

# Fostering STEM Education in Institutes of Higher Learning

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3,289  
Undergraduate  
Engineering  
Colleges

1.5 M  
Engineering  
Graduates/year

31 NITs  
and  
23 IITs

Private  
Public  
Public/Private

85% of the  
students are  
educated by  
self financing  
colleges

# Challenges

- ✓ **Experiential Learning**
- ✓ **Globalization**
- ✓ **Flexibility in curriculum to adapt to changes**
- ✓ **Training of instructors and faculty**

A word cloud centered around the word "Pedagogy". The word "Pedagogy" is the largest and most prominent, written in a black serif font. Surrounding it are various related terms in different colors and sizes. The colors used are red, blue, green, and black. The words are arranged in a roughly circular pattern around the central word.

Assessment  
Partnerships  
Creativity  
Innovate  
Design  
Accreditation  
Scholarship  
Technology  
Inclusion  
Professional Development  
Leadership  
Teaching and Learning  
Experimentation  
Student Centric  
Experiential  
Best Practices

Provide contacts with funding agencies  
Facilitate networks  
Sustained and high impact research



**SOTL**



**Faculty  
Development**

Early career instructors and faculty  
Work-life balance  
Handling conflict  
Facilitation for current campus leaders  
Cultivation of future leaders



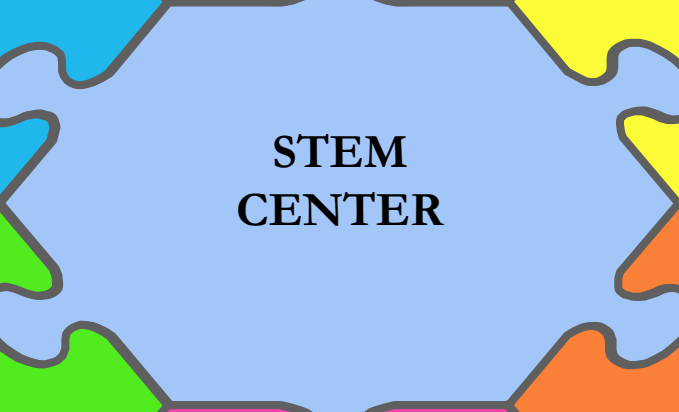
**Assessment**

Impact of interventions  
Accreditation  
Curriculum review  
Achievement of learning goals



**Workshops &  
Webinars**

Speaker series  
Sharing of best practices  
IUCEE webinars  
Regional conferences



**STEM  
CENTER**

Conference/Journal papers  
Information warehouse



**Resource  
Centre**

Online course development  
Software in support of course development



**Technology**

# Building Blocks of a Successful Center

## ✓ Developing and communicating the Vision and Mission

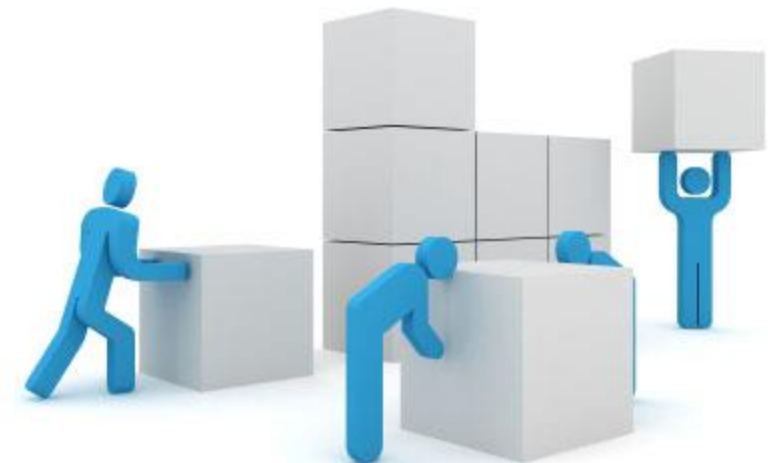
- Internal and external stakeholders
- Management buy in

