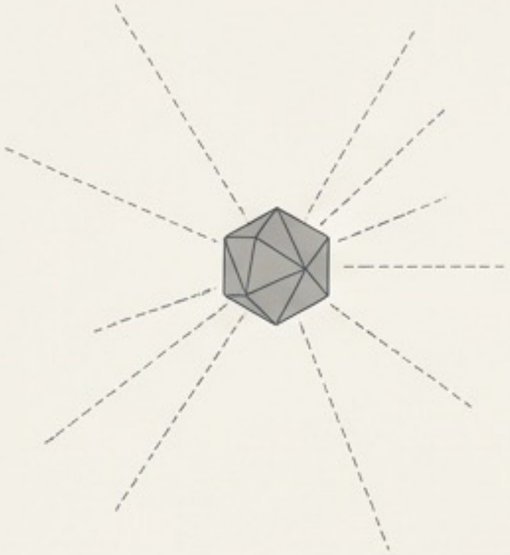
Embedding Intentional Mentoring for Community College STEM Students

Moving from transactional advising to identity-affirming ecosystems.

Dr. Maria Luz Espino

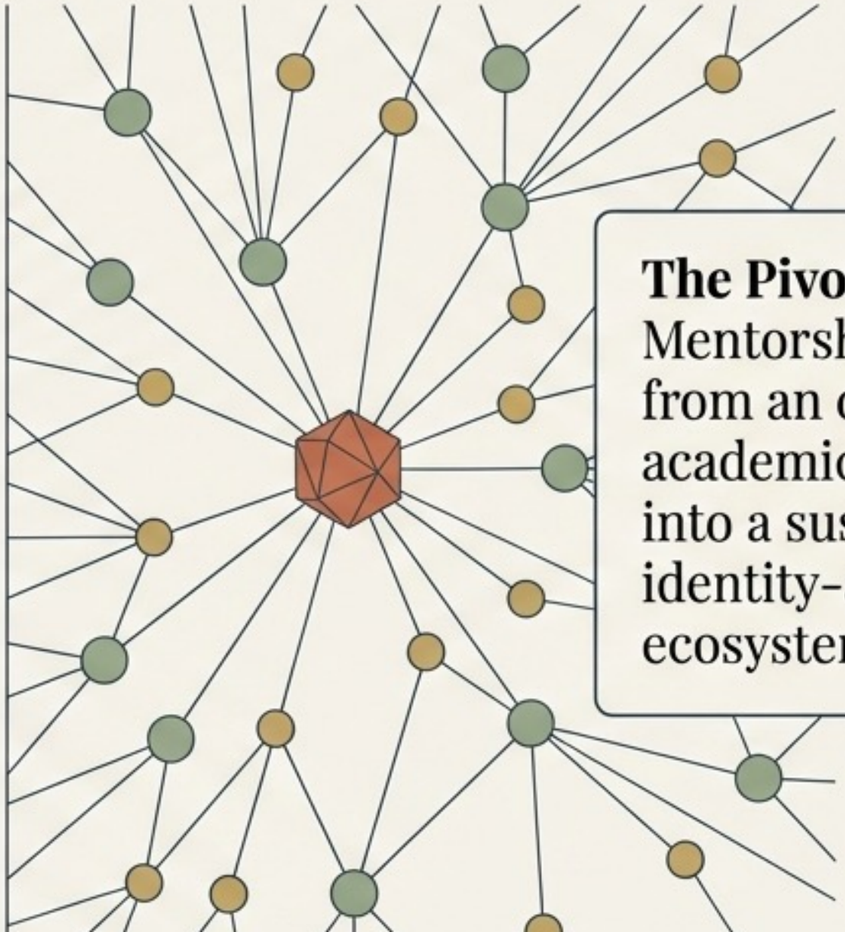
The Isolation Barrier in Community College STEM

Community colleges expand access to STEM for historically underserved students, but retention remains a persistent challenge. The primary barrier is rarely just academic capability; it is profound isolation.



The Isolated Student

- Carries complex external loads: financial constraints, family obligations, lack of generational institutional knowledge.
- Traditional interventions treat the symptom (academic tutoring) rather than the root cause (lack of belonging).



