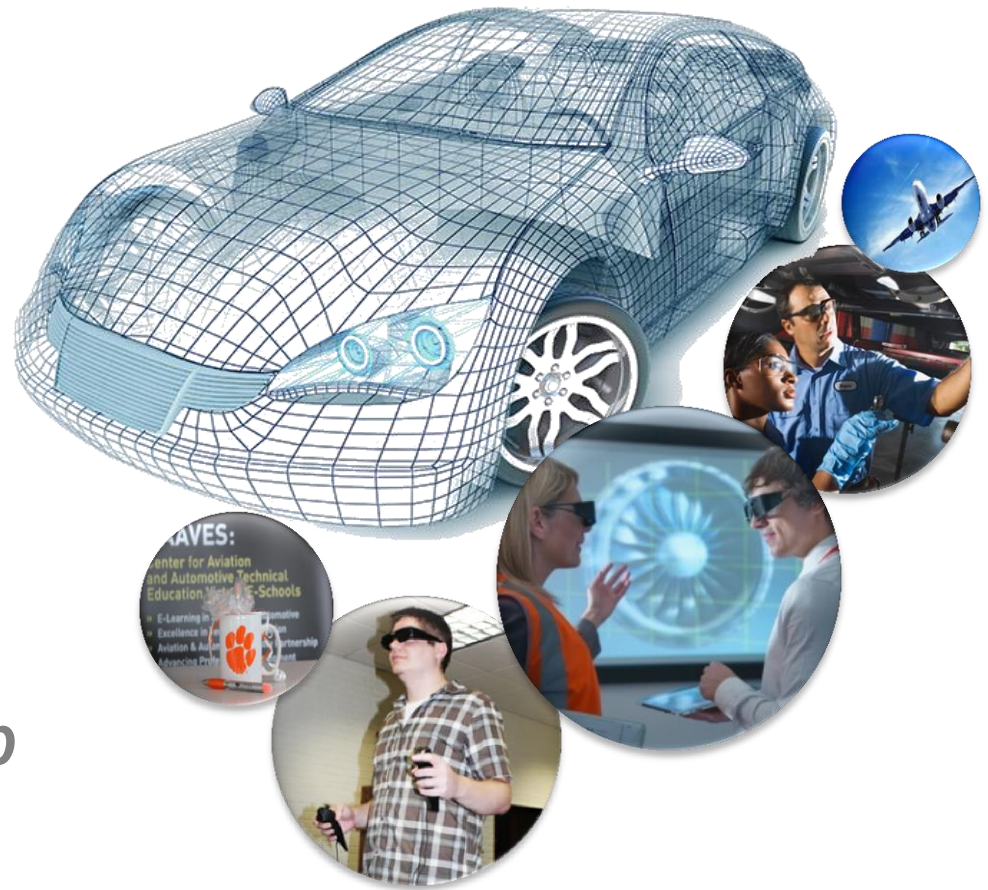# Digitally Supported Pathways Transitioning Students Into STEM Fields
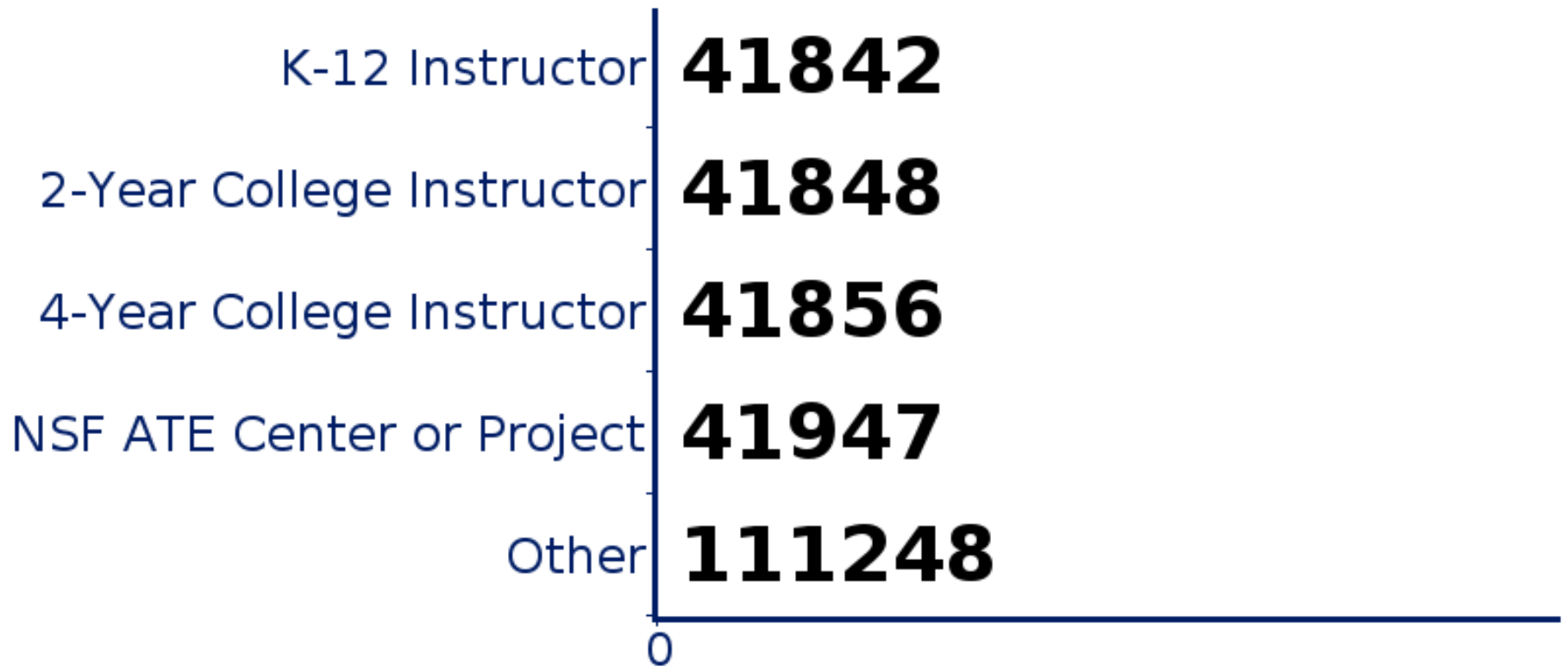
STEM Smart Workshop
May 12th, 2014

Please select the option that best describes your occupation:

You may respond at **PollEv.com** when the presenter pushes this poll
 Text a **CODE** to **37607**

Option	
K-12 Instructor	**41842**
2-Year College Instructor	**41848**
4-Year College Instructor	**41856**
NSF ATE Center or Project	**41947**
Other	**111248**

0

Total Results: 0

CUCWD

Clemson **U**niversity **C**enter for **W**orkforce **D**evelopment

Increasing employment and economic growth by building pathways, creating and maintaining strategic partnerships and developing and disseminating digital learning resources.