## ✓ Organizational Structure

- Match structure to mission
- Dedicated center staff
- Split faculty appointments
- Center fellows

## ✓ Center Funding (\$)

- Institutional support (recurring funding)
- Industry partners
- In-kind



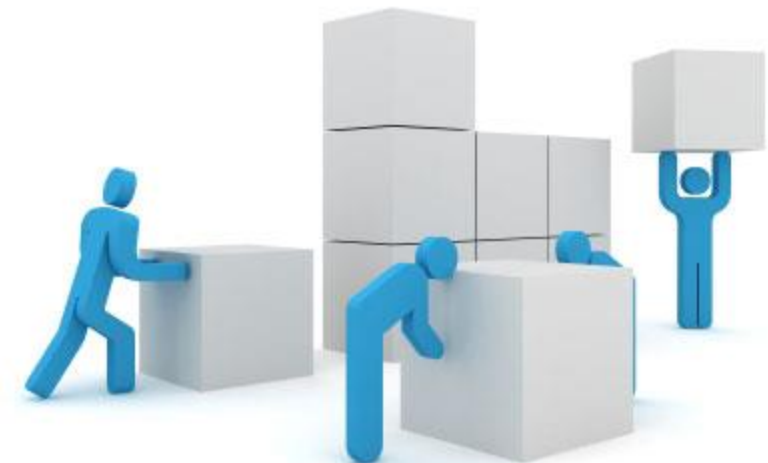
# Building Blocks of a Successful Center

## ✓ Evaluation and Assessment

- Short- and Long-term to assess effectiveness—possible mid course corrections
  - Measures of progress
- External advisory board

## ✓ Building/Maintaining Partnerships

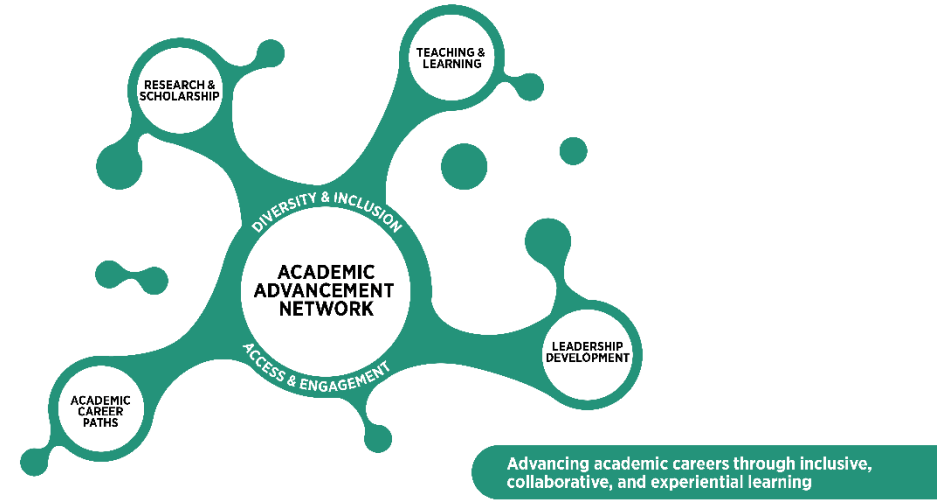
- Share yearly progress reports with partners
- Highlight successes and broader impacts





Center for Learning and Teaching,  
University of Washington

**Centre of Excellence for Teaching and Learning (CETL)**  
**ABES College of Engineering**  
**Ghaziabad, UP**  
<http://www.abes.ac.in/skill-building/cetl1>



**Michigan State University**

**Centre for Engineering Education Research (CEER)**  
**Bhoomaraddi College of Engineering and Technology**  
**Hubli, Karnataka**  
<http://www.bvb.edu/education-research.html>



Collaborative **R**esearch in **E**ducation, **A**ssessment and **T**eaching  
 Environments for STEM

**Michigan State University**