**Florida-Caribbean Louis Stokes Regional Center of Excellence
Mindsets for STEM Summer 2020 Virtual Convening**

**Adaptive Mindsets and Resilience:
Broadening Participation in STEM at Community Colleges and HBCUs**

**June 15, 2020
10:00 a.m. - 12:00 p.m.**

MindsetsForSTEM.org
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Mission

The mission Florida-Caribbean Louis Stokes Regional Center of Excellence (FL-C LSRCE) is to **become a transformative research and training center** that **promotes student success** by developing, testing and disseminating interventions that **reduce the impact of social psychological barriers** and **enhance student and faculty mindsets** in the face of academic challenges.

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Welcome Back

Dr. Lawanda Cummings
University of the Virgin Islands

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Agenda

10:00 a.m.
Welcome ——————————————— Dr. Lawanda Cummings
Year One Findings ————————— Drs. Cummings and Fotuhi
Preview of Year Two ————————— Jhenai W. Chandler
and Dr. Diana Bowen

Presentation and Publication Opportunities —— Dr. Lawanda Cummings
Psychology of Self-Administered Interventions — Dr. Omid Fotuhi
    Intrinsic Factors: Academic Resilience
    Implementation: Plan/design
- Target Audience
- Distribution to participants
- Consent
- Timeline
- Grades

11:30 a.m. - 12 p.m.   Q & A

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Year One Review:
Student Intervention Design

- Students completed an **online intervention** targeting **intrinsic factors** with **4 randomly assigned conditions.**

- The **activation of students' intentions and/or goals** was **hypothesized to positively impact their sense of belonging, goal setting, mindset, and perceived capacity**.

Deployed at 4 Institutions:
- Santa Fe College (SF)
- Bethune-Cookman University (BCU)
- Tallahassee Community College (TCC)
- Valencia College (VC)

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Year One Review:
Student Intervention Data

1. The were no significant associations found for Sense of Belonging, Self-efficacy, or Mindset found.

2. There were differences found in goal setting variables at TCC, VC, and SF:
   - It is important for goals to be specific (VC and SF*)
   - Belief that it is possible to improve your effectiveness by setting goals (TCC*)
   - It is important that you have a clear plan of action to attain your goals (SF)

   Note. * $p < .05$

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Year One Review:
Lessons Learned

Quantitative Data:
Student intervention data revealed differences in goal-setting patterns among student populations with a higher concentration of non-traditional students (i.e., older, part-time)

Qualitative Data:
Student focus group data revealed patterns in how students navigated towards academic success.
- Hard work in isolation
- Limited strategies for acquiring help from school-level resources (i.e., office hours, tutoring)

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Year Two Preview:

1. **Game Plan for the Customized Intervention Implementation**

2. **More Faculty Development Opportunities**
   a. Mindset Series (July –August)* Registration is Open Now! Mindsetsforstem.org/events
   b. Diversity and Social Justice in STEM and Higher Education (August-October)

3. **Collaborative Partnerships in Publications and Presentations**

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Florida-Caribbean Louis Stokes Regional Center of Excellence
Presents a Professional Development Virtual Series :

"Modeling and Developing Growth Mindsets in STEM and Beyond"

Facilitated by Dr. Diana Bowen
Assistant Professor of Mathematics
University of the Virgin Islands

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The Research Paradox for HBCUs and CCs

Teaching Institutions are leaning towards greater focus of research:
- New grant demands for knowledge generation
- Shift to data-driven definitions of institutional success
- Shift in funding structures in many states

Many times less infrastructure to support basic research:
- Lab space
- Graduate students

Most faculty retain heavy teaching loads while doing research.

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The Research Paradox for HBCUs and CCs

- Critical role in the development of URMs for STEM inclusion

- Critical space for training students for industry

- Faculty innovate to meet student learning objectives, but these techniques rarely show up in the literature

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FL-C LSRCE as a Research Hub

Mindsets for STEM Conference
- Present in-course findings
- Space for sharing techniques and intervention implementation

STEM Central
- Platform for sharing information with the field
- OP-Eds, Blogs, Discussion groups

Support for Publication/ Proposal Development

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Faculty Research Opportunities
(more loading…)

1. Mindsets for STEM Conference 2021 proposal expansion

2. Proposal Submission for SACNAS that includes 2 faculty partners

3. OP-ED Opportunities on STEM Central

4. Support for participating faculty to use current in-class intervention strategies for educational research

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Intervention Implementation Plan

Dr. Omid Fotuhi

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Overview

1. Discussion about pilot findings and process of continuous improvement
2. Group discussion: takeaways and questions (10 min.)
3. Connecting to Theory and Strategies (25 min.)
4. Reflection and Next steps (10 min.)