CA²VES

Center for **A**utomotive and **A**viation **V**irtual **E**-**S**chools

Advancing aviation, automotive, and manufacturing technician education to support workforce preparedness and economic development.

Employment Opportunities

STEM:
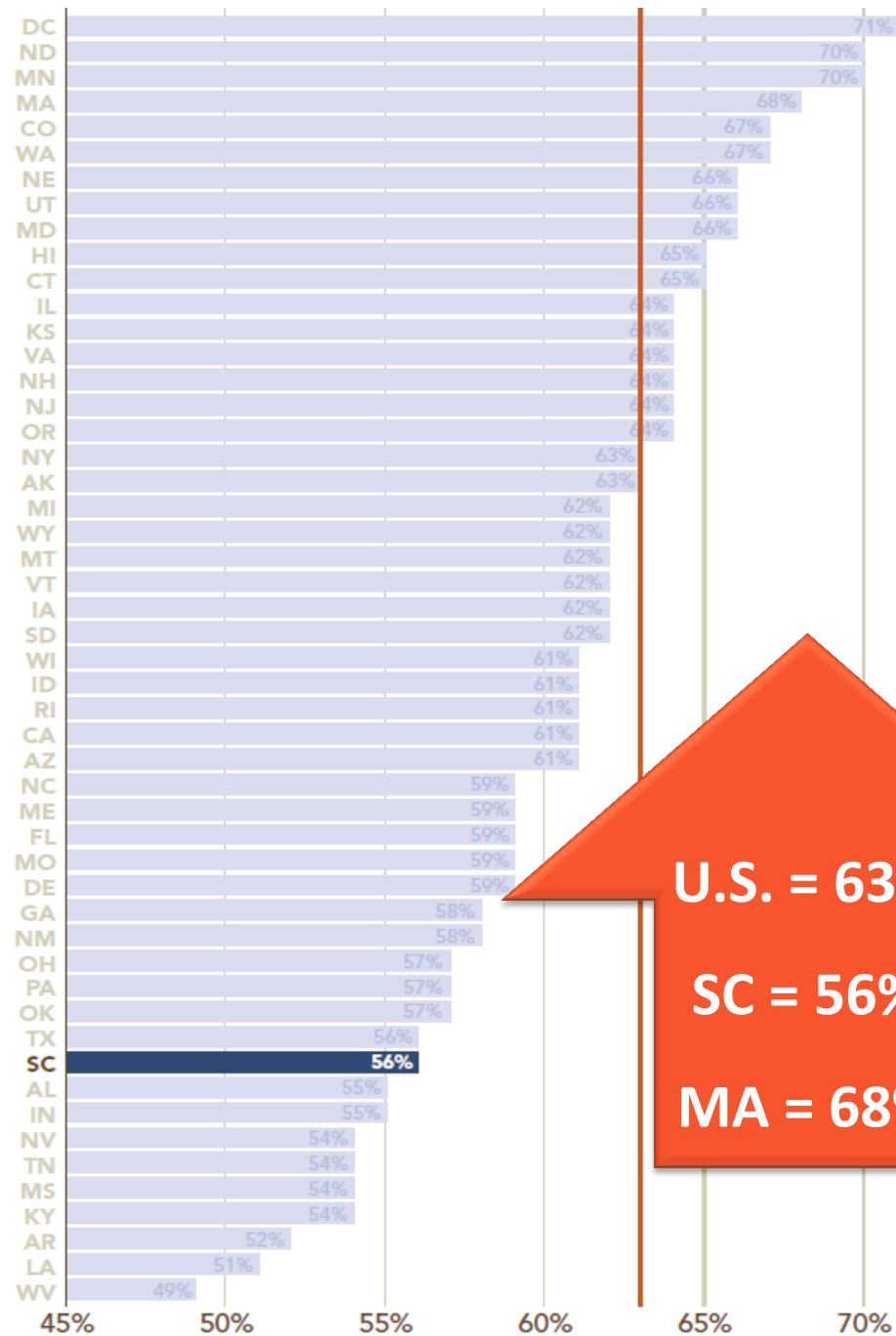**1.8 jobs** for every
1 unemployed person

JOB   JOB

Non-STEM:
5.0 unemployed
people for every **1 job**

JOB

Educational Requirements for STEM Fields by 2018

State	Percent
DC	71%
ND	70%
MN	70%
MA	68%
CO	67%
WA	67%
NE	66%
UT	66%
MD	66%
HI	65%
CT	65%
IL	64%
KS	64%
VA	64%
NH	64%
NJ	64%
OR	64%
NY	63%
AK	63%
MI	62%
WY	62%
MT	62%
VT	62%
IA	62%
SD	62%
WI	61%
ID	61%
RI	61%
CA	61%
AZ	61%
NC	59%
ME	59%
FL	59%
MO	59%
DE	59%
GA	58%
NM	58%
OH	57%
PA	57%
OK	57%
TX	56%
SC	56%
AL	55%
IN	55%
NV	54%
TN	54%
MS	54%
KY	54%
AR	52%
LA	51%
WV	49%

