

Apprenticeship Inclusion Models (AIM)
for Youth and Adults with Disabilities

Replacing Assessment Tests with E-Portfolios: IMTFolio Pilot Example

December 2020



Tool Contents

- **Background:** Barrier & Potential Solution
- **Identified Solution:** E-portfolios & UDL guidelines
- **Piloted Solution:** IMTFolio & Lessons Learned
- **Broad Applicability:** Current, Ongoing, Potential
- **How to Access:** IMTFolio, CAST E-portfolio, UDL
- **Appendix:** Resources & IMTFolio Select Competencies

Background

Barrier Identification

- Apprenticeship programs train a diverse group of apprentices including those with learning disabilities.
- Typically, entry into an apprenticeship involves a traditional assessment test which tests the individual at a single point in time.

Barrier Identification 2

- The Industrial Manufacturing Technician (IMT) registered apprenticeship found that a single “one size fits all” approach such as taking an exam was presenting a barrier of entry into production positions.



Universal Design for Learning (UDL)

- UDL is an evidence-based framework for designing inclusive learning environments, instructional practices, and flexible educational tools and materials that give all individuals equal access and support for learning opportunities .

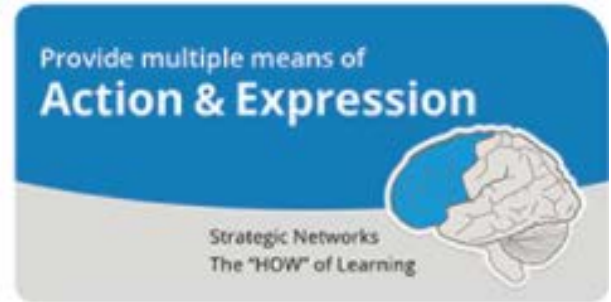
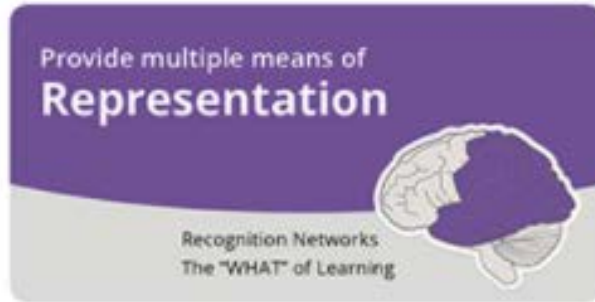


**UDL supports
all learners to become
resourceful and
knowledgeable.**

Universal Design for Learning 2

- UDL is predicated on three core principles:
 - 1) Multiple ways to engage students in learning;
 - 2) Multiple ways to present content; and
 - 3) Multiple ways for students to demonstrate what they are learning (Meyer et al, 2014; Meyer & Rose, 1998; Rose et al, 2005; Rose & Mayer, 2002).
- Approaches like UDL are needed to make apprenticeships inclusive of all types of learners.

UDL Guidelines: 3 Principles



CAST (2018). Universal Design for Learning Guidelines version 2.2.
Retrieved from <http://udlguidelines.cast.org>

Potential Solution: E-Portfolios

- E-portfolios are an important innovation that offer a different way to document skills and knowledge that an individual can take with them to demonstrate upskilling along a career pathway and readiness for further training or promotion in the work setting.
- The e-portfolio platform allows trainers to create assignments (called “challenges”) for learners to prompt them to provide evidence of their knowledge and skills gained through training.

Potential Solution: E-Portfolios 2

- Each challenge can be tagged by the author with 5 to 7 relevant competencies that tie the evidence gathered to relevant knowledge or skills.
- A resource section in IMTFolio will house an inventory of videos that can be embedded directly when creating a challenge.



Potential Solution: E-Portfolios 3

- Learners can choose challenges to document evidence of a skill or knowledge in different ways (typing, upload of video, audio, diagrams).
- Each challenge has 3 steps: review to understand what is being asked; post evidence and provide short summary; and select up to 3 relevant competencies.
- As learners complete more challenges, they create a robust e-portfolio that can be shared as hyperlinks or PDFs.