The Pivot:
Mentorship must evolve from an occasional academic transaction into a sustained, identity-affirming ecosystem.

Theory into Practice at Holyoke Community College

Academic Enrichment

Student-led syllabus input, technical workshops.

Culturally Responsive Spaces

Explicit integration of CRP & CCW frameworks not found in standard courses.

The HCC STEMinar

A 1-credit, semester-long seminar exclusively for NSF-funded S-STEM Scholars.

Mentorship & Leadership

Faculty, industry reps, and peer-to-peer mentoring.

"A dedicated space to engage with STEM through a lens that acknowledged their lived experiences."

Fueling the Engine: CRP and CCW

Culturally Relevant Pedagogy (CRP)

The Definition:

Teaching approaches that affirm students' cultural identities and promote critical social awareness alongside academic excellence (Gay, 2018).

The Application:

Moving away from historically proven, static facts to active dialogues about how STEM impacts students' actual lives, communities, and futures.

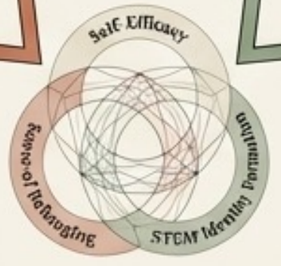
Community Cultural Wealth (CCW)

The Definition:

A framework shifting the narrative of valuable knowledge. Recognizing that historically marginalized students carry rich social, navigational, and familial capital into academic spaces (Yosso, 2005).

The Application:

Helping students realize they thrive academically because of, not in spite of, their lived experiences.



NotebookLM

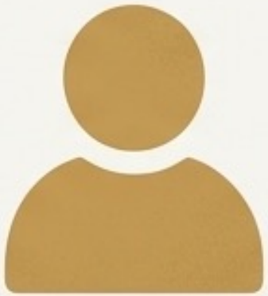
Anatomy of a Culturally Responsive Classroom

The CCW Wheel

Assignments connecting personal backgrounds to the Community Cultural Wealth framework.

Peer-Led Discussions

Shifting from static facts to philosophical, student-driven dialogues on current events.



Cultural Wealth STEM Narrative

A culminating presentation connecting intersecting personal identities with professional STEM pathways.

Diverse Guest Speakers

Exposure to varied STEM industries and academia to expand the definition of a STEM professional.

Reframing Identity Through Cultural Wealth

Recognizing Assets (Jim)

"The community cultural wealth was very expansive... It helped me put it in a structure. I do have a lot of navigational capital because I advocate for myself a lot."

→ **Theory becomes a tool for self-recognition.**

Contextualizing Science (Bobby)

"...we're talking about current events, how it affects our lives, how it affects the future... I really liked those discussions."

→ **Static facts become relevant, real-world agency.**

Dismantling Deficits (Dolores)

"...talking about how there's no such thing as being naturally good at anything... versus 'If you are interested enough, you can do anything.'"

→ **Challenging the natural talent myth builds STEM identity.**

Redefining Mentorship: From Transaction to Ecosystem

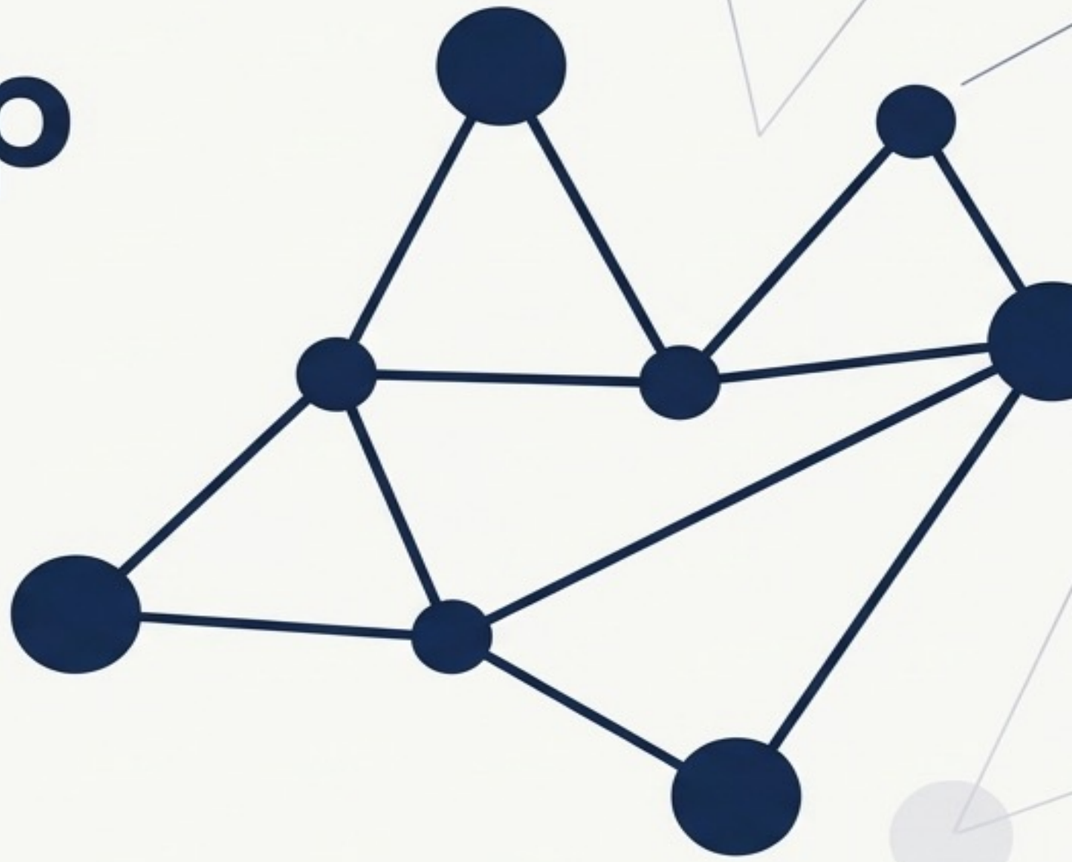
	Old Paradigm: Transactional	New Paradigm: Intentional Ecosystem
View of Student	Deficit Lens (Focus on what the student lacks: resources, preparation)	Asset Lens / Community Cultural Wealth (Focus on the inherent resilience and capital students bring)
Primary Goal	Memorization, immediate course survival, and compliance	Holistic STEM identity development and long-term professional self-efficacy
Pedagogical Approach	Hierarchical, directive, one-way knowledge transfer	Culturally Relevant Pedagogy (CRP), dialogue-based, co-constructed learning
Desired Outcome	Isolated academic success (passing the test)	Synergistic integration into the broader STEM community

The Mentorship Toolkit: Adaptable Models for Community Colleges

Mentorship Model	Primary Benefit	Ideal Student Population
STEM E-Mentoring	Overcomes geographic/physical barriers.	Students with disabilities; high-flexibility needs.
Research Mentoring	Hands-on hypothesis/data skills.	Academic/career pipeline alignment; transfer prep.
Economically Disadvantaged/Rural	Connects isolated students to industry networks/internships.	Under-resourced regional campuses.
Guided Mentorship	Ensures 100% baseline support.	Broad scale implementation; embedding directly into existing curriculum.
Social Community Mentoring	Peer/faculty networks that validate discipline purpose.	Racially minoritized students seeking belonging.

The Mentorship Model Match

Aligning STEM Student Success with Institutional Capacity



FACILITATION & BREAKOUT SESSION

Five Models of Mentorship

STEM E-Mentoring

Online & Flexible

Research Mentoring

Hands-on Projects

Guided Mentorship

Curriculum-Embedded

Economically Disadvantaged Communities

Rural & Under-resourced

Social Community Mentoring

Peer & Professional Networks

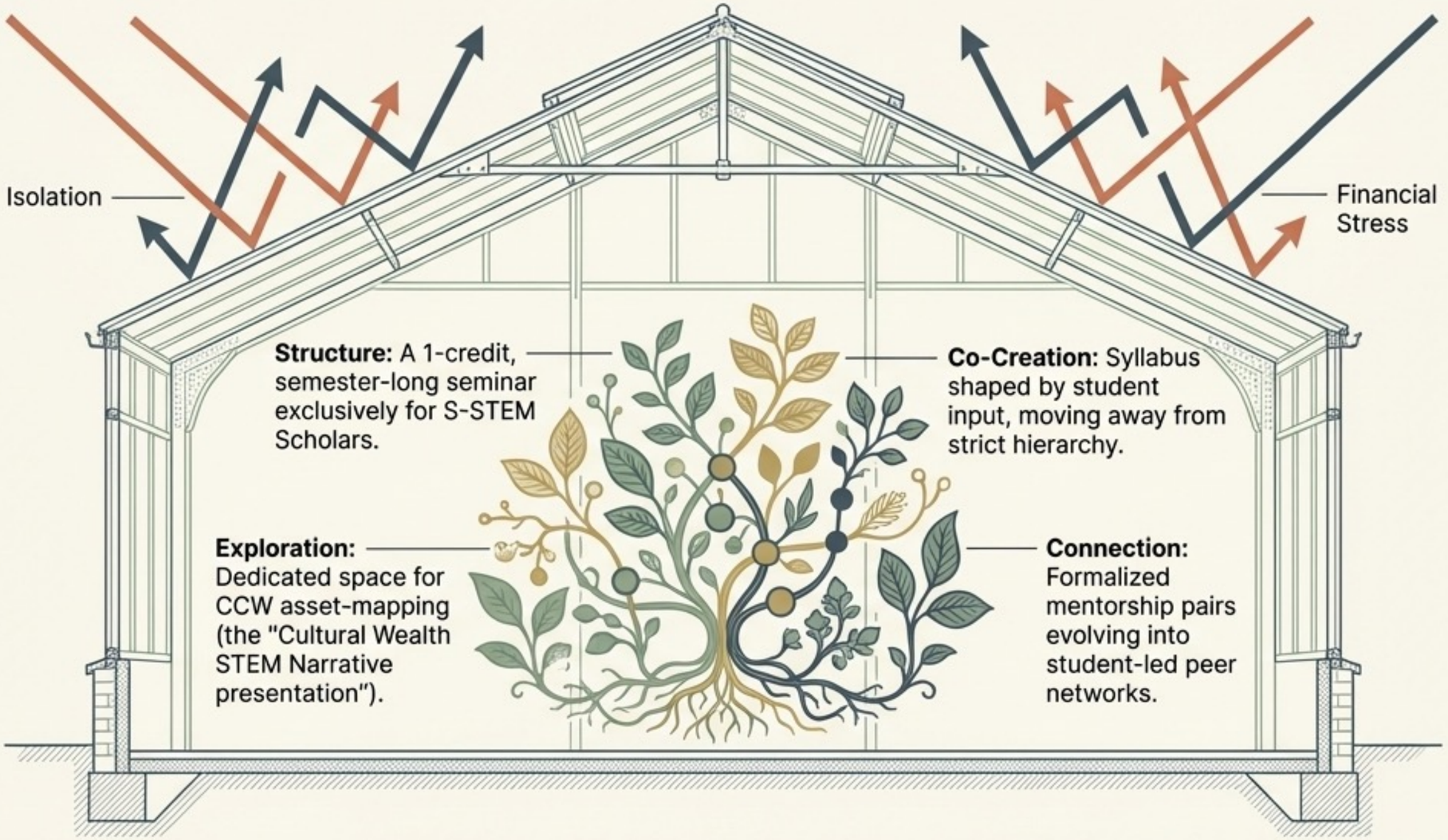
Breakout Session

Discuss with your group which of these models are currently implemented on your campus.

Based on the reading, which model is your campus currently missing, and what is the biggest barrier (e.g., faculty teaching loads or limited resources) to implementing it?

15 Minutes
Total: 2 min reading & review | 10 min discussion | 3 min share-out

Blueprint for an Ecosystem: The HCC S-STEM Seminar



The Result: A dedicated space where students engage with STEM through a lens that explicitly acknowledges their lived experiences.

COMMUNITY
COLLEGE
S-STEM
NETWORK

We want to hear from you!

Feedback: Please take the survey at the QR code or at this link, for our third-party evaluator. [CCSN Webinar Survey, 2025]

Research Partnerships: Become a research partner with us and together we can further explore important research topics. Message Elizabeth Meza emeza@uw.edu or Maria Luz Espino, me560@smlr.rutgers.edu