.

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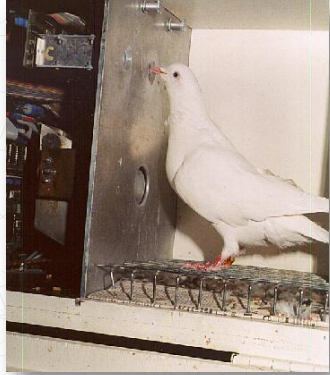


The Descent of Career

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Psychology Undergraduate Education



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Only 14-20% of psychology undergraduates have exposure to working with live animals.

—Perlman & McCann, 2005




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Active Learning

A

Percent Change in Failure Rate	Number of Studies
-15 to -10	1
-10 to -5	2
-5 to 0	3
0 to 5	13
5 to 10	13
10 to 15	10
15 to 20	13
20 to 25	8
25 to 30	2
30 to 35	1
35 to 40	1
40 to 45	1
45 to 50	1

Freeman et al., 2014

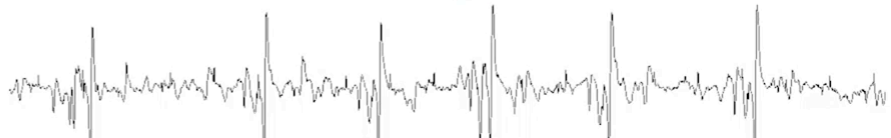


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Backyard Brains

Neuroscience for Everyone!
www.backyardbrains.com





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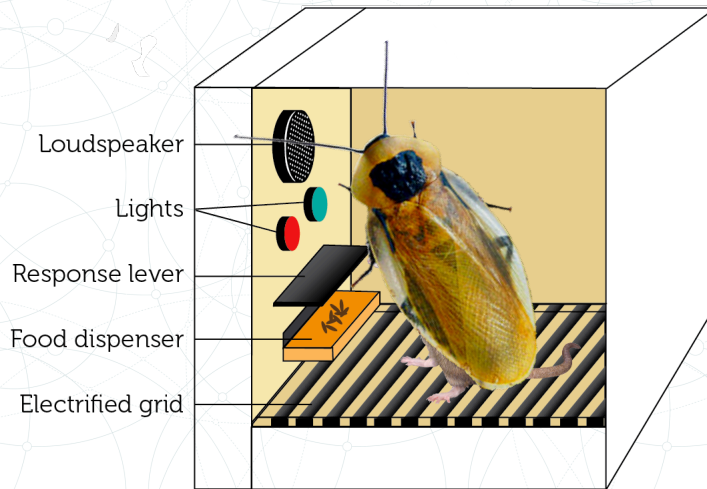
The study of roaches may lack the aesthetic values of bird-watching and the glamour of space flight, but nonetheless it would seem to be one of the more worthwhile of human activities.

—H.E. Evans, *Life on a Little Known Planet*



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Psychology Undergraduate Education



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Blaberus discoidialis

The Classroom Cockroach

many a cockroach
believes himself as
beautiful as a butterfly
have a heart, o have
a heart and
let them dream on
—archy, “archygrams”



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Timid roach, why be so shy? We are brothers, thou and I. In the midnight, like yourself, I explore the pantry shelf!
— C. Morley, "Nursery Rhymes for the Tender-Hearted"

A close-up photograph of a brown roach inside a blue LEGO Technic structure. The structure is a rectangular frame with a central opening. The word "Start" is written in white on the bottom-left corner of the structure. A pink LEGO piece is visible on the top-right edge. The background is dark.