U.S. = 63%

SC = 56%

MA = 68%

Employment Opportunities

US Manufacturing Sector is the Tenth-Largest Global Economy
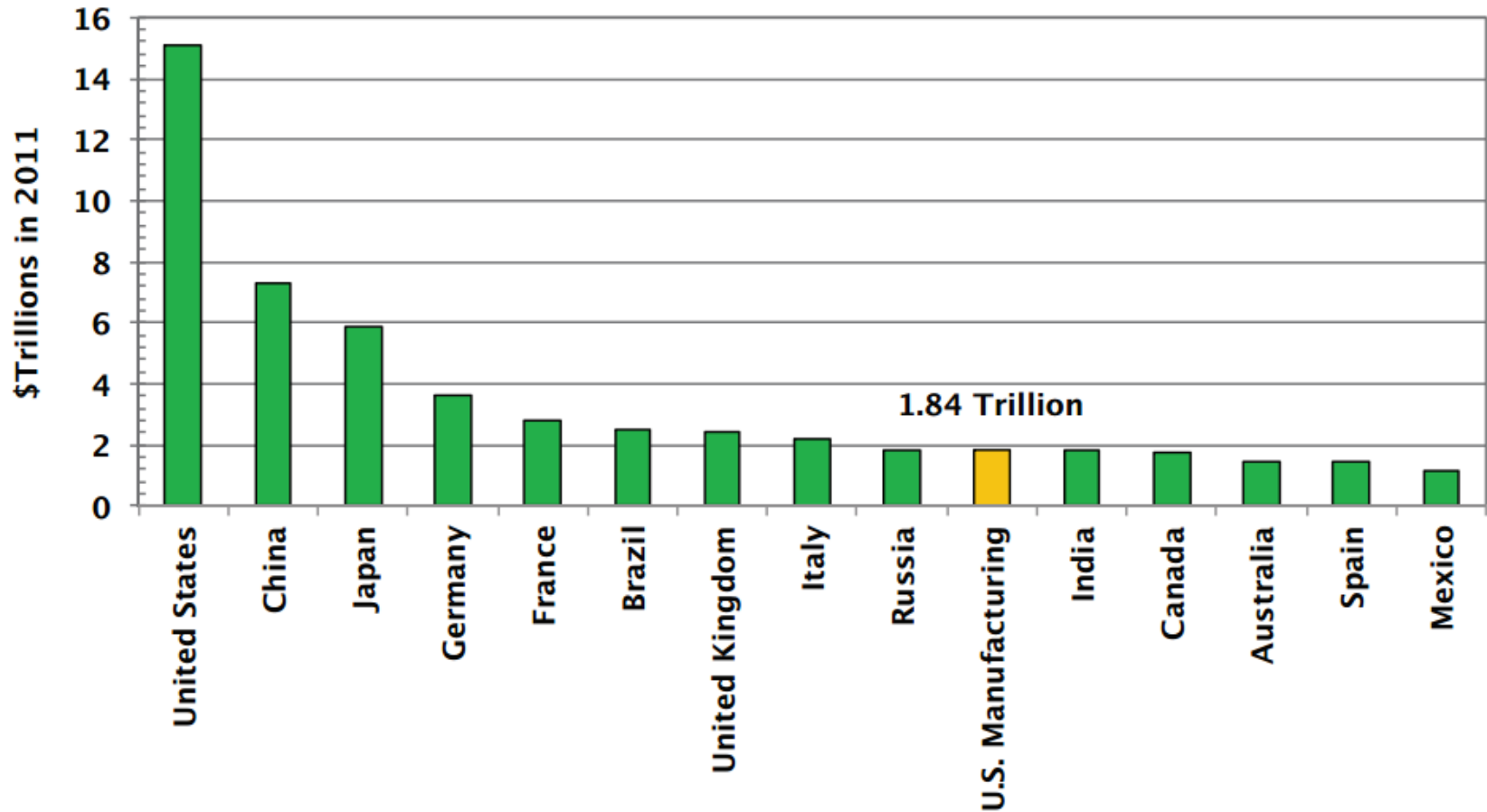
Employment Opportunities

Manufacturing Sector Employment by Education
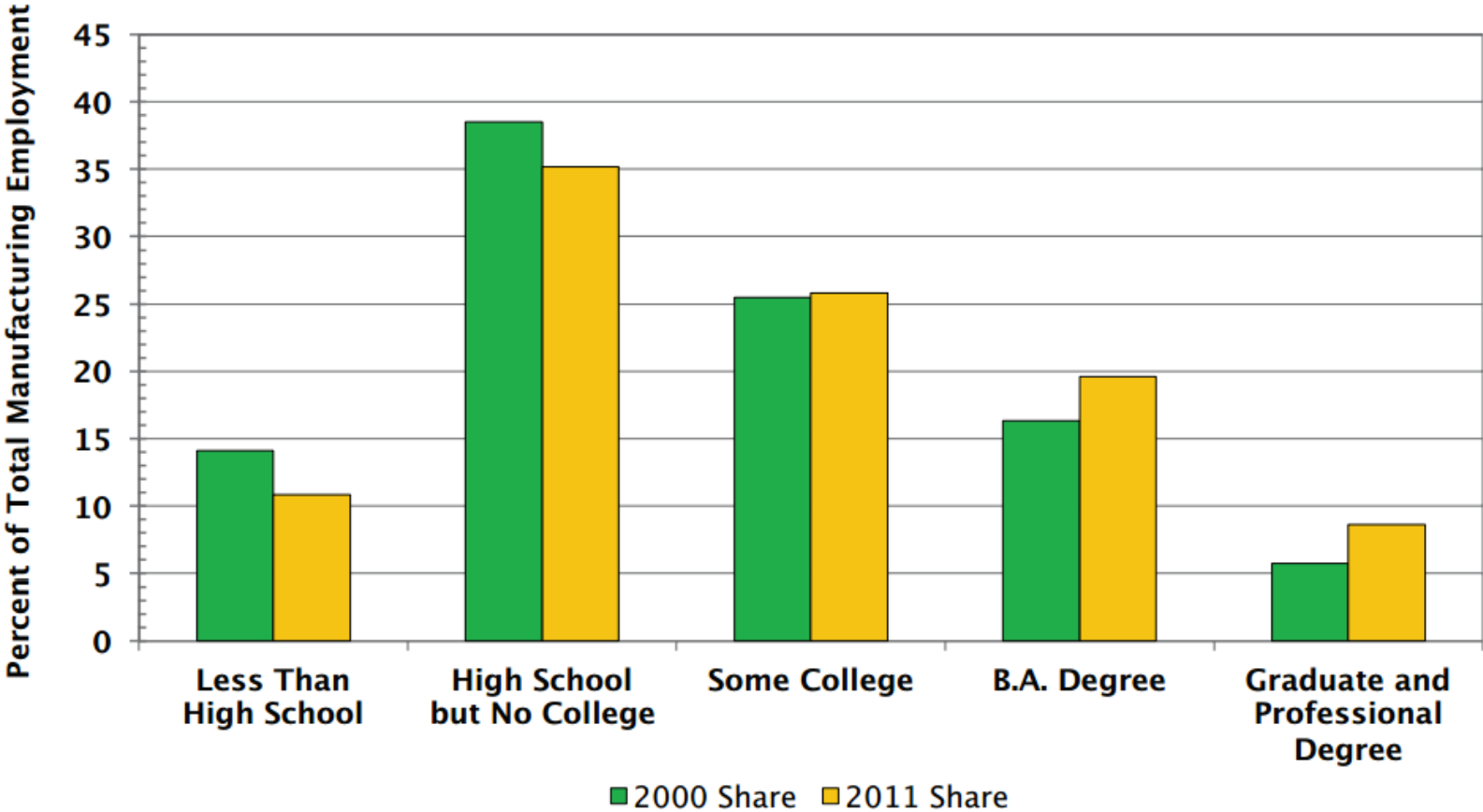
Barriers to Manufacturing Pathways

- Lack of support for advanced manufacturing career pathways

Manufacturing in the past

1. Negative perceptions of manufacturing occupations

2. Emphasis on 4-year degrees

3. Lack of resources including funding, technology, instructor experience

Manufacturing Today

- There is a greater need for innovation in the U.S. to maintain global competitiveness

CUCWD CAVES

Discussion

Developing Pathways into STEM Fields

Identify some barriers that impact the recruitment of students into your STEM field.