CAST E-Portfolio UDL Supports

- ✓ Simple directions for both creating & completing a challenge
- ✓ Employers/trainers can use video, audio, diagrams, and/or text when creating a challenge
- ✓ Trainers can provide feedback on any completed challenge or assign a challenge multiple times
- ✓ Trainers can group specific job seekers into cohorts
- ✓ Trainers can view job seeker's progress across challenges and provide feedback within the tool

CAST E-Portfolio UDL Supports 2

- ✓ Learners can submit challenge responses via photo, video, and/or text
- ✓ Competencies with definitions can be tagged to the challenge response
- ✓ Text help toolbar – built in read aloud, translation, and dictionary functions
- ✓ Speech to text – voice inputs for all text fields



**UDL supports
all learners
to become strategic
and goal-directed.**

CAST E-Portfolio UDL Supports 3

- ✓ Closed captioning – all videos include subtitles in English with auto-translation available
- ✓ Digitally collected event usage log provides a click-by-click record of usage of the e-portfolio allowing for iterative improvements
- ✓ Modern responsive web design practices ensure that the digital tool is portable across environments and devices, including tablets and smartphones

Piloted Solution: IMTFolio



Building a
Future
That Works



 **CAST** | **Until learning has no limits®**

JFF, WRTP, and CAST worked in partnership to co-design and pilot IMTFolio.

CAST E-Portfolio + IMT RA Job Book

- IMT leveraged the e-portfolio software platform and their IMT Registered Apprenticeship Job Book (which is aligned with the MSSC – Manufacturing Skills Standards Council)
- The job booked was translated onto the e-portfolio platform and IMT trainers were engaged in co-developing the roll-out and coaching plan to support implementation.



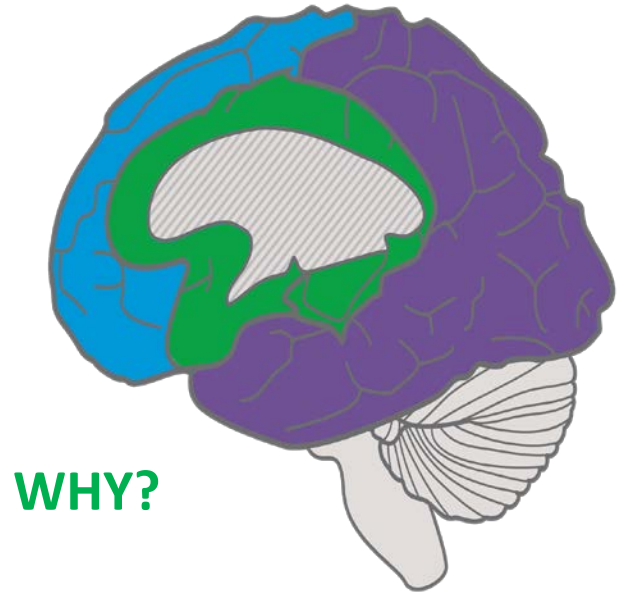
Accessibility-First Tool Design

IMTFolio was designed using the principles of UDL, a framework for designing learning environments that are accessible and effective for all.

It works by providing options in the areas of:

- **Engagement**
- **Representation**
- **Action & Expression**

WHAT?



HOW?

WHY?

