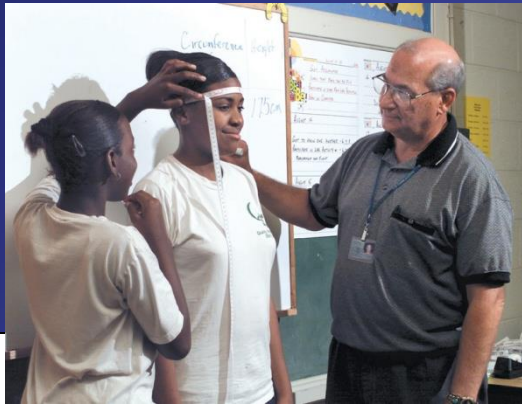


# Successful STEAM initiatives – possible partnerships criteria and mechanisms to guide public policy



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CENTER FOR OCCUPATIONAL RESEARCH AND DEVELOPMENT

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# Center for Occupational Research and Development

ABOUT CORD



# CORD Mission

The Center for Occupational Research and Development (CORD) is a nonprofit organization dedicated to **leading change in education**. Since 1979, we have created educational tools and innovative programs to empower faculty and prepare students for greater success in **careers and higher education**.

# JOB<sup>S</sup> LOST GAINED CHANGED

## Scenarios for automation adoption, 2016–30

Under midpoint scenario, % of work hours with potential to be automated



Workers displaced under midpoint automation scenario: **400M**

## SWITCHING OCCUPATIONS...

**75M–375M**

Number of people who may need to switch occupational categories by 2030, under our midpoint to rapid automation adoption scenarios



**For the U.S.:**  
**1/3 of 2030 workforce** would require reskilling or upskilling

## ...DEMANDING NEW SKILLS...



**>> 8 to 9% of 2030 labor demand will be in occupations that don't yet exist**

MCKINSEY GLOBAL INSTITUTE

McKinsey & Company



# Career

**Secondary  
Education**  
(Traditional  
Pipeline)

**Adult  
Education**  
(Re-entry  
Pipeline)

**Postsecondary  
Education**  
(Certificates  
and AAS)

**Postsecondary  
Education**  
(B.A./B.S. and  
beyond)

# Pathways

Support student transitions  
Offer multiple entry and exit points  
Eliminate barriers to completion  
Communicate systemic change  
Build culture of learner success

# Partnerships to Prepare for Future of Work

- **Employers** – across sectors; collaborate as a team on everything from curriculum to work-based learning experiences; build your community's talent pipeline
- **Schools/school districts** – secondary and postsecondary/regional community; align, accelerate, advance; remove barriers
- **State coordination** – to help academic and CTE faculty as content development partners: interdisciplinary connections, real-world context, employability skills across curriculum



# Some CORD Bus-Ind Partners

Honda Motor Co.  
Toyota Motor Sales,  
USA, Inc.  
The Boeing Company  
Fred Meyer Inc.  
Donaldson Company

Caterpillar Inc.  
Siemens  
IMCA SA  
Motorola, Inc.  
Pratt & Whitney  
Embraer

# Potential Partners' Return on Investment

## College Leaders:

- Reduce remedial course enrollment
- Enhance student engagement
- Increase credential and degree attainment

## Employers:

- Increase access to qualified workers
- Shorten new employee orientation times and reduce expenditures
- Increase productivity
- Reduce recruitment costs and turnover

## Economic Development and Workforce Leaders:

- Enhance labor pool to retain and attract employers
- Increase income levels in the community
- Drive economic growth and improve quality of life

ROI



# Algunos Proyectos

**Business Initiative for Technical Education**

(BITE or IEET in Spanish language) @  
Loyola Polytechnic Institute in the DR

**Preparing Technicians for the Future  
of Work** (CORD-led NSF ATE initiative)

**Pathways to Credentials** (US DOE's Office  
of Career Technical and Adult  
Education)

## 1. IEET Basic Level

- Foundation of science/math courses taught in workplace context.
- Employability skills to give graduates advantages when joining work environments and/or pursuing postsecondary education.

