

A Digital and Blended Learning Ecosystem for the Workforce of the Future

**OAS: INTER - SECTORAL WORKSHOP ON “SKILLS FOR THE
FUTURE: COORDINATION BETWEEN MINISTRIES
OF EDUCATION AND LABOR” , Santiago de Chile**

May 17, 2019

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Abdul Latif Jameel World Ed



At a time when the workforce is facing changing demands, and employment is being usurped....





Newport News
Shipbuilding



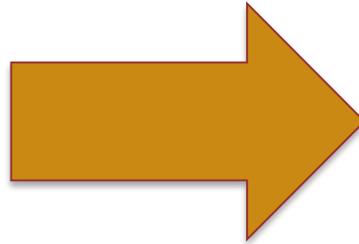
Augmented Reality Program

- **SAFETY:** Highlight critical safety information in a challenging work environment
- **OPERATIONS:** Bring the ship to life in a new way by revealing data while it is in context
- **MAINTENANCE:** Enable every sailor to become a quick expert on complex systems
- **TRAINING:** Train new operators by overlaying instructions on complex equipment

The Future of the CLO



Trainer



Transformer

Three transformations

Goals

Compliance →
Enablement

Skills → Capabilities
and culture

Order-taking →
Partnership

Methods

Personalized
Small bits, Just-in-time
Digital + Blended
Simulation, Scenarios
Multi-modal
Peer learning

*Instruction,
Introspection, Immersion*

Learning Unit

Smaller, more agile
Creation → Curation
Experience design
Peer/expert teacher
enablement
New staff roles
Performance focus

Disruptive Innovation for Quality @ Scale

Supply

Digital Learning
Innovation across supply
chain of education

- Lectures, Labs Credentials

- Learning Science
 - Cognitive Tutors for Adaptive Learning
- Alternate Pathways
- Data used to improve learning
- The Open Movement
- A new ecosystem for learning

Changing the World of Learning

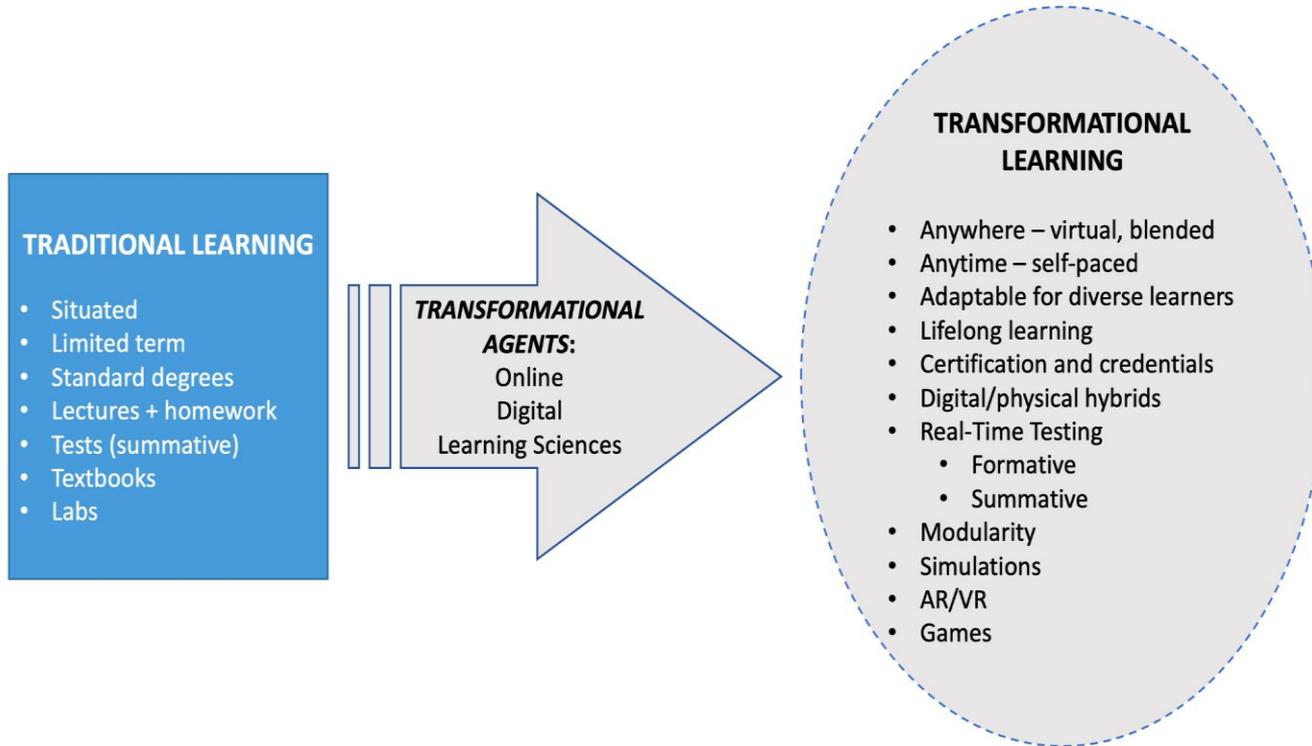


Demand:

- Worldwide demand for well-educated workers
- Cost of education
- Rapidly changing knowledge and skills
- New Generation of Diverse learners
 - Non-Traditional Displaced

