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

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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

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Founding Director, JMU STEMx-Labs

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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”? 
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Associate Professor
Director, Graduate Educational Technology Programs, JMU

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Kevin Giovanetti
Professor of Physics
James Madison University

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Expertise in Particle & Nuclear Physics

Developed an interest in robotics

Wanted to collaborate with experts in the field
Abundant possibilities to explore emerging technologies
Some examples of robotics applications:

- Sensor Reading
- Actuator (Motor) Control
- Programming
- Flight Algorithms
- Pixhawk (Brains)
- Mission Planner
- PID (Algorithms That Optimize Goal Attainment)

The challenge is to explore the use of core robotics principles in focused, applied scenarios.
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 through.
Audrey Barnes
Assistant Professor & Area Head of Industrial Design
James Madison University

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INDUSTRIAL DESIGN & DESIGN THINKING
HUMAN-CENTERED.
COLLABORATIVE.
EXPERIMENTAL.
OPTIMISTIC.

REALLY CONNECT w/PEOPLE.

Observe in their PLACE.
COLLABORATIVE SPACE DESIGN
MAKING
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
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Entrepreneurship Faculty Fellow
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SCHOLARSHIP OF TEACHING & LEARNING
Qualitative Content Analysis:

TEXT → de-constructed into CHUNKS → allocated to categories

basis for

compromised of words

THEMES
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Assistant Professor of Writing, Rhetoric & Technical Communication
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Our Comms OS
JMU/VA Drones Communications

{ REPORTING
PROMOTION
ADVOCACY }
FINAL THOUGHTS
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