## 2. IEET Advanced Level

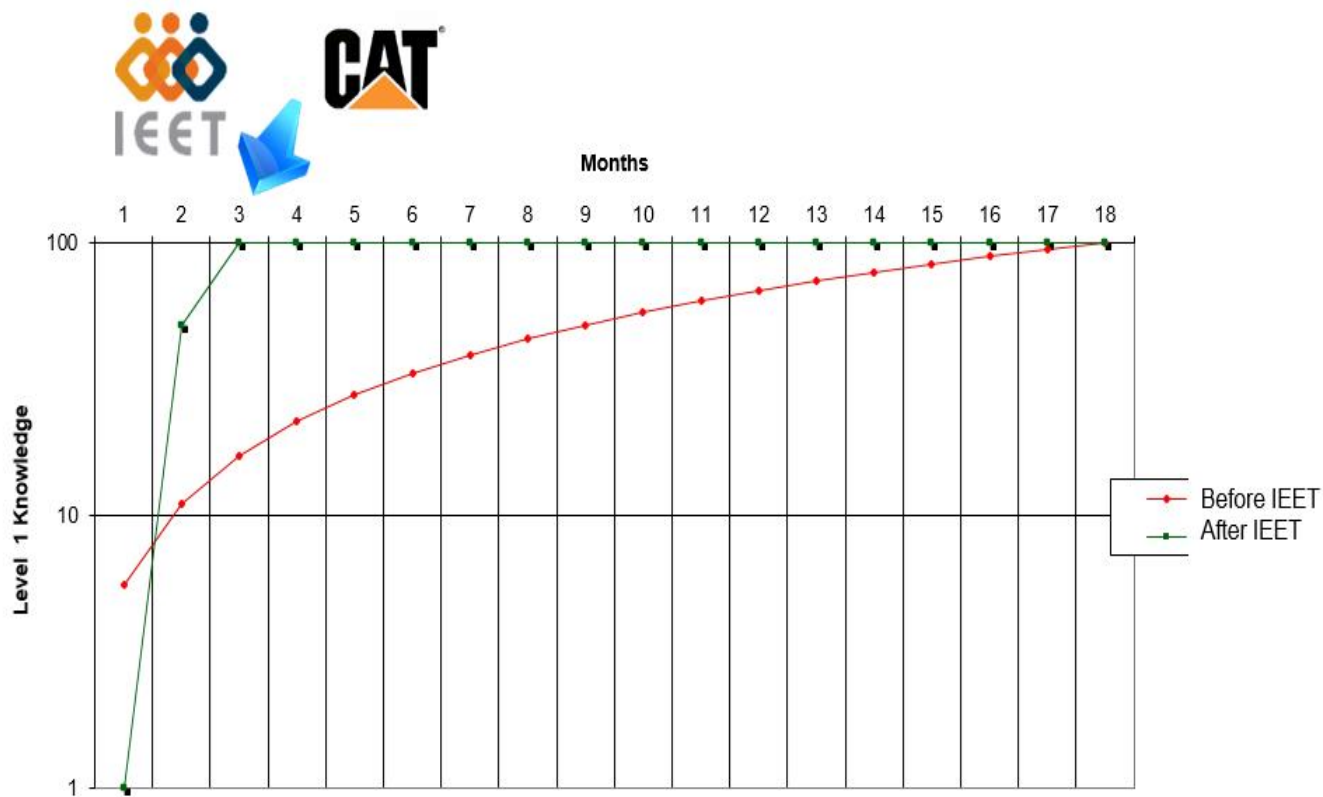
- Incorporate business processes into the classroom settings
- Allow students to use tools and technology according to business/industry's current needs



# Technical Training Curve Evolution

IMCA

CAT



Decreased training curve  
of New Hires from  
**18** months to **3** months



# The Business Initiative for Technical Education (BITE)

Creating shared value, boosting a country

8

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Received 11 June 2016

Revised 26 October 2016

Accepted 2 December 2016

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## Abstract

**Purpose** – This paper aims to explore the creation of shared value (Porter and Kramer, 2011) through technical education by analyzing key events and factors associated with the midsize firm IMCA and the