Changing the World through Learning

Every element of teaching/learning is transforming



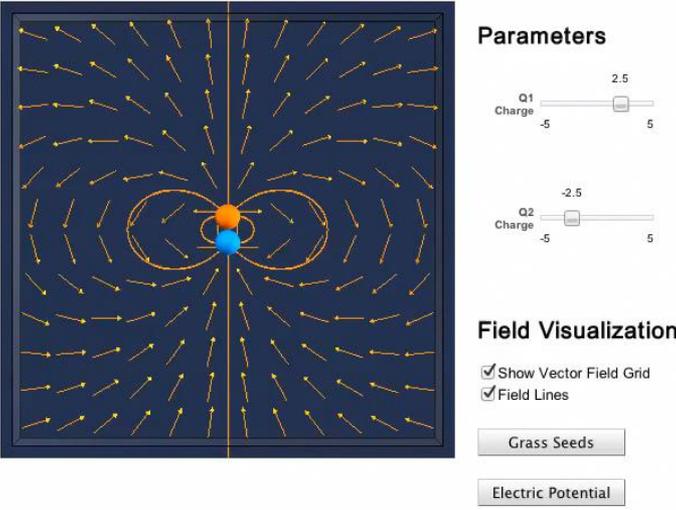
Interactive Simulations (Physics)

TEALSim Exploration: Point Charges

This simulation illustrates the field pattern created by two point charges with opposite signs of charge. In this simulation, the position and charge of each particle can be modified in real time, and the field configuration will update itself accordingly.

All three field visualization techniques can be applied to show the overall electric field of the two-charge configuration: vector field, field lines, and "grass seeds".

(Please be patient - the simulation may take ~20 seconds to load)



Parameters

Q1 Charge: 2.5 (range: -5 to 5)

Q2 Charge: -2.5 (range: -5 to 5)

Field Visualization

- Show Vector Field Grid
- Field Lines

Grass Seeds

Electric Potential

Virtual Game-Like Laboratory

The screenshot displays a web browser window with the URL https://www.edx.org/courses/MITx/6.002x/2012_Fall/courseware/Overview/Circuit_Sandbox/. The page title is "MITx: 6.002x Circuits and Electronics". The navigation menu includes "Courseware", "Course Info", "Textbook", "Discussion", "Wiki", "Progress", and "Instructor".

The main content area is titled "CIRCUIT SANDBOX" and contains the following text: "Here's a sandbox where you can experiment with all the components we'll discuss in 6.002x. If you click on CHECK below, your diagram will be saved on the website and you can return at some later time." Below this text is a large grid-based workspace for building a circuit diagram, with a toolbar on the right side containing various electronic components like resistors, capacitors, and voltage sources.

The left sidebar contains a navigation menu with the following items: "Overview", "Welcome to 6.002x Lecture Sequence", "edX Tutorial Lecture Sequence", "Using the Tools Lab", "Circuit Sandbox Lab" (highlighted), "Week 1", "Week 2", "Week 3", "Week 4", "Week 5", "Week 6", "Week 7", "Week 8", "Midterm Exam", "Week 9", and "Week 10".

Interactive Auto-graded Problems

▶ Overview

▶ Week 1

Why Solid-State Chemistry?
Learning Sequence

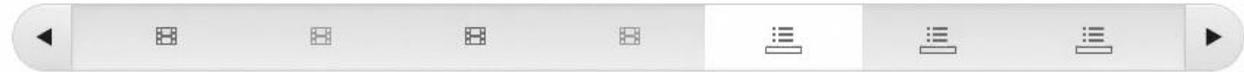
Modern Chemical Concepts and Periodicity of the Elements
Learning Sequence

The Electron and Light
Learning Sequence

Additional Study Material

Problem Set 1
Homework due October 28 

▶ Week 2



S1E1: NEWTON'S LAW

The next three segments cover review material that 3.091x will rely on over the course of the semester. Check your understanding with each exercises, and see the screencast at the bottom of the page if more information is necessary.

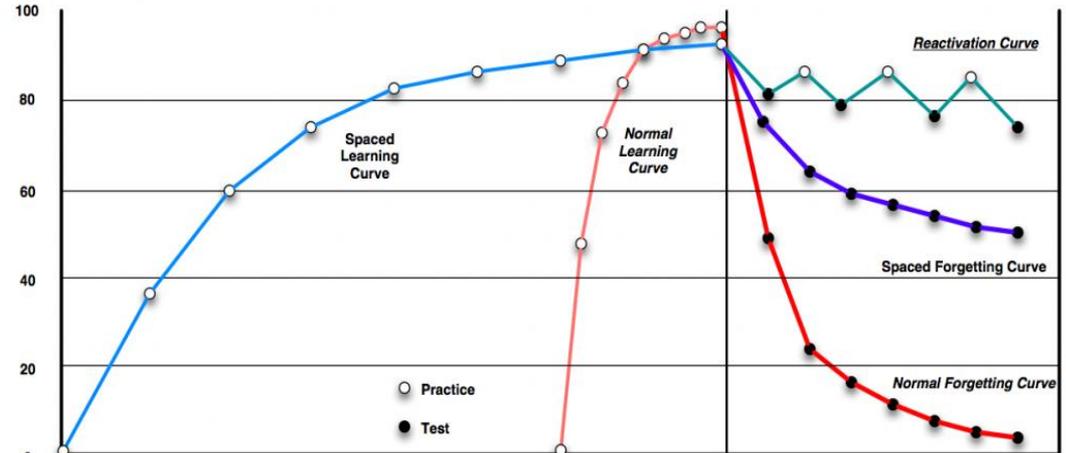
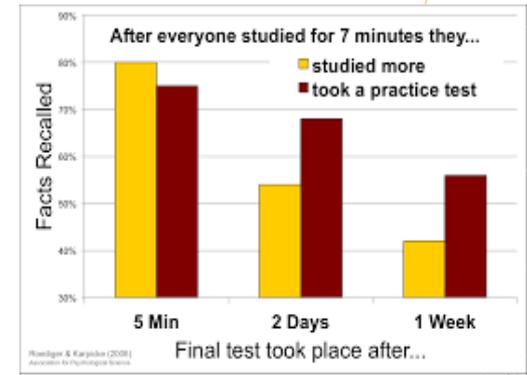
A ball of mass 2.5 kg is pushed along a frictionless surface with a constant force of 15 N applied. Calculate the acceleration of the ball. Express your answers in m/s^2 .

