Learnings from a Research-Practice Partnership on Math Motivation

AMATYC – SO63
Nov. 16, 2018
8:00-8:50
Maryke Lee, Valencia College (retired)
Deborah Howard, Valencia College
Chris S. Hulleman, University of Virginia
Reflection Activity
The Collaboration

• Initially sponsored by the Carnegie Foundation for the Advancement of Teaching (Stanford, CA) and UCLA
• Carnegie introduced Valencia College Math Faculty to University of Virginia researchers during the Summer of 2013
• Program designed to partner educators with researchers to solve real-world problems
• Partners
  – Valencia College East Campus Math Department
  – Motivate Lab at the University of Virginia
Learning Number 1

Co-defining the problem that partners want to solve generates the investment required for the work to be successful

• Valencia was interested in improving success rates for developmental students

• University of Virginia wanted to research Utility Value interventions on Community College Students
Funding/Resourcing the project

Spring and Summer 2014 - Initial Pilot
• Interested Faculty
• No funding
• Identified funding sources while we applied for grants

Fall 2014
• Researcher received funding from Carnegie
• Valencia Faculty received some funding from endowed chairs

Fall 2015 NSF Grant Received
• Able to ramp up data collection and staffing
Motivate Lab Team

Chris Hulleman
Yoi Tibbetts
David Silverman
Megan Moran
Michelle Francis
Hank Murrah
Maryke Lee
Auburn Univ.
Retired Dean & Motivate Lab
Valencia Team

Deb Howard
Keri Siler
Julie Phelps
Craig Simpson

And who helped start it….

Jeff Kosovich
Center for Creative Leadership
Project Research Design

• 2 Types of Interventions that Target Motivation
  – **Expectancy**: Growth Mindset
  – **Value**: Utility Value

• **Control** Condition
  – Summary Writing
Learnings 2 and 3

Be prepared for initial setbacks. But, these “bumps” allow partners to develop more efficient project processes.

Trust-building is important at all levels of the system (e.g., practitioners, administrators, researchers), especially at the project’s onset.
How many people are involved?

- **12,995** students
  - SP16: $n = 1038$
  - SU16: $n = 456$
  - FA16: $n = 2344$
  - SP17: $n = 1449$
  - SU17: $n = 603$
  - FA17: $n = 2348$
  - SP18: $n = 1949$
  - FA18: $n = 2858$

- **63** Instructors

- **547** CRNs
  - MAT1033C: Intermediate Algebra
  - MGF1106: College Mathematics
  - STA1001: Introduction to Statistical Reasoning
Data Sources

**Students**
- Student Activities 1-4
- Focus Groups

**Instructors**
- Instructor Activity 1 & 2
- Syllabi
- Gradebook
- Focus Groups

**Administrative**
- Roster/Course List
- Grades & Demographics

**Other**
- Randomization
- RateMyProfessor Ratings
- Qualitative Coding

Master Dataset
Learning 4

Structuring the work of the partnership based on members’ values, costs, and expertise levels allow for better streamlining of project decisions and processes.
Site-based Team Structure

biweekly meetings
Learnings 5 and 6

Find tools that facilitate the project’s success but also minimize costs to partners.

Effective partnerships facilitate deeper understanding of the problem, its causes, and its solutions.
Design Challenge

• Drought Prompt
• Quantitative and Qualitative data show that students have trouble finding relevance
• Over half of our sample couldn’t relate to this situation
Mixed-Methods Design Process

Quantitative  Qualitative

Activity truly customized to context
Mixed-Methods Design Process

- Geographically relevant
- Talk about money!
- Make the quotes realistic
- Feedback from Partners

= The Hurricane Prompt
The Hurricane Prompt

"Every year when we prepare for hurricane season, we could estimate how much water and food we will need for one day, one week, or longer... That way we’d know how much money to set aside to be ready in case something bad happens."

Danielle, 26, Psychology Major
Learning 7

Effective partnerships build members’ capacities to more effectively embark on future projects.
Future Plans

• Explore student’s longitudinal outcomes
  • Starting with Fall 2014 pilot students
  • Track students to other Florida institutions

• Take deep dive into all data that has been collected
  • Institutional data on students and faculty
  • Classroom grades and teacher gradebooks
  • Qualitative students essays from intervention prompts
  • Focus group responses from students and faculty
  • Control groups surveys regarding the instructional climate

• Develop Faculty Training for Utility Value and Growth Mindset Interventions
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Presenters

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Research Questions

• #1: Does the expectancy-value intervention positively impact developmental math students’ math performance (course pass-rates) and persistence (course drop-out rates)?

• How does this differ from our pilot work?
  • Optimize the intervention to help all students
  • Include more types of courses
  • Include more faculty
#2: What student and contextual factors moderate and mediate the effects of the expectancy-value intervention on student learning outcomes?

Does it work better…
- For some teachers?
- In some classrooms?
- For some students?

Does it change…
- Students’ perceptions?
- Behaviors?
Research Questions

• #3: Does the expectancy-value intervention boost developmental math students’ college-level persistence as measured by subsequent enrollment in a four-year program upon degree completion?

• What happens when students leave your classroom?
  – More math?
  – Math-related Major?
  – Graduation?
  – Jobs?