You may respond at **PollEv.com** when the presenter pushes this poll

Text **115176** and your message to **37607**

CUCWD CAVES

STEM Pathway Development Plan
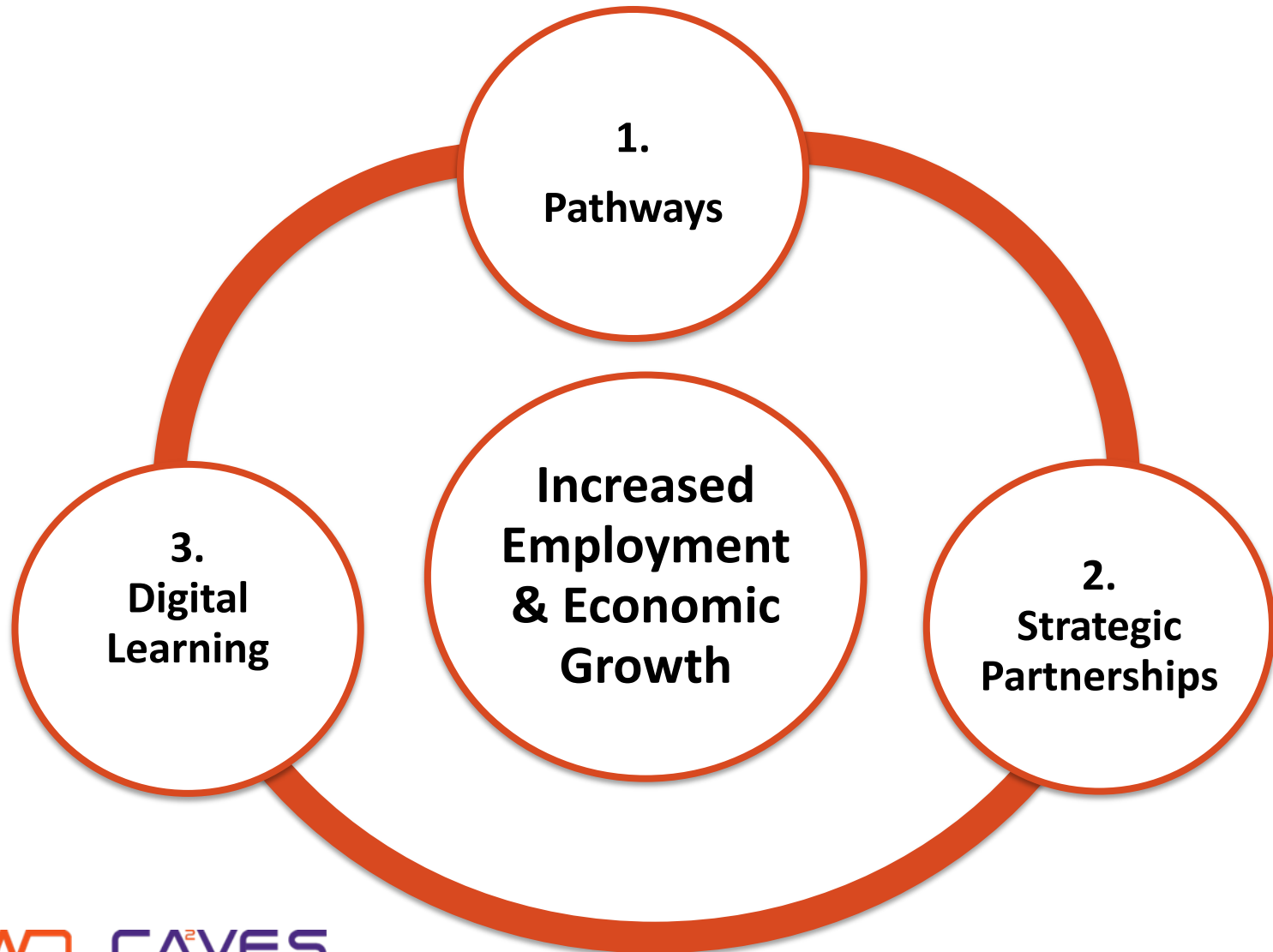
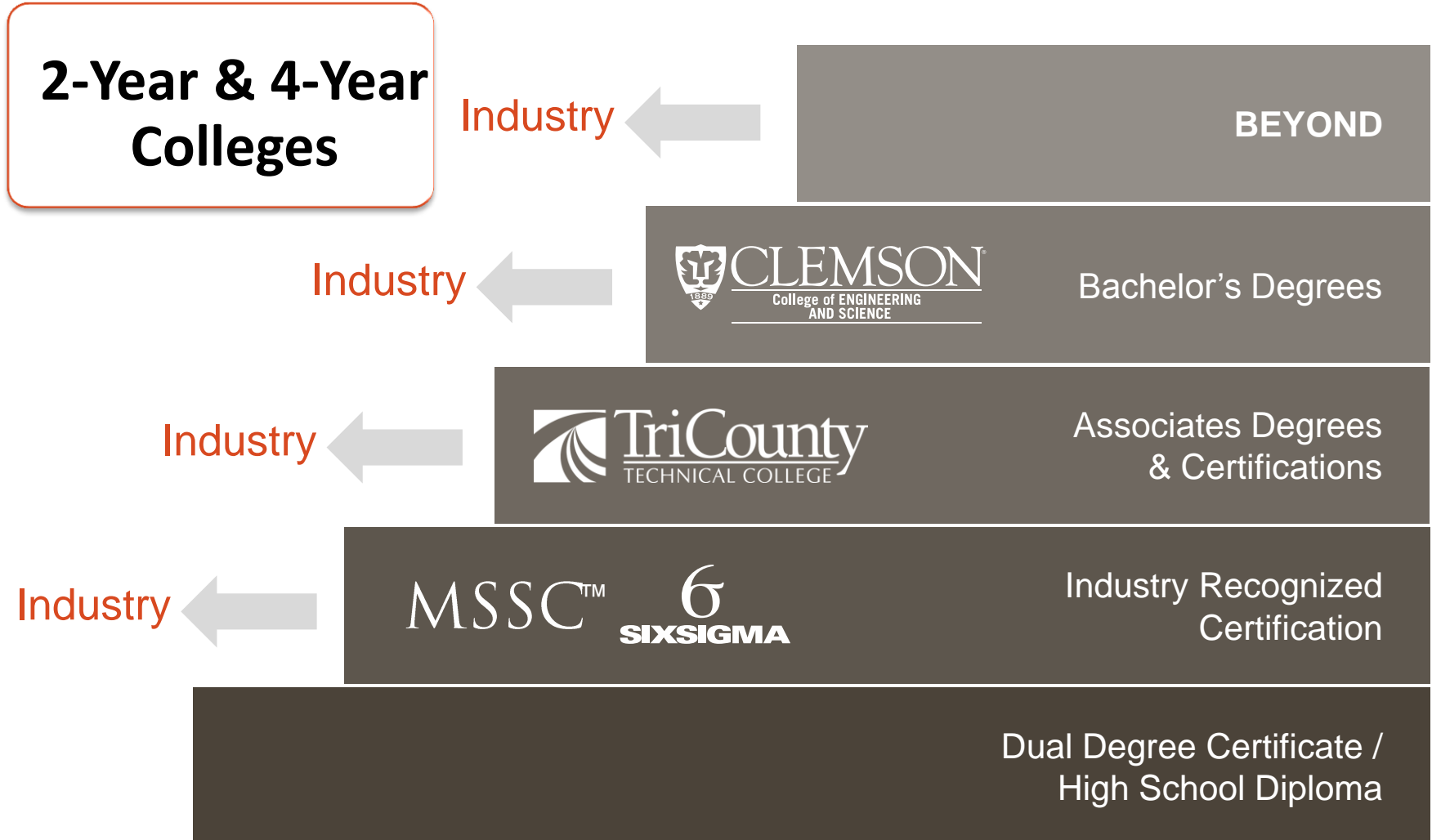# 1. Pathway Development
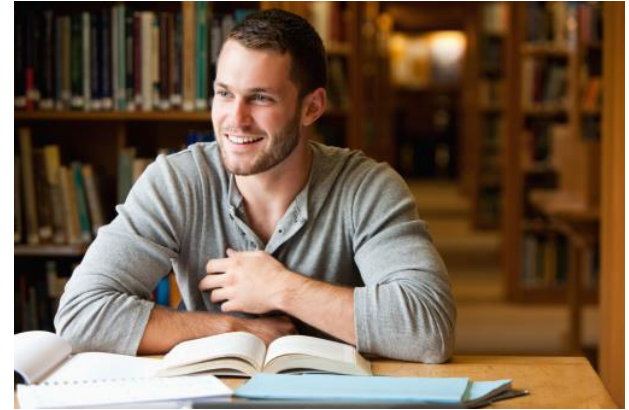
"A lifelong educational journey."

```
P-12  →  2-Year Colleges  →  4-Year Institutions  →  Industry
```