Creating a Challenge

Step 1: Select a category for your challenge

Each challenge targets a domain aligned with the IMT RA

- Safety
- Quality Practices & Measurement
- Manufacturing Processes & Production
- Maintenance Awareness
- Essential Industry Skills




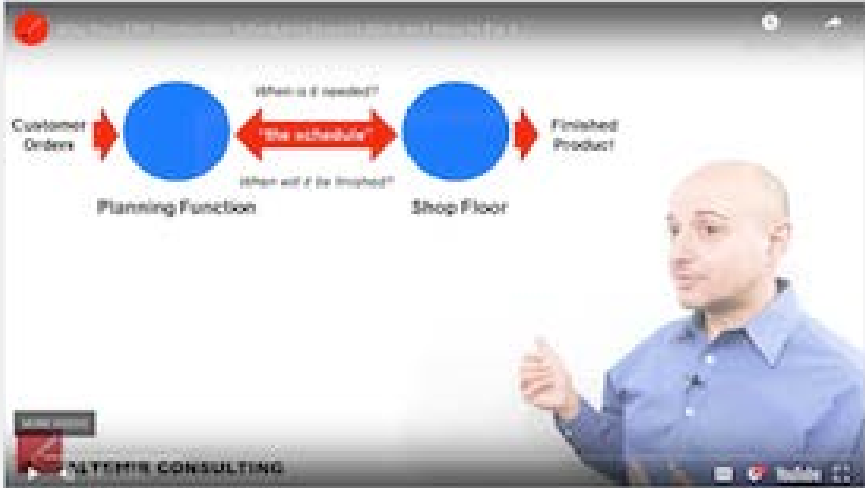
Creating a Challenge 2

Step 2: Provide instruction using multimedia

Upload photos and images or embed videos to support instruction and reduce obstacles for learners

Embed a video:

 YouTube

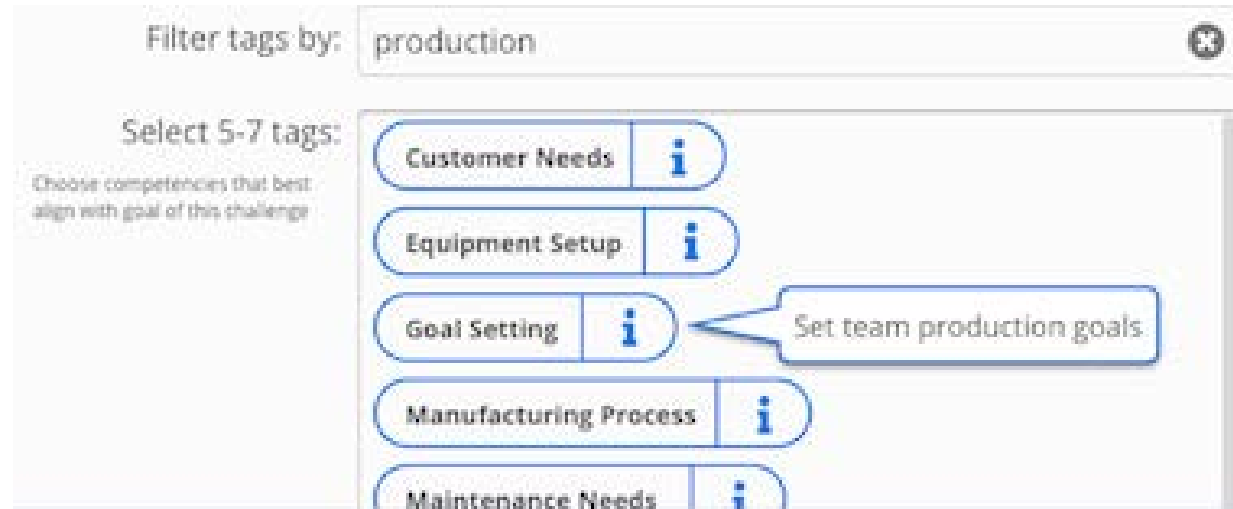


Remove video

Creating a Challenge 3

Step 3: Align with relevant competencies

Precise, industry-specific competencies derived from the IMT Training Guidelines help trainers create goal-oriented challenges



The screenshot shows a user interface for selecting competencies. At the top, a search bar labeled "Filter tags by:" contains the word "production". Below this, a section titled "Select 5-7 tags:" includes the instruction "Choose competencies that best align with goal of this challenge". A list of five competency tags is displayed, each in a rounded rectangle with an information icon (i) on the right:

- Customer Needs
- Equipment Setup
- Goal Setting
- Manufacturing Process
- Maintenance Needs

A callout box points to the "Goal Setting" tag with the text "Set team production goals.".