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Motivating a Roach

Removable Divider

Threshold

Choice Chamber

Food Bowl

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Motivating a Roach

Mean Preference Scores

Preference	Mean Preference Score (approx.)
Froot Loop	0.55
Shelter	0.30
Sugar Water	0.25
Treat	0.25

Error Bars: +/- 1 SE

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Roach Behavior

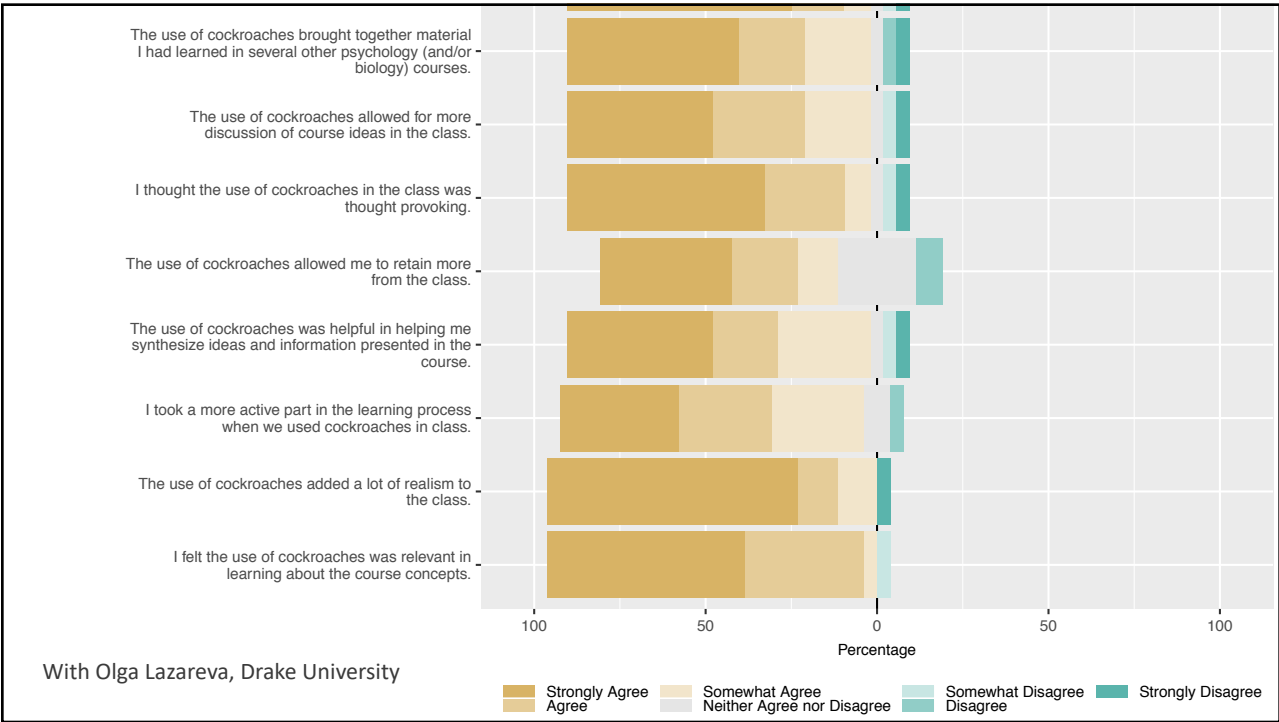


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Designing Projects



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Roachlab.org

Animal experiences in undergraduate classes

OUR MISSION:
Using cockroaches as animal models in undergraduate psychology classes to help students learn about behavior and cognition

Funded by 2017 Association for Psychological Science Small-Scale Teaching Grant

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Cockroach Experiments



COCKROACH PREFERENCE TEST

This experiment can be used to determine whether or not a cockroach has a preference when given two options. It is currently designed to test between Frootloops and cricket diet. However, this experiment can be adjusted to test any two items, including various edible items, colors, smells, shelters, etc. This experiment can be used to test the preference of a single cockroach or test whether species-wide preferences exist using several cockroaches.

[Cockroach Preference Testing Protocol \(DOC\)](#) →

Materials to 3D Print:

[Feeding Drawers](#) →

[Shelter](#) →

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Is there nothing to be said about a cockroach which is nice?
 It must have done a favor for somebody once or twice.
 No one will speak up for it in friendly conversations.
 Everyone cold-shoulders it except for its relations.
 Whenever it is mentioned, people's faces turn to ice.
 Is there nothing to be said about the cockroach which is nice?
 — M.A. Hoberman, "Cockroach"



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Acknowledgements

- Florida Tech students



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