# Preparing Technicians for the **FUTURE OF WORK**



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# Preparing Technicians for the **FUTURE OF WORK**

## Project Rationale

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Partnerships among employers and educators have never been more important as the country faces significant challenges in the preparation of its future workforce. Technology advances are changing industries at an unprecedented pace, demanding an expanding array of knowledge, skills, and abilities from technicians in the STEM disciplines. The workplace is undergoing a major transformation driven by the ongoing evolution of artificial intelligence, the internet-of-things, cybersecurity procedures, advanced robotics, digital design and prototyping, and the way in which these and other changing technologies interact within horizontally and vertically integrated systems.

The National Science Foundation has established “The Future of Work at the Human Technology Frontier,” (NSF, 2016) as one of its 10 Big Ideas; a collective vision to prioritize NSF investments that “push forward the frontiers of U.S. research and provide innovative approaches to solve some of the most pressing problems the world faces.” America’s technicians are already being affected by this transformation and they require our urgent and earnest attention.



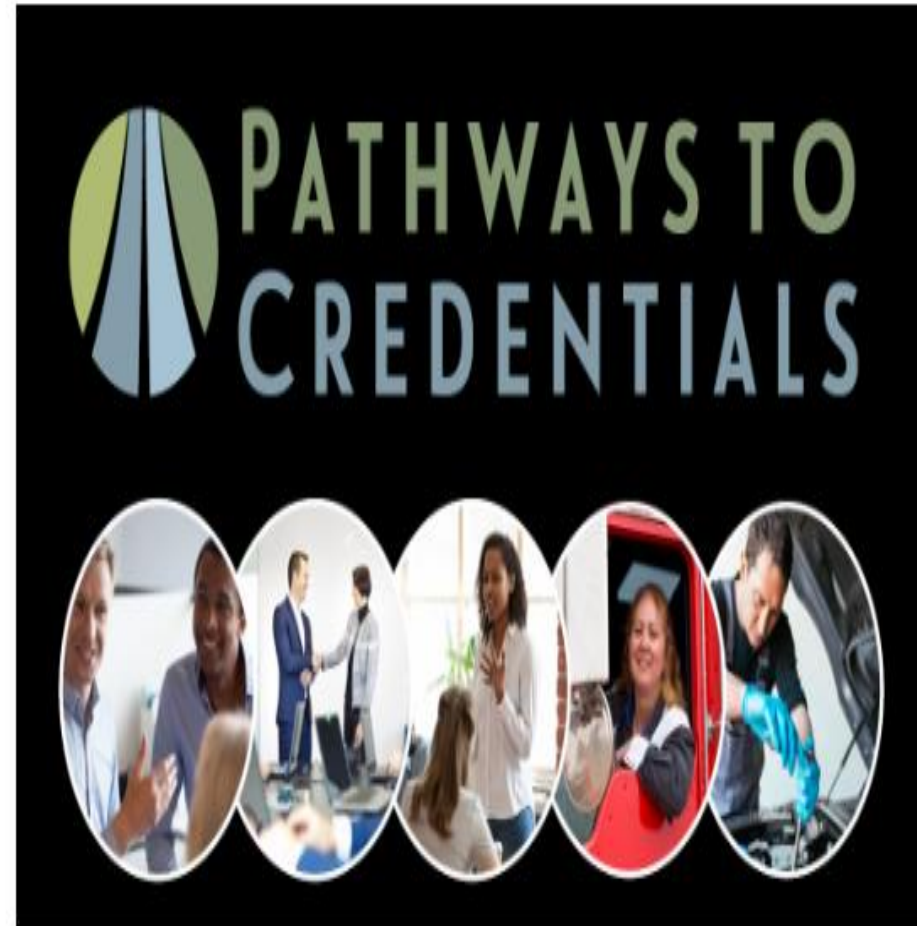
## Overarching Project Mission:

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Enable the NSF-Advanced Technological Education (ATE) community to collaborate regionally with industry partners, within and across disciplines, on the transformation of associate degree programs to prepare US technicians for the Future of Work.