Objectives

1. How to make data-driven decisions
2. Understanding student needs, especially during times of disruption
3. Providing autonomy support: available, responsive and respectful
4. Preparing for Intervention Implementation
5. Open discussion about current issues

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Start, and End, with ?

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Discussion: What would you do?

Student, who is struggling academically, enters advising and says:

"I know I'm not doing well, but I can do better. I know that I have forces acting against me, but as the first person in my family to come to college, I know that I have to find a way to do better. There's too much riding on me. So, don't worry. I'll turn things around… I'll find a way, I'll work harder."

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Cultural Cues

- Guiding Questions in Ambiguity -

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Grit Mania

Grit (Duckworth): Perseverance and passion for long-term goals

>19,500,100 views!

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Grit Mania

- Talent x **effort** = skill.

- Skill x **effort** = achievement.

- Effort is exponentially related to achievement
  - Duckworth

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Costs of Grit

- Grittier participants more willing to risk failing to complete a task by persisting on individual items.

- When they are losing, less likely to quit.

(Lucas et al. 2015)

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COVID Related Isolation

"We're all alone" vs. "We're all alone together"

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The Stanford Duck Syndrome

- **Other Ducks**
  - Gliding effortlessly

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The Stanford Duck Syndrome

- **Below the surface**
  - Paddling furiously

- **Subversion of effort: Core of Duck Syndrome**
  - Feeling that you're alone, making so much effort

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Autonomy support

Psychological Development of the Self-Concept

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Learning Across Lifetime

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Shifting the Questions

1 *How Can I?*

How can I do it?
How can I find ways to connect?
How can I find ways to get support?

Can I? *2*

Can I do it?
Can I come to belong here?
Can I trust that I'll be supported?

3 *Why?*

Am I doing this because I want to
or because I have to?

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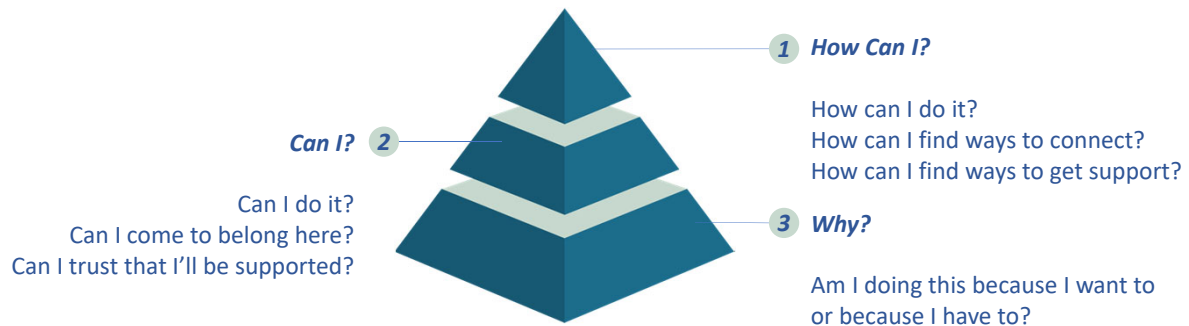
Self-Determination Theory
Theory of Motivation
- Extrinsic
- Intrinsic
  - It is concerned with the motivation behind choices people make freely

Conditions that foster intrinsic motivation (well-being)
- When needs (not wants) are satisfied
- Frustration of needs leads to disruption of functioning

(Ryan & Deci, 2000, 2017)

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Self-Determination Theory

Competence
The experience of mastery and being effective in one's activity.

Autonomy
The feeling one has choice and willingly endorsing one's behavior.

Relatedness
The need to feel connected and belongingness with others.

Motivation

(Ryan & Deci, 2000, 2017)

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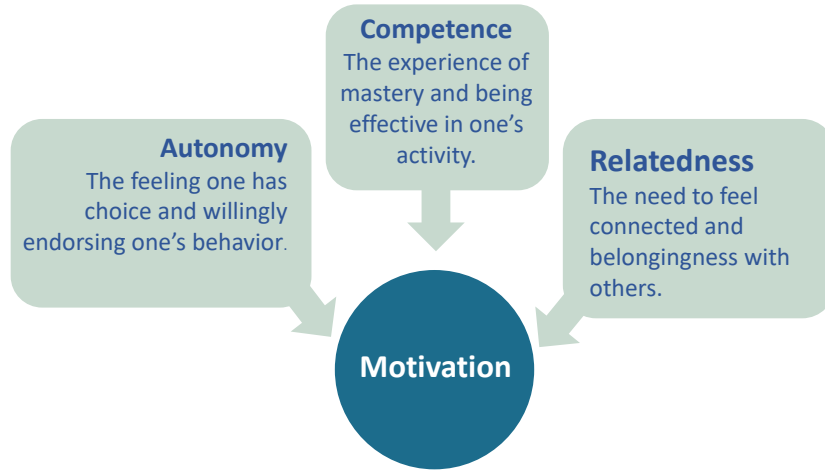
Conditions of Learning:
Teachers vs. Learners