Check **Save** Show Answer

May use randomization, tolerances can be specified

The Science of Learning

1. Mind-wandering
2. Retrieval practice
3. Spaced practice
4. Hands-on
5. In-person tutoring



Adapted from Thalheimer, W. (2006). *Spacing Learning Events Over Time: What the Research Says*. Work-Learning Research, Inc.

Judicious Blending

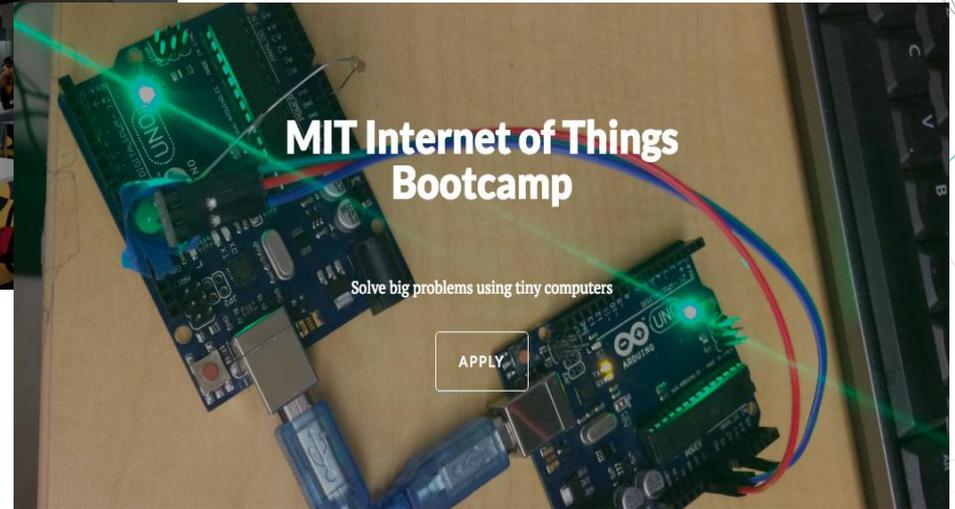
- Do online where online is better
 - Training versus education: video
 - Retrieval, spaced, interleaved training
 - Practice, simulations, games, practice, mastery
- Do onsite where what are better onsite
 - Feedback
 - Hands-on
 - Peer-to-peer and discussion

MicroMasters Credential

- ⑩ New mezzanine credential for working professionals
- ⑩ Fully online, credential issued by edX/MITx
- ⑩ If admitted to MIT, credit for a semester of Masters
- ⑩ Other universities signing up for follow-up master's
- ⑩ Recognized by industry leaders (Walmart, GE, IBM, Volvo, Fidelity, Ford, Bloomberg, Equifax, etc.)



Bootcamps



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News: New pathways for learning/credentials



A new landscape is emerging



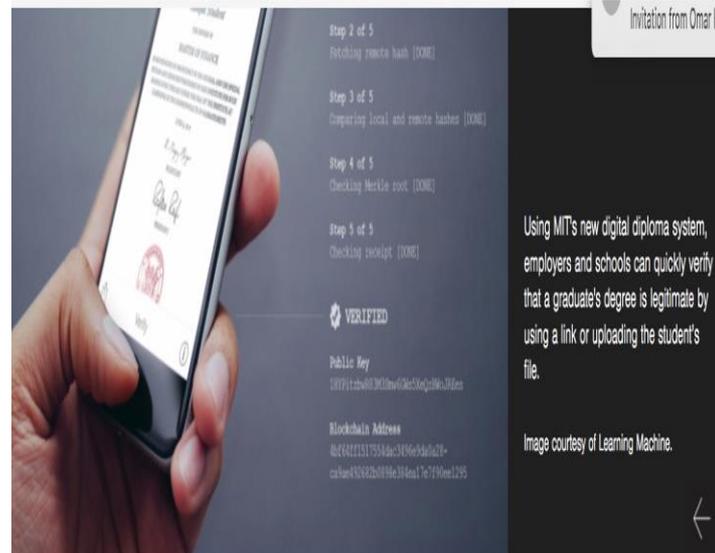
MIT News Browse or Search

Hacking virtual reality

Contributing to a culture of pioneers, MIT students explore the technical, philosophical, and artful dimensions of VR.

[Watch Video](#)

In MIT's hands-on humanities class CMS.339 (Virtual Reality and Immersive Media Production), students are grappling with multiple dimensions of making virtual reality, from technical challenges, to philosophical questions, to the art of storytelling.