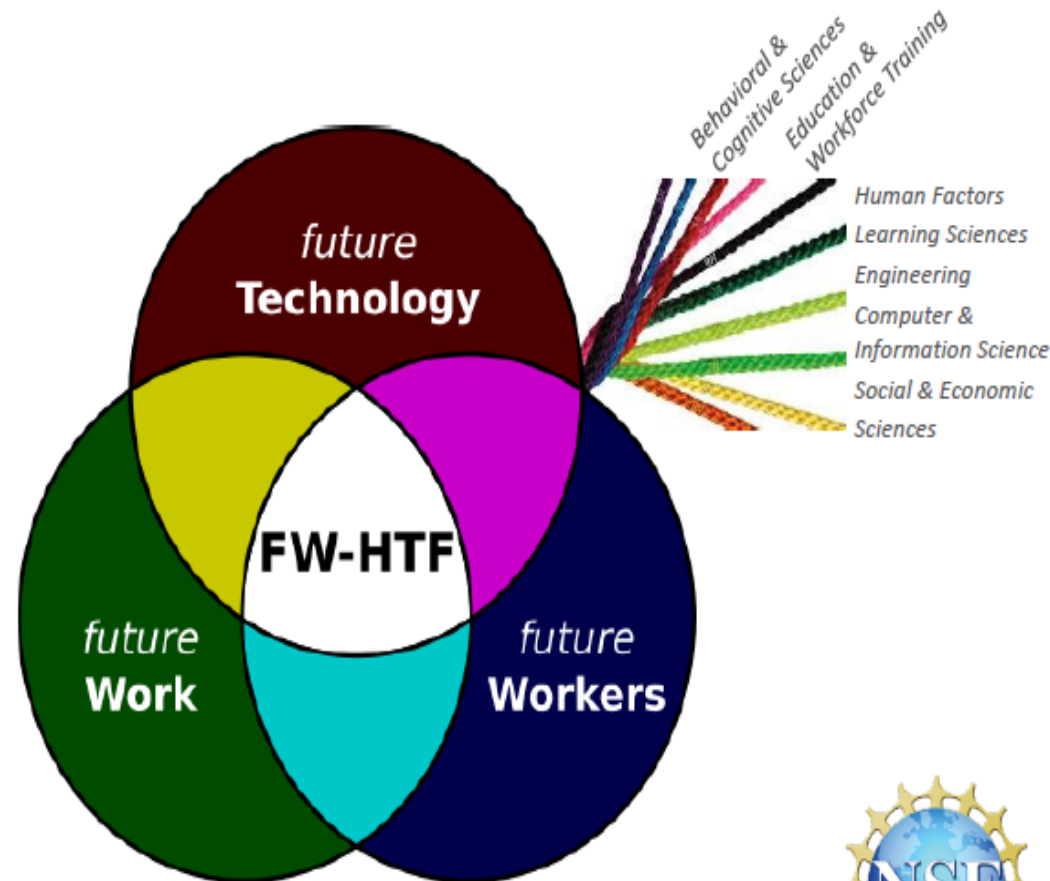
## Pathways to Credentials

*Pathways to Credentials* is an initiative of the US Department of Education's Office of Career Technical and Adult Education. The project is designed to assist community and technical colleges in their efforts to embed stackable, industry-recognized credentials within technical (CTE) associate degree programs. A cohort of 10 community colleges has been selected to receive customized technical assistance to advance their efforts in stackable credential design including components such as employer engagement, industry certification alignment, and non-credit/credit integration. **Learn more.**



# FY19 The Future of Work at the Human-Technology Frontier

- **Future Workers:** Addresses the worker as an individual or in small teams, including education and training
- **Future Technology:** Engineering and computer science technologies to develop the human-technology partnership in future workspaces (office, classroom, warehouse, farm, and factory)
- **Future Work:** Considers a societal, economic, professional, occupational, industrial, or national context



**Thanks a lot**  
**Muito obrigado**