- P-12
- 2-Year Colleges
- 4-Year Institutions
- Industry
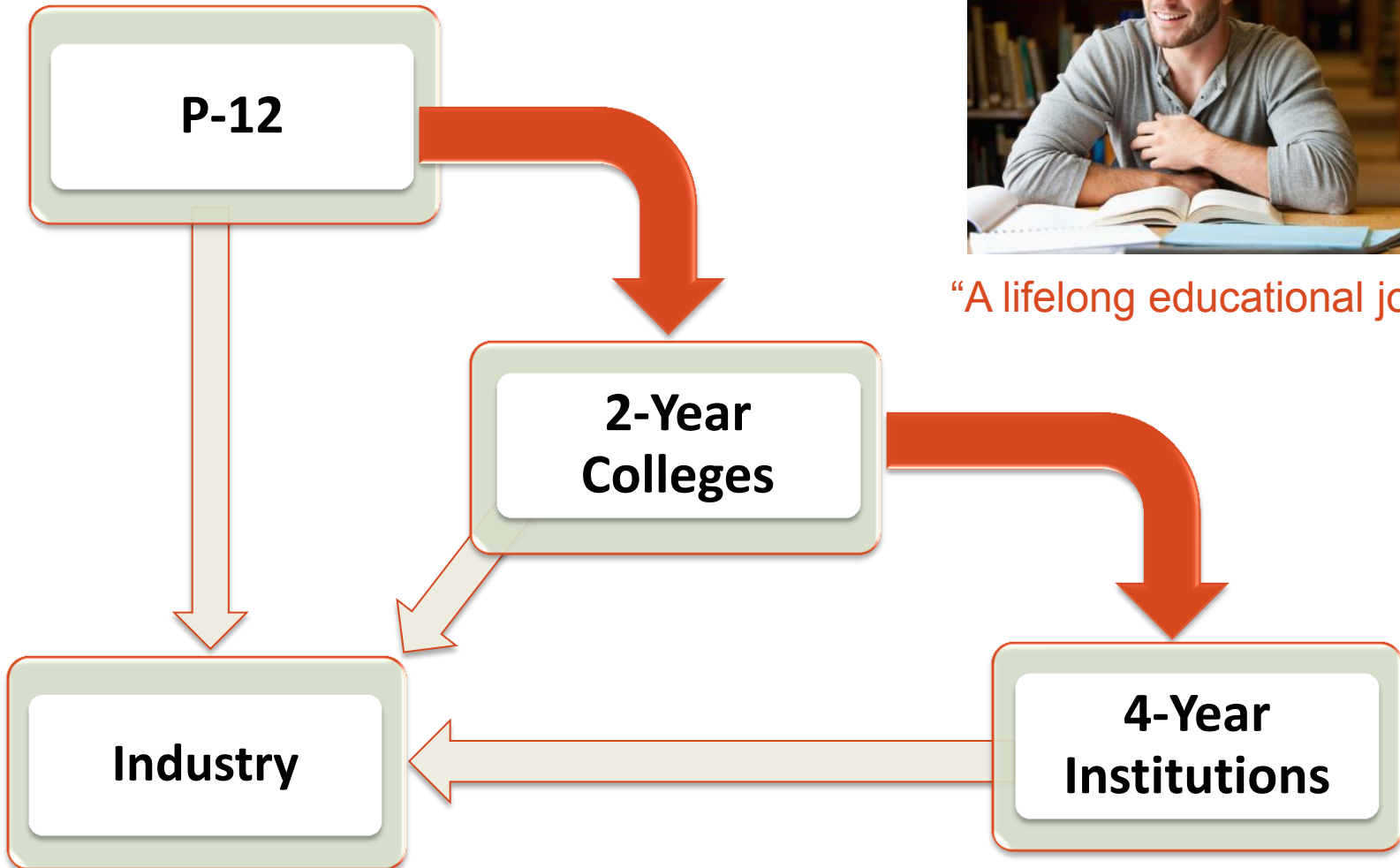
Pathway Development

