Transdisciplinary collaborative learning: Design, practices, and experience with Telepresence, robotics, and makerspaces

Nick Swayne
*James Madison University, swaynedd@jmu.edu*

Kevin Giovanetti Ph.D.
*James Madison University, giovankl@jmu.edu*

Fred Briggs
*Nova Labs, fred.briggs@vektortek.com*

Patrice Ludwig Ph.D.
*James Madison University, ludwigpm@jmu.edu*

Sean Ronan McCarthy Ph.D.
*James Madison University, mccartsr@jmu.edu*

*See next page for additional authors*

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Authors
Nick Swayne, Kevin Giovanetti Ph.D., Fred Briggs, Patrice Ludwig Ph.D., Sean Ronan McCarthy Ph.D., Michele Estes Ph.D., Audrey J. Burnett, and Juhong Christie Liu Ph.D.

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TRANSDISCIPLINARY COLLABORATIVE LEARNING:
Design, Practices & Experience with Telepresence, Robotics, & Makerspaces

Nick Swayne, Kevin Giovanetti, Fred Briggs, Patrice Ludwig, Audrey Barnes, Sean McCarthy, Michele Estes & Juhong Christie Liu
TRANSDISCIPLINARY COLLABORATIVE LEARNING:
Design, Practices & Experience with Telepresence, Robotics, & Makerspaces
Michele Estes, Sean McCarthy, Patrice Ludwig, Nick Swayne, Audrey Barnes, Kevin Giovanetti, Fred Briggs & Juhong Christie Liu (not pictured)
Nick Swayne

Executive Director, 4-Virginia
Founding Director, JMU STEMx-Labs

swaynedd@jmu.edu
Course Sharing
Course Redesign
Degree Completion
Collaborative Research
MISSION:

Promote inter-university collaborations that leverage the strengths of each partner university in order to accomplish much more than any individual university could achieve alone.
Sharing STEM Courses:

Presidential-looking conference rooms aren’t suited for sharing STEM classes

No institutional interest in sharing “normal” STEM classes

Sharing normal STEM courses doesn’t accomplish the mission
2 (+1) QUESTIONS:

1- What kind of STEM (STEAM) courses can we share that will accomplish the mission?
   • Create applied courses that add greater value and deeper learning.
   • Integrate students and faculty from other disciplines into the experience.

2- What space do we need to teach those courses?
   • Makerspace
   • Networked spaces

+1- How do you find faculty and students to take on a new kind of course, in a new space and make it “count”?
Michele Estes
Associate Professor
Director, Graduate Educational Technology Programs, JMU
estesmd@jmu.edu
Kevin Giovanetti
Professor of Physics
James Madison University

giovankl@jmu.edu
Expertise in Particle & Nuclear Physics

Developed an interest in robotics

Wanted to collaborate with experts in the field
ROBOTICS = Abundant possibilities to explore emerging technologies
The challenge is to explore the use of core robotics principles in focused, applied scenarios.

Some examples of robotics applications:

- Sensor Reading
- Actuator (Motor) Control
- Programming
- Flight Algorithms
- Pixhawk (Brains)
- Mission Planner
- PID (Algorithms That Optimize Goal Attainment)
Problems:
Need to get “under the hood”:

Explore the relationship between sophisticated interfaces and kit components.

Understand the solution AND the process.
Getting under the hood: PID exercise

Goal keep the ball in the center
Must coordinate servo to move trough
Audrey Barnes
Assistant Professor & Area Head of Industrial Design
James Madison University

barnesal@jmu.edu | @iamaudreybarnes
INDUSTRIAL DESIGN & DESIGN THINKING
HUMAN-CENTERED. COLLABORATIVE. EXPERIMENTAL. OPTIMISTIC.

REALLY CONNECT w/PEOPLE.

Observe in their PLACE.
MAKING
MAKING
A-TEAM with a C-Plan

C-TEAM with an A-Plan
Fred Briggs
NOVA Labs
Owner Vektortek LLC
fredmbriggs@gmail.com
OUTSIDE PERSPECTIVE:

External technical expert
“Science, freedom, beauty, adventure--aviation offers it all.”

--Charles A. Lindbergh
ENTREPRENEURSHIP

Applied projects
Real world challenges
Patrice Ludwig
Assistant Professor of Biology
Entrepreneurship Faculty Fellow
James Madison University

ludwigpm@jmu.edu
MENTORSHIP
SCHOLARSHIP OF TEACHING & LEARNING
Qualitative Content Analysis:

TEXT de-constructed into CHUNKS

allocated to categories

basis for THEMES

compromised of words
Seán McCarthy
Assistant Professor of Writing, Rhetoric & Technical Communication
Entrepreneurship Faculty Fellow
James Madison University

mccartsr@jmu.edu | @claremummer
WORDPRESS

Fall 2015
sites.jmu.edu/jmudroneschallenge

Fall 2016
sites.jmu.edu/vadrones

Coming soon!
Our Comms OS
FINAL THOUGHTS
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Hope Ucciardi
Writing, Rhetoric and Technical Communication Student