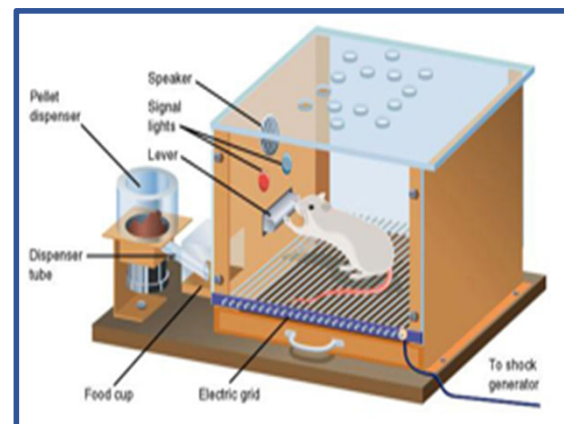|	Controlling	→	Autonomy
• **Goals**	Teachers		Learners
• **Content**	Teachers		Learners
• **Strategies for learning**	Teachers		Learners
• **Products (assignments)**	Teachers		Learners
• **Purpose (why you're learning)**	Teachers		Learners
• **Grading**	Teachers		Learners
• **Schedule**	Teachers		Learners
• **Interactions**	Teachers		Learners
• **Resources**	Teachers		Learners
• **Space**	Teachers		Learners

(Ryan & Deci, 2000, 2017)

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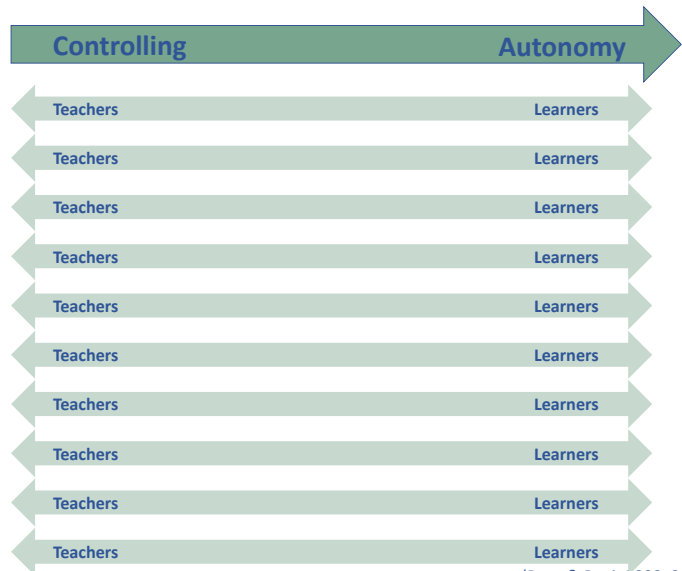
Autonomy-Supportive vs. Controlling Pedagogy

Autonomy-Supportive

- Adopt the students' perspective.
- Welcome students' thoughts, feelings and actions.
- Provide explanatory rationales.
- Nurture inner motivational resources

  (e.g. interest, purpose, values, giving back)
- Rely on non-controlling and informational language.
- Display patience to allow time for self-paced learning.
- Acknowledge and accept expressions of negative affect.

Controlling

- Adopt the teacher's perspective.
- Intrude into the students' thoughts, feelings, or actions.
- Neglect explanatory rationales.
- Rely on outer sources of motivation

  (*e.g. grades, threats, rewards*)
- Rely on pressure-inducing language.
- Display impatience for students to produce right answer.
- Assert power to overcome students' complaints

  and expressions of negative affect.

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Autonomy Supportive Teaching

Provides:

- **Clarity of rules, boundaries, consequences** -> competence
- **Listen** -> relatedness/respect
- **Provide Choice** -> autonomy

Conveys:

"**I am your ally**. I am here to support you and your goals"

vs.

"**I am your boss**. I am here to change you or make you 'better'."

Self-Determination Theory: Motivation & Education (Deci et al., 2011)

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Solutions

Clarifying Optimal Strategies

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Treisman Model: Collaborative Learning

- "… the key then was **to build a community** based in the study of mathematics, to **create a merging rather than a separation** of academic and social lives."

- Highly successful at improving student success

(Treisman, 1985, p. 16)

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Psychological Intervention to Facilitate Engagement

- Psychological intervention designed to normalize the concerns and anxieties that students might have about engaging.

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Wise Interventions

Insight Building Process: Informed by YOUR Students;
Designed for YOUR Students

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Focus Group and Survey

- To understand students' experiences and language that they use to convey those concerns and aspirations.