Invitation from Omar Ha

Step 2 of 5
Fetching remote hash [DONE]

Step 3 of 5
Comparing local and remote hashes [DONE]

Step 4 of 5
Checking Merkle root [DONE]

Step 5 of 5
Checking receipt [DONE]

VERIFIED

Public Key
[01f112b0833020a606c2e0c9e0b630f85]

Blockchain Address
[026411117558dc3f96e6da28-cash4382b309a304aa1767f9ee1295]

Using MIT's new digital diploma system, employers and schools can quickly verify that a graduate's degree is legitimate by using a link or uploading the student's file.

Image courtesy of Learning Machine.

Digital Diploma debuts at MIT

AI powered
Knowledge-on-
Demand



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MIT
APP INVENTOR



MicroMasters™



Digital Diploma debuts at MIT

Using Bitcoin's blockchain technology, the Institute  has become one of the first

- Students can share their diplomas almost immediately with whomever they please, free of charge, without involving an intermediary.
- Important for students who need to prove to an employer or another university that they have an MIT diploma.
- Third party can easily verify that the diploma is legitimate without having to contact the Registrar's Office.

GYAN: AI Powered Knowledge-on-Demand



Knowledge on Demand

Provide Knowledge-on-Demand on any topic and keep it updated real time



Intuitive

Intuitive visualization and non-linear learning model using Semantic Networks in addition to conventional linear text book style material



Pedagogical Overlay

Pedagogical overlay reflecting 'experts' view of how to learn specific topics. Experts can easily compile a Gyan collection and overlay their expertise



Knowledge Marketplace

Marketplace facilitates rapid and relevant publication and consumption of knowledge



Self-Learning

Self-learning, adaptive engine that can tailor additional content by observing user performance



Integrated Assessment Framework

Comprehensive assessment framework for authors and administrators to assess content

Jameel World Education Lab (J-WEL)



Sparking a global renaissance in education for all learners

Reinvent Pre K-12

Renew Higher Education

Revitalize Workforce Learning

Applies systemic view to early education.

**STE(A)M Education ;
Early Childhood Education
Compassion and Social Emotional Supports
Computational Thinking
Teacher Professional Development & Leadership
Literacy**

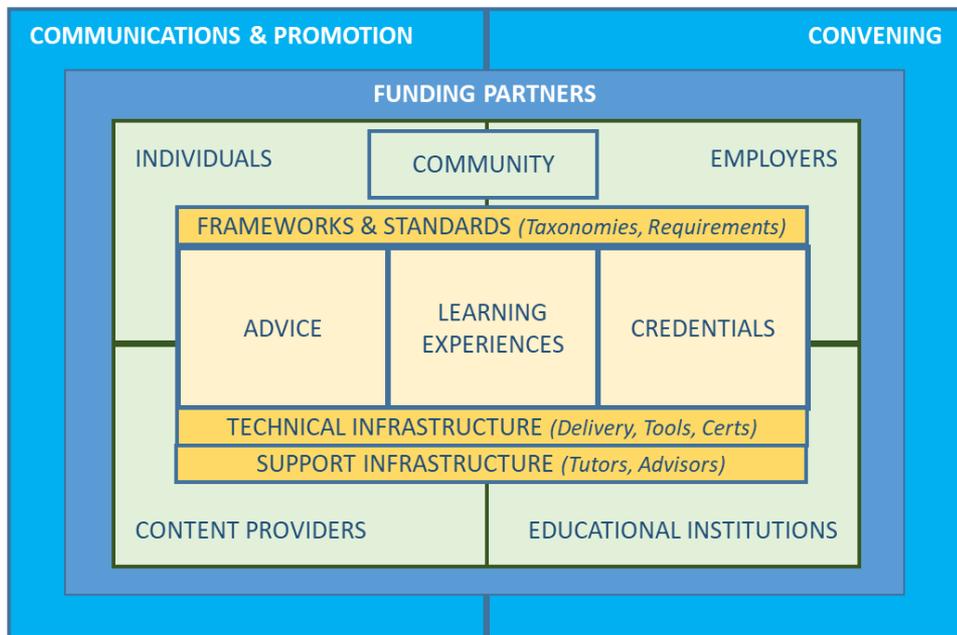
Aims to transform institutions.

**Student achievement
High impact research
Healthy ecosystem
Strong governance**

Help adults to take charge of their career development

**Workforce 2025
Design of the workplace learning organization
Ed tech and platforms
Specific content**

The Billion Workers Initiative



Our Dream:

**Provide the right skills
to the right people
in the right way
... at scale**

Transforming:

Advice
Learning
Credentials
Industry/school linkages

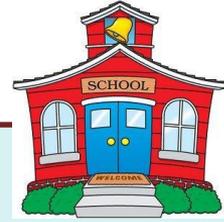
Our Goal: Provide the right skills to the right people in the right way – at scale.