P-12

- Elementary → *Introduction*
- Middle → *Exploration*
- High → *Immersion*

Pathway Development

2-Year & 4-Year Colleges

Industry ←

BEYOND

Industry ←

CLEMSON
College of ENGINEERING AND SCIENCE

Bachelor's Degrees

Industry ←

TriCounty
TECHNICAL COLLEGE

Associates Degrees & Certifications

Industry ←

MSSC™ 6 SIXSIGMA

Industry Recognized Certification

Dual Degree Certificate / High School Diploma

CUCWD CAVES

Discussion

Developing Pathways into STEM Fields

Name some methods for overcoming barriers related to pathway development initiatives (i.e. Developing articulation agreements, Involving industry in student recruitment, etc.)

Text **6160** and your message to **37607**   Submit responses at **PollEv.com**

2. Strategic Partnerships

P-20 Partners

- Local P-12 School Districts

- All 16 Two-Year Colleges in SC

Strategic Partnerships

Government Partners

- SC Technical College System
- SC Department of Commerce
- Department of Education
- Personal Pathways to Success
- AOP Economic Development Offices
- SCMEP
- Vocational Rehab
- Economic Development

Strategic Partnerships

Industry Partners

- BMW
- Michelin
- GE
- Honda
- Boing
- Milliken
- Duke
- Fluor

Bryan Dods - GE

Werner Eikenbusch - BMW

Strategic Partnerships

Other Partners

- South Carolina Advanced Technological Education (SC ATE)
- Consortium for Alabama Regional Center for Automotive Manufacturing (CARCAM)
- Automotive Manufacturing Technical Education Collaborative (AMTEC)
- Florida Advanced Technological Education (FLATE) Center
- South Carolina Coalition for Math and Science (SCCMS)
- SC STEM collaborative
- Programs for Educational Enrichment and Retention (PEER) Women in Science and Engineering (WISE)

Discussion

Developing Strategic Partnerships

Identify some challenges and possible solutions associated with developing strategic partnerships that bridge the gap into STEM fields.

Text **43356** and your message to **37607**

Submit responses at **PollEv.com**

3. Digital Learning

AMPA (Advanced Manufacturing Production Associate)

- General Competencies — Work Keys & Work Ready Communities
- Safety — OSHA
- Quality — 6 Sigma Yellow Belt
- Maintenance
- Manufacturing
- Green Manufacturing

A^2 (Automotive & Aviation)

- Intro to Metrology
- Basic Electricity
- Engines
- Hydraulics & Pneumatics
- Fuel Systems
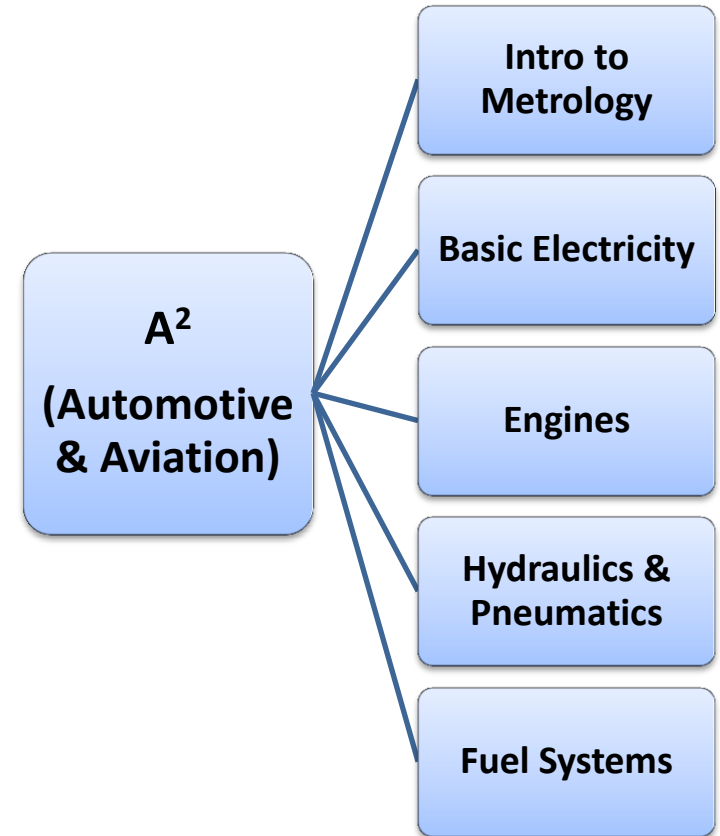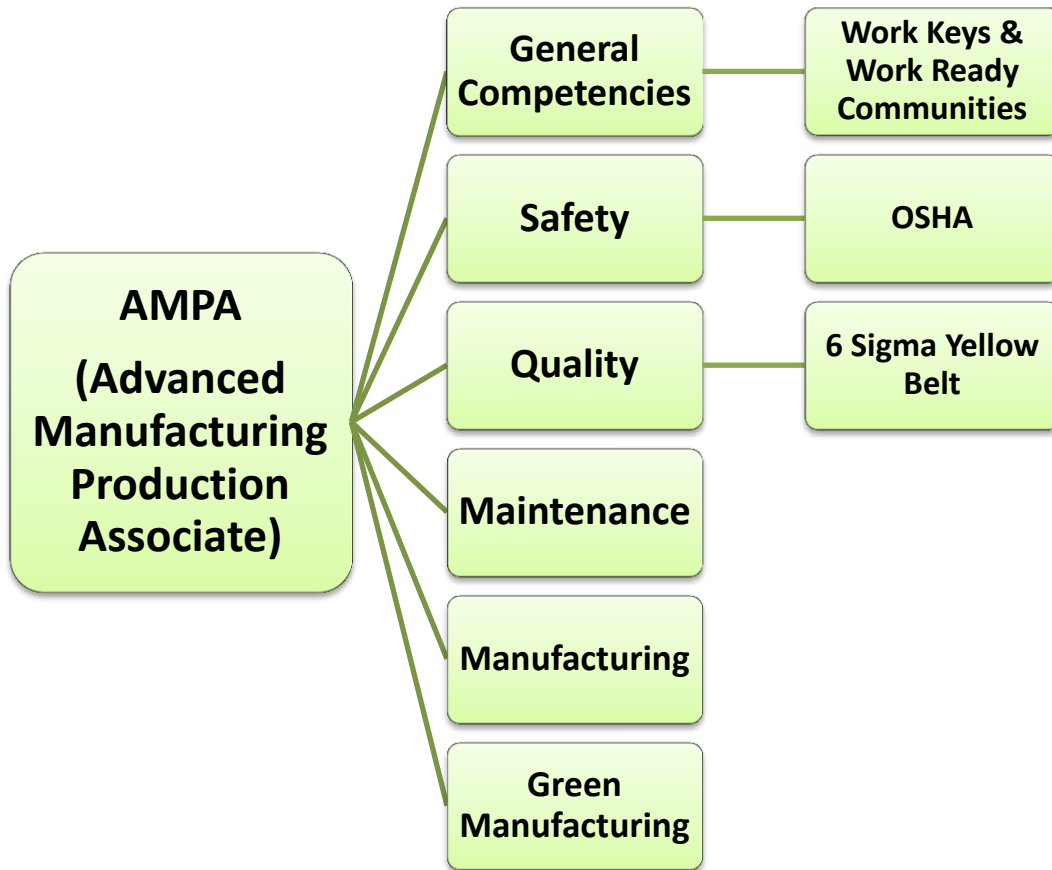
CA²VES Curriculum