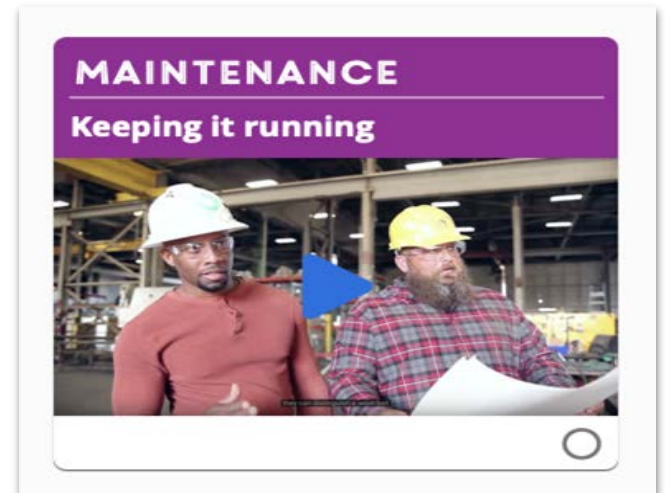
Challenges Support Learners

Promote revision and continuous improvement

- Learners can edit their work or respond to a challenge again, producing a record of growth and progress over time

Work in any context

- Capture skill-building on the job site, in the classroom, or through related instruction



Challenges Support Learners 2

Utilize multimedia options

- Learners can use video, photo, and audio to receive instruction and demonstrate their knowledge and skills with fewer barriers

Develops focused and precise decision-making

- Learners select, synthesize, and share their best work



AIM Learnings

- Benefits – IMTFolio Pilot usage log data
 - 100% of active users made use of accessibility toolbar; 100% tried text-to-speech at least once and some very frequently; one user used function 45 times
 - 25% accessed Spanish translation
 - 100% of challenges included multimedia
- Use of multimedia is a better way to transfer manufacturing knowledge. For example, you can upload a video of you operating a forklift.

AIM Learnings 2

- Need co-design, coaching, training, and rollout support to be successful— the e-portfolio tool alone is not enough
- COVID brought market uncertainty and needing to incorporate distance learning in the middle of cohorts, but IMTFolio proved valuable to incorporate students from anywhere virtually
- Broad applicability and versatility of e-portfolio software – ability to be customized for different settings and programs

Broad Applicability

Broad Applicability Notes

The CAST e-portfolio software has been customized to different settings as referenced in subsequent slides.

All the current and ongoing customizations have been focused on workforce development, but the software could be applied to other sectors as well.

Global Accessibility Utilities

Texthelp toolbar - built in read aloud, translation, and dictionary functions



Show or describe a time when you conducted an experiment to test out a hypothesis. What did you discover?



Speech-to-text - voice inputs for all text fields are available on mobile and desktop



Closed captioning - all videos include subtitles in English with auto-translation available for additional languages

Current and Ongoing

STEMFolio

CAST partnered with YouthBuild USA to help out-of-school young people demonstrate authentic STEM (science, technology, engineering, math) skills and build a portfolio to make them eligible for STEM careers

<https://www.stemfolio.org/login>



STEMFOLIO

Your space to collect, demonstrate, and share your experiences and learning at YouthBuild.

CAST STEM Voices: Firefighter

STEMFOLIO is Science, Technology, Engineering, Math and Career Exploration in one tool.