- **Sensing demand** for skills and jobs
- **Assessing** worker skills
- **Advising** on good training and career paths
- **Developing and curating courses:** online, hybrid, experiential
- **Personalized** learning experiences
- Improving **job matching**
- **Collaborating** with schools, companies, and community institutions
- **Building local capacity** to execute and constantly improve the new processes
- Fostering a **provider ecosystem**
- Ongoing **innovation and research** to improve courses, experiences, outcomes



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Learning Experience

Online
Onsite
Hybrid
Simulation
Game
AR/VR

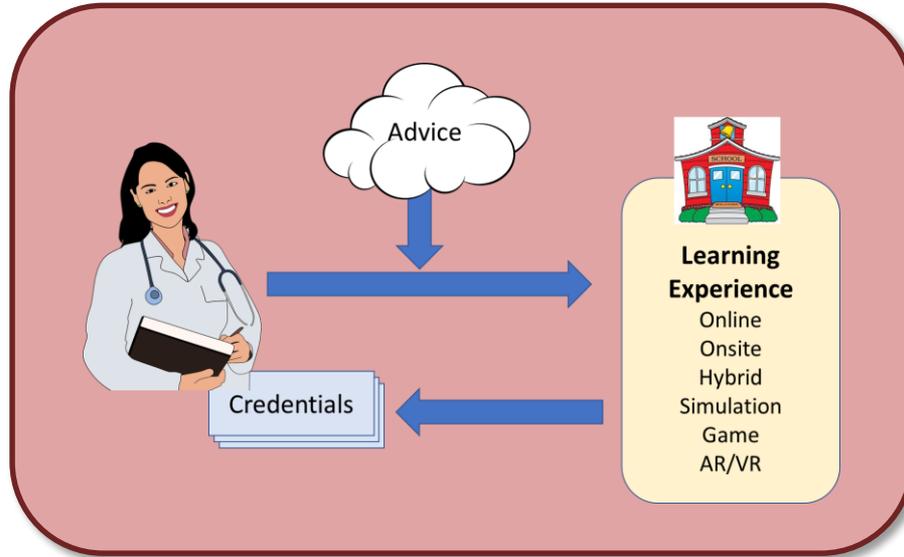


Research and
Policymaking

Agency Policy

Real-time Demand Status

Competencies
Roles
Policy
Adherence



Infrastructure

Staffing

Course
Design

Learning
Science
Research

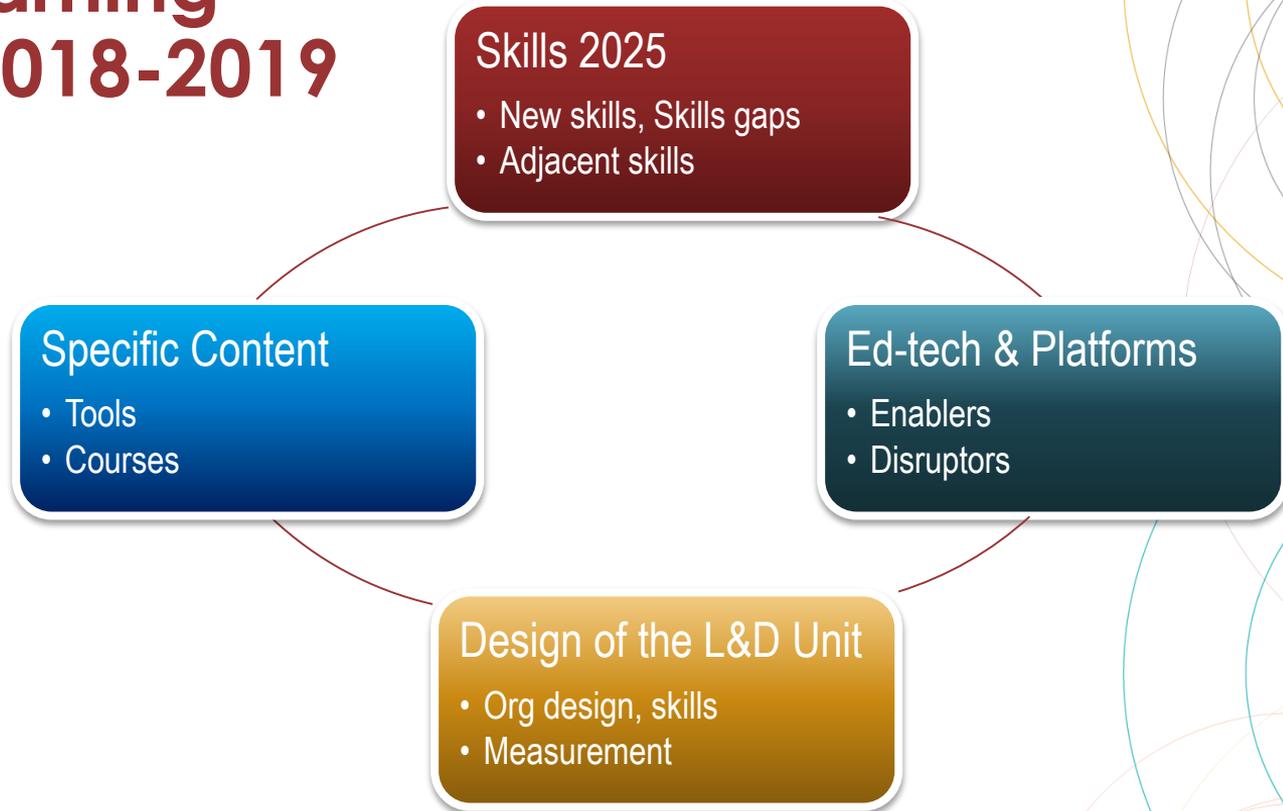
Assessments

Local
Customizations

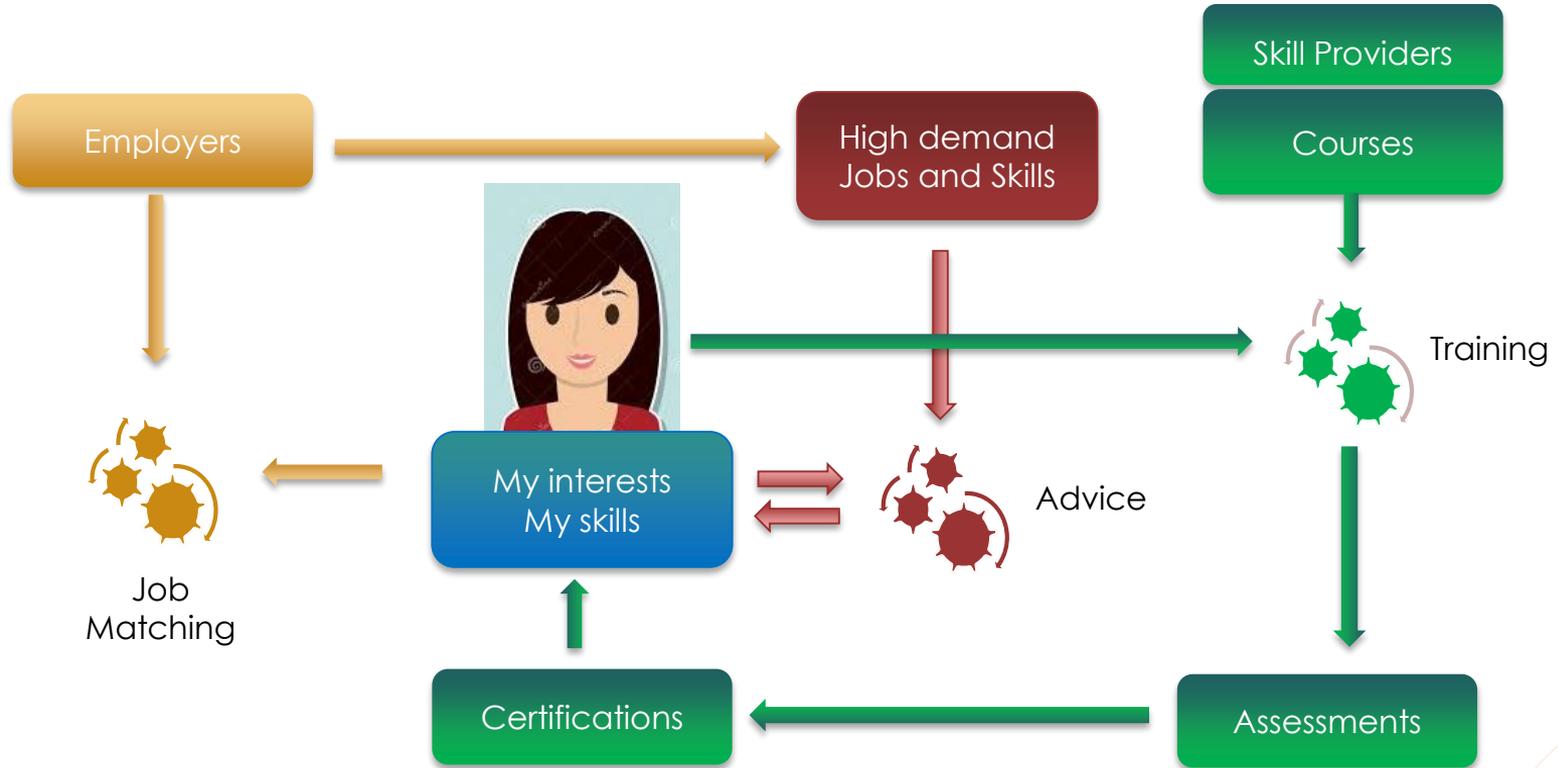
Credentialing requirements

Workforce Learning Focal Areas 2018-2019

**Working
Collaboratively
with Industry and
Society**

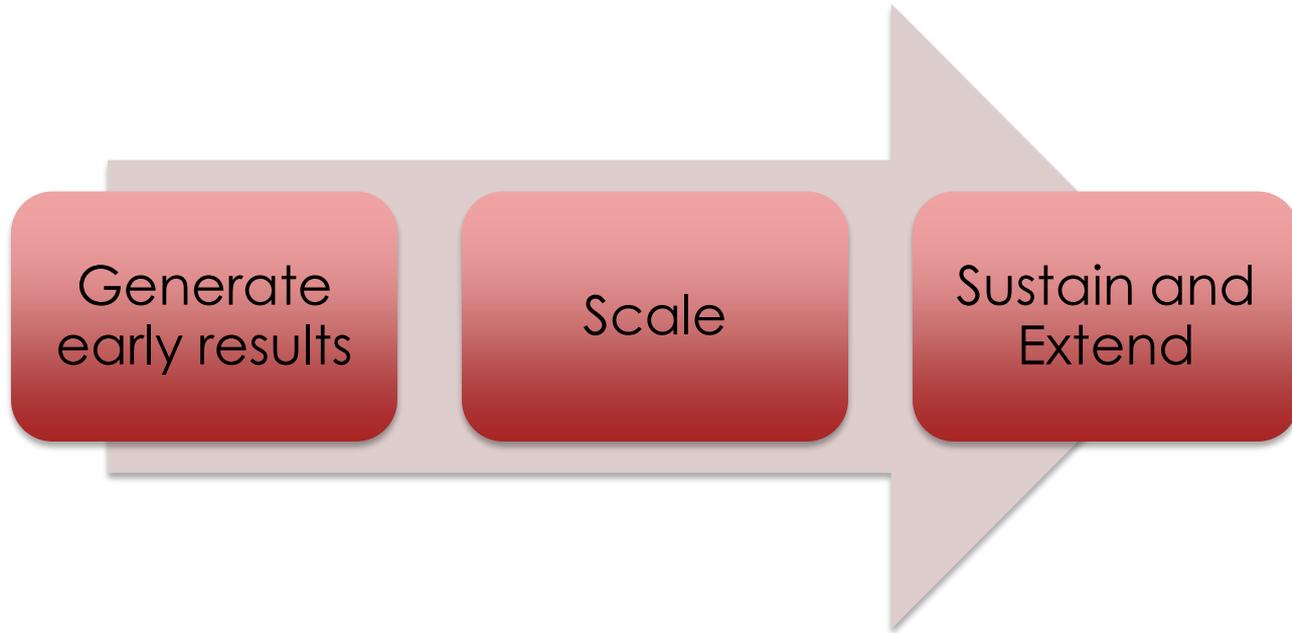


Initial Vision



APPROACH

Transforming workforce learning

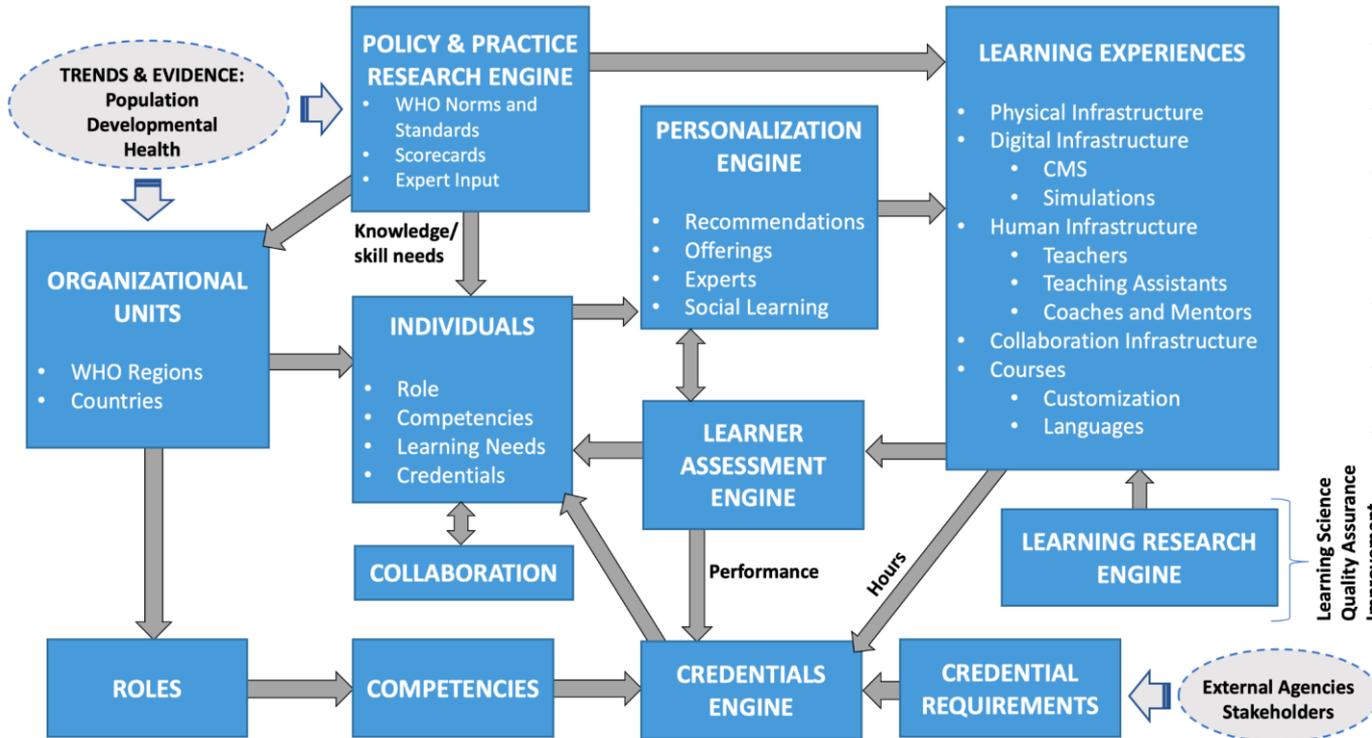


Generate
early results

Scale

Sustain and
Extend

The architecture supports many essential functions



- ✓ Personalization
- ✓ Education
- ✓ Certification
- ✓ Collaboration
- ✓ Optimization
- ✓ Innovation
- ✓ Policy support

Micromasters

Page 29



- Online learners that obtain the MITx MicroMasters credential in supply chain management now have a faster path to a master's degree at MIT and also at Curtin University and the University of Queensland.

Twenty three universities adopt MicroMasters and launch 46 new programs via edX

Recognized by industry leaders (Walmart, GE, IBM, Volvo, Fidelity, Ford, Bloomberg, Equifax, etc.)