Outline

Open Text - Content

Mini-Video Lectures

Assessment Guide

Virtual Reality

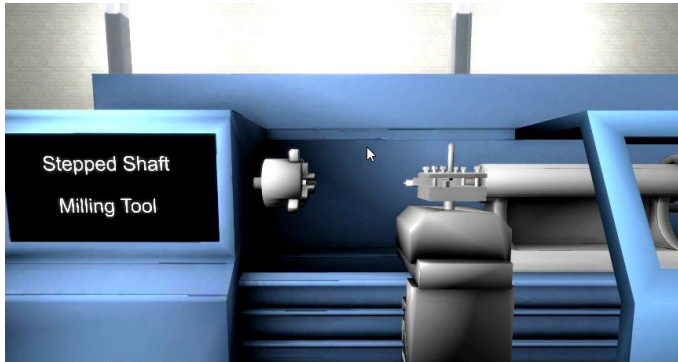CUCWD CA²VES

CA²VES Virtual Reality

Repeat the steps you learned in the guided practice to grind the top surface of the metal block.

For educational use only

For educational use only

Stepped Shaft

Milling Tool

This simulation is designed to introduce you to the CNC Lathe.
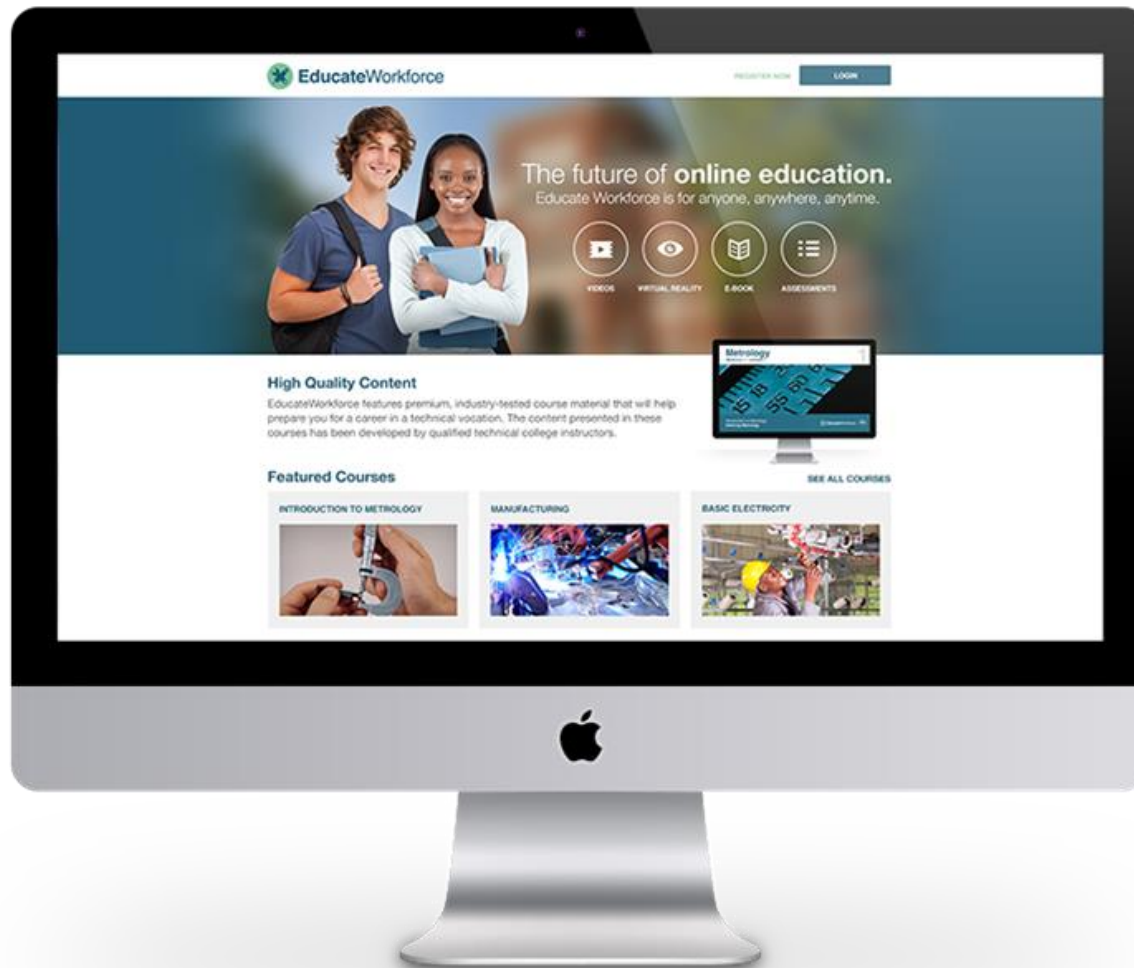
Previous

Next

For educational use only

You hear a clanging noise emitting from the gears

Previous

Next

For educational use only

CUCWD CA²VES

EducateWorkforce.com

Discussion

Online or hybrid learning in STEM fields

Identify some challenges and possible solutions associated with adapting STEM courses with hands-on components into online or hybrid formats.