IMTFolio

JFF, CAST, and WRTP partnered to customize and pilot in IMT Pre-apprenticeship to assess readiness to enter the IMT Registered Apprenticeship as well as mastery of IMT competencies

<https://www.imtfolio.org/login>



The screenshot shows the IMTFolio website interface. At the top, the logo "IMTFOLIO" is displayed in white on a green background. Below the logo, the tagline reads: "Your space to collect, demonstrate, and share your experiences and learning at WRTP." The main content area features a video player with a play button. The video is titled "IMT Apprenticeship" and shows a man, Phil Neuenfeldt, speaking. Below the video, his name and title are displayed: "Phil Neuenfeldt, Wisconsin State AFL-CIO President". At the bottom of the page, a green banner contains the text: "IMTFOLIO is Industrial Manufacturing Technician (IMT) career exploration."

CTEFolio

CAST is partnering with the Brockton and Somerville (MA) school districts to develop CTEFolio to allow Career and Technical Education educators to create flexible assignments and students to show what they know in multiple ways.

<https://brockton.ctefolio.org/login>

CTEFOLIO

Your space to collect, demonstrate, and share your experiences and learning at Brockton High School.



Potential

Learners Who are Deaf*

- **Barrier:** Hearing loss impacts the capacity for communication and thus creates barriers to communication and to learning.
- **Solution:** IMTFolio allows for use of various media to represent a task and demonstrate mastery. A trainer could use a video with captions to demonstrate and then a learner could video themselves and type a few sentences to demonstrate.

Learners Who are Deaf* 2

- **Program & Employment Retention:** a pre-apprentice or apprentice who is deaf can communicate skills and abilities using IMTFolio and thereby progress through program to completion. IMTFolio allows for a collection of materials (i.e., completed challenges), that can be made into a separate folio aligned with prospective work placement or as part of a registered apprenticeship. This folio can be shared out as a link or a PDF.

Learners Who are Deaf* 3

** The term deaf is used in an all-inclusive manner, to include people who may identify as deaf, deafblind, deaf disabled, hard of hearing, late-deafened, and hearing impaired. The author recognizes that for many individuals, identity is fluid and can change over time or with setting. The author has chosen to use one term, deaf, with the goal of recognizing experiences that are shared by individuals from diverse deaf communities while also honoring their differences.*

Learners with Dyslexia & Dysgraphia

- **Barrier:** Learners with Dyslexia face visual information processing challenges when reading text that can result in struggles with reading comprehension and vocabulary building. Learners with Dysgraphia have challenges with handwriting and legibility.
- **Solution:** IMTFolio provides options for how learners can acquire information and present their knowledge, reducing obstacles that visual processing challenges can produce.

Remote Learning Environments

- **Barrier:** While related instruction for career training in advanced manufacturing has traditionally happened in the classroom, COVID-19 pandemic sharply increased the need for online instruction and digital tools to support remote learning.
- **Solution:** IMTfolio is a cloud-based software that learners can reach from anywhere with an internet or cellular connection.

How to Access

Contact Information

- **IMTFolio:** If you are interested in the IMTFolio and/or the IMT Registered Apprenticeship
 - Contact Patricia Maguire at pmaguire@jff.org
- **CAST E-Portfolio:** If you are interested in customizing the CAST E-Portfolio to your program
 - Contact Sam Johnston at sjohnston@cast.org
- **UDL Guidelines:** If you want to assess for and/or integrate UDL guidelines and supports
 - Refer to udlguidelines.cast.org & AIM UDL Brief

Customizing CAST E-Portfolio Costs

- Task 1: Tool Co-Design & Development: 164 Hours
 - Task 2: Professional Development & Training: 80 Hours
 - Task 3: User Support & Maintenance: 16 Hours
 - Task 4: Data Analysis: 16 Hours
-
- 276 hours of CAST Labor = \$39,500
 - Server and QA Costs Estimate: \$1,500
 - **Total Cost Estimate: \$41,000**

Cost Estimate Notes

- This cost estimate represents the core tasks and process followed to co-design and pilot IMTFolio.
- Cost will depend on size of program and length of time.
- In addition, programs may decide to invest in additional features and/or software redesign.

Questions Checklist/Assessment

- How do you currently provide instruction?
 - o How do learners build necessary skills?
- When/how do