- To capture these experiences, we employ:
  - A pre-visit survey
  - Focus groups discussion

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Wise Elements

- Students treated as benefactors, not beneficiaries

- Message reinforced using "saying-is-believing" techniques

- Delivered early to interrupt maladaptive recursive cycles

(Aronson et al., 2002)

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Insights from Focus Group at other Campuses

Run by Jhenai at SFC campus on April 19, 2018

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Challenges Themes from Focus Group

Hidden Curriculum:

- Adulting
- Not knowing how college "works"
- Self motivation
- Time management
- Money management
- Ownership
- Focus
- Procrastination
- Passion
- Goal-setting

"Bootstrap" mindset

- "Nothing came easy, but my mom told me take initiative."
- "Emphasis of effort placed on students."
- "Good job picking yourself up when no one was there for you."
- "I had to stay strong because I refused to be another statistic."

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Proposed Intervention

Fall 2020

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Proposed intervention

- **Adaptive Resilience (de novo)**

  - Borne out of recognition that certain students respond to difficulty by trying to get through it on their own.

  - Research shows working with others (e.g., prof, peers) is more effective strategy for learning.

  - Reframes the meaning of resilience from a solitary journey to a collaborative experience.
    - Encourages help-seeking

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Methods

- Web-based (Qualtrics link will be shared)

- Design:
  - Students randomly assigned to one of 2 conditions.

- The activity is self-contained and self-paced taking about 30-45 minutes

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Implementation plan

Considerations

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Overview

- Target audience: STEM students

- Consent (built-in on the intervention)

- Distribution to participants
  - Standard script
  - Do not comment about theory

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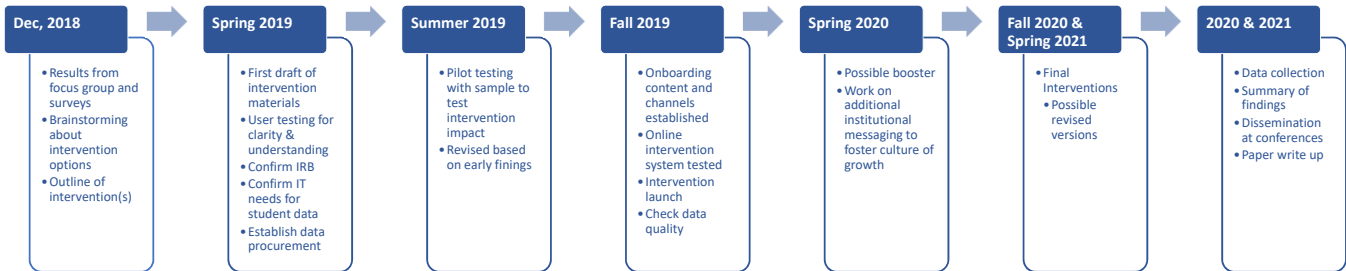**Regional** Center of Excellence

Overview

- **Timeline (pre-post tests)**
  - T1: early Fall
  - T2: near the end of the term (~Oct/Nov)
- **Replication in Spring**
  - T1: early Spring
  - T2: near the end of the term (~April/May)
- **Outcomes**
  - Grades
  - # of visits to office hours

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Project Timeline

Dec, 2018	Spring 2019	Summer 2019	Fall 2019	Spring 2020	Fall 2020 & Spring 2021	2020 & 2021
• Results from focus group and surveys • Brainstorming about intervention options • Outline of intervention(s)	• First draft of intervention materials • User testing for clarity & understanding • Confirm IRB • Confirm IT needs for student data • Establish data procurement	• Pilot testing with sample to test intervention impact • Revised based on early finings	• Onboarding content and channels established • Online intervention system tested • Intervention launch • Check data quality	• Possible booster • Work on additional institutional messaging to foster culture of growth	• Final Interventions • Possible revised versions	• Data collection • Summary of findings • Dissemination at conferences • Paper write up

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Implementation instructions

How to navigate expectations about activity

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How to introduce activity – Do's and Don'ts

- When talking with students, **DON'T emphasize that this intervention** is meant to help them.

- When talking with students, **DON'T make it seem like their grades will be determined by this exercise**, or that they will be receiving any other form of reward for their participation.

- If students ask why they should complete the intervention, **DO emphasize that they are being asked to complete it because your school wants to hear their feedback and know about them.**

- If specifically asked by a student whether there are different versions of the intervention survey, **DO say that there are, but DON'T say that some versions may be more beneficial than others.**

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Proposed wording when introducing activity

Suggested Language:

- *"We're going to ask you to complete a short reflection activity today. This is a project that we're collaborating with researchers on, and across a number of neighboring institutions."*

- *"The goal of this activity is to help us better understand your beliefs and attitudes related to your student experience here at XX school"*

- *"We hope to use your insights to better understand what future students, like you, might value and be thinking about during this important time."*

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