Disruptive Innovation for Quality @ Scale

Supply

Digital Learning
Innovation across supply
chain of education

- Lectures, Labs Credentials
- Learning Science
 - Cognitive Tutors for Adaptive Learning
- Alternate Pathways
- Data used to improve learning
- The Open Movement
- A new ecosystem for learning

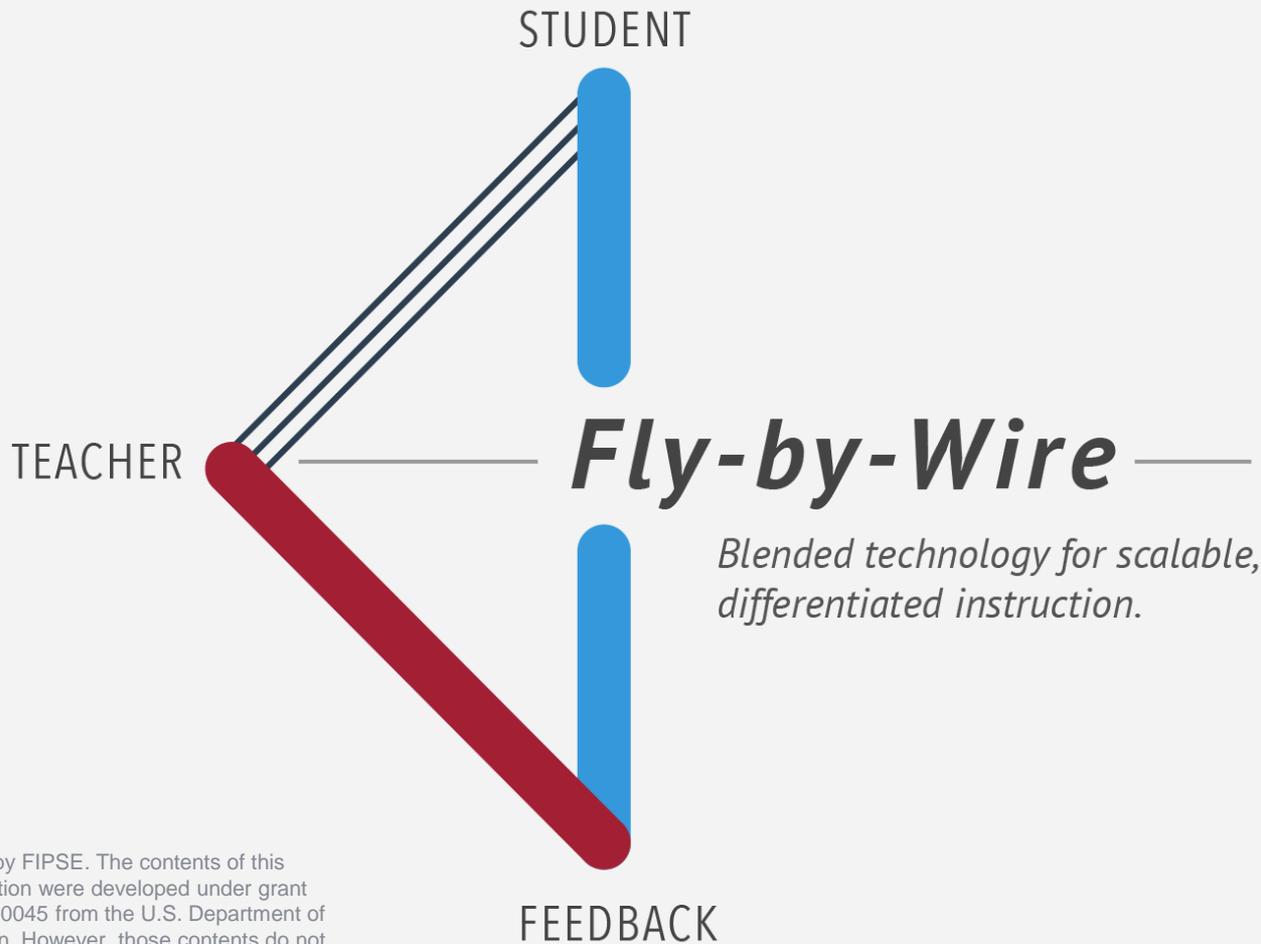
Changing the World of Learning



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Changing the World through Learning



Funded by FIPSE. The contents of this presentation were developed under grant P116F150045 from the U.S. Department of Education. However, those contents do not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the Federal Government

Fly-by-Wire

Scalable differentiated instruction through technology-enabled, competency-based, dynamic scaffolding

- Relate curricular content to student skills and outcomes
 - Modularity and curriculum mapping to create competency-based mappings
- **Enable teachers to differentially guide students towards competencies**
 - "Fly-by-Wire" technology, inspired by aeronautics and control theory,
- Deploy these approaches at Scale to meet the needs of many learners cost-effectively.
 - Interoperable online technology architecture



MIT News

Browse or Search

Search

From

(MM/DD/YYYY)

To

(MM/DD/YYYY)

SEARCH



MIT launches MITx MicroMasters in Principles of Manufacturing

New program offers alternative learning pathway to mastering fundamental skills needed for global manufacturing excellence and competitiveness.

January 9, 2018



Worldwide change takes global effort

The American University in Cairo is the first school to grant master's credits to MITx Data, Economics, and Development Policy MicroMasters program learners.

January 5, 2018



GE offers to interview Mass. residents who complete MITx MicroMasters in supply chain management

Gov. Charlie Baker and industry leaders are promoting the MicroMasters program and digital learning to expand access to education.

December 11, 2017



A truly global supply chain of knowledge

After only online collaborations, four MicroMasters students meet in person for the first time — and go on to win a worldwide competition.