You may respond at **PollEv.com** when the presenter pushes this poll

Text **111471** and your message to **37607**

Trends in Tools and Resources

Supporting Implementation of OPEN Digital Curriculum

Mobile Applications for the Classroom

Air Sketch
(iPad)

ShowMe
(iPad)

iTunesU
(iPad)

Adobe Connect   (iOS and Android)

MyHomework
(iOS, Android, Windows, Kindle)

iBook
(iOS)

Khan Academy   (iPad)

Dropbox
(iOS, Android, Windows, Kindle)

Notesplus
(iPad)

Wolfram|Alpha
(iOS)

StudyBlue
(iOS, Android, Windows, Kindle)

iAnnotate
(iOS)

Wunderlist
(iOS, Android, Windows, Kindle)

Evernote
(iOS, Android, Windows, Kindle)

Ted and Ted Books
(iOS)

Quick Office
(iOS, Android)

[PBS](PBS)

(iPad)

NASA App HD
(iOS, Android)

Mindomo
(iOS, Android)

SlideShark
(iOS)

Mental Case
(iOS)

*** Click on the App Names to view a description and the APP Icons to view a video**

Air Sketch

Need a recordable whiteboard?
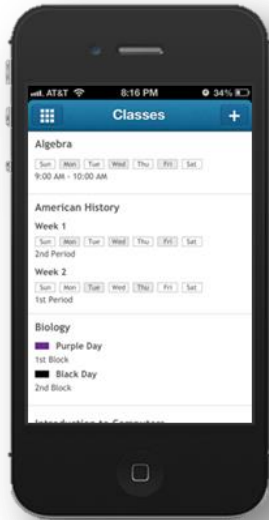Try [Vittle](#) or [ShowMe](#) !

iAnnotate

MyHomework

Homework
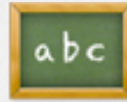Track your homework, tests, projects and lessons.

Class Schedules
Supports time, block and period based schedules.

Reminders
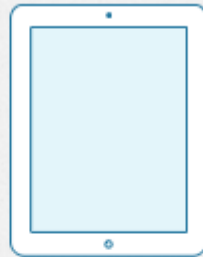Get reminded when assignments are due.

Sync
Sync to access your classes and assignments on any of the available devices!
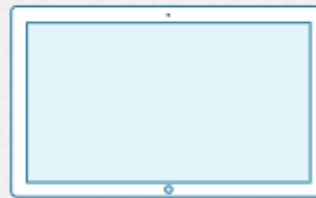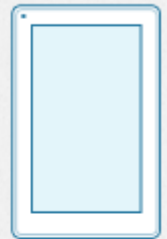
iPhone   Android   iPad   Windows 8   Web   Kindle

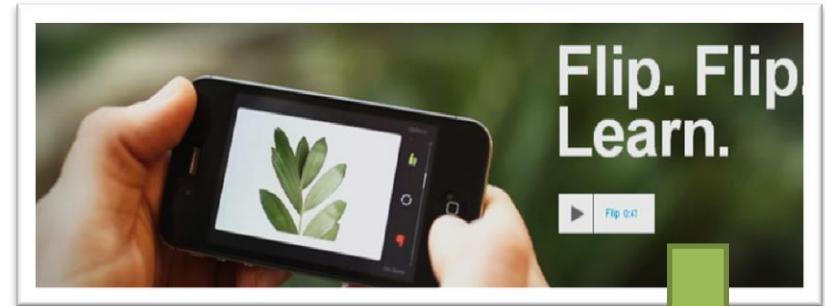**Teachers.io** = share class information with students synced through MyHomework

StudyBlue

Evernote

Flip. Flip.
Learn.
▶ Flip Out

STUDYBLUE + Evernote.
You've successfully connected Evernote to your STUDYBLUE account.

▾ Notebooks
📗 All Notes (31)
▾ 📗 StudyBlue
  📗 Economics 101 [4]
  📗 Journalism
  📗 Journalism 565 (1)

Economics 101
My Study Materials
TITLE
📗 Chapter 13.3
📗 Chapter 13.2
📗 Chapter 13.1

Econ Chapter 13.2
Industry Supply Curve
The relationship between t
as a whole.

Chapter 133
industry supply curve the relationship
industry as a whole.

Industrial
Supply
Curve
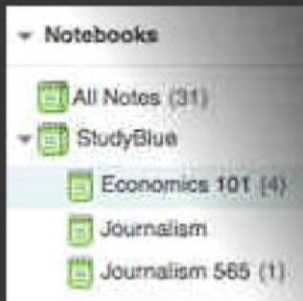
Evernote class notebooks sync with StudyBlue to import your study materials.

StudyBlue creates class notebooks in your Evernote account.

Copy & paste your original notes onto digital flashcards.

Study online or on your iPhone or Android. Track your progress and get reminders.

Open Educational Resources - E-Texts

OpenStax College

Connexions

College Open Textbooks

University of Minnesota

WikibooksBoundless

CK12 Flexbooks

The Saylor Foundation

Flatworld Knowledge

Orange Grove Text Plus

The value of education

Click on the E-Text Names to view a description

OER – Open Educational Resources

OER Repositories:

- [SBCTC OERs (Washington State Board) Open Course Library](#)

- [NROC – National Repository of Online Courses](#)

- [Curriki](#)

- [OER Commons](#)

- [Open Source Physics](#)

- [PHET Interactive Simulations](#)

- [Open Learning Network (OLNet)](#)

OER Resources:

- [OER Matrix](#)

- [Order of Operations OER Creation](#)

- [Quality Matters Rubric](#)

- [Learning Registry](#)

- [OER-Friendly Tools & Resources](#)

- [Scoop It](#)

- [Wikimedia](#)

- [Open Policy Implementation Guide](#)

Click on the OER Names to view a description

Discussion

Digital Tools and Resources

Name a resource you have used or are familiar with that supports the implementation of Digital Curriculum

You may respond at **PollEv.com** when the presenter pushes this poll

Text **112762** and your message to **37607**

Questions

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Director of Digital Learning
CUCWD

Caroline Christ
Digital Learning Experience Designer
CUCWD