

Developing Evaluation Approaches for STEM Capacity Building at HSIs

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Risk and Choice

- The ONLY CHOICES for building the strongest U.S. workforce capacity in STEM reside in the pre K –12 and post-secondary arena from communities of color.

We really have no other choice but to dedicate ourselves to the CONTINUOUS transformation of our learning systems.

Knowledge, learning, information, skilled intelligence are the new raw materials of global and local living, global and local business, global and local culture.

What This Means

- Where should we turn for the science and engineering workforce of the future?
- What about our own talent supply?

Major Challenges

- **The “against all odds” mentality - Building and maintaining engagement with learning.**
- **Post-secondary attainment of Hispanics – is absolutely essential to ensure the emergence of Hispanic leadership in the scientific workforce – there is no other path.**
- **Developing the Hispanic STEM Workforce needs to look no further than to cut the attrition rate of Latinos in undergraduate STEM majors in half within 5 - 10 years.**

Why HSIs?

- HSIs.....
- One of the largest untapped resources for STEM
 - ◆ Human Capital
 - ◆ Intellectual/Knowledge Capital
 - ◆ Economic and Social Capital

Why Latinas y Latinos y Monorities?

- Is there any reason to believe that intelligence and talent are not normally distributed?
- So among our women, minorities and persons with disabilities should we not expect normal distributions of scientists, doctors, engineers?
- But we do not get them-
 - ◆ Why are not getting them at HSI's?

How to build capacity: Higher Education Design Principles

www.bestworkforce.org

- ✓ *Institutional leadership*
- ✓ *Targeted recruitment & Retention*
- ✓ *Engaged faculty*
- ✓ *Personal attention*
- ✓ *Peer support*
- ✓ *Enriched research opportunities*
- ✓ *Bridging to the next level*
- ✓ *Continuous evaluation*

How to build capacity:
Model Institutions for Excellence
http://www.air.org/publications/documents/MIE_Report_final.pdf

- Seven essential components:
 - ◆ Pre-college initiatives
 - ◆ Student support
 - ◆ Undergraduate research
 - ◆ Faculty development
 - ◆ Curriculum development
 - ◆ Physical infrastructure development
 - ◆ STEM transitions to graduate school & workforce

You will know you have built capacity when you have...

- ***Sustainability*** - long-term ownership & commitment.
- ***Institutionalization*** - a successful program becomes synonymous with the mission of the host institution.
- ***Scalability*** - additional stakeholders secure financial support and institutional buy-in. Whole communities invest in educational practices that endow the next generation of STEM degrees.

So What DO you Measure?

- Enrollment?
- Graduation?
- “Intervention” Impact?
- Faculty Engagement?
- Institutional Investments?
- Etc.....???????

What about Transformational Change? (ACE, *En Route to Transformation*, 1998)

Transformation...

- *alters the culture of the institution by changing select underlying assumptions and institutional behaviors, processes, and products;*
- *is deep and pervasive, affecting the whole institution;*
- *is intentional; and*
- *occurs over time.*

In other words....

- You want to wind up with sustainable change in the way you do your STEM education so that you are always maximizing student success.
- How will you know when you get there?

STEM Institutional Capacity

- What are you doing when your building this?
 - ◆ Just improving graduation rates?
 - ◆ Or changing values, practices, attitudes, practices & policies?
- You want to know the outcomes and how you achieved those outcomes.

How to know your outcomes

- Summative outcomes – assesses cumulative impact – the quality and impact of a fully developed project
- Formative – assess initial, intermediate and ongoing project activities and outcomes that inform program improvement

Formative Components

- **Implementation Evaluation** - Assess whether the project is being conducted as planned.
- **Progress Evaluation** - Assess progress in meeting the goals of the program and the project. It involves collecting information to learn whether or not the benchmarks of participant progress were met and to point out unexpected developments.

Achieving Impact

Achieving and sustaining HSI STEM success requires:

- ◆ Institutional and individual commitment
- ◆ Unified and financially supported effort
- ◆ Tenacity and Persistence - hard work over time transforming and building success

What This Means

- Do you know your own data?
- Do you know how many Latino and Latina students enter your classrooms, your department and come back the next year and finish?
- If you don't – why not?
- Do you know why the ones who don't – don't?
- Do you know why the ones who do –do?
- When you do, and stay true to this – you have built HSI capacity in STEM?

We Can Change the Course of this River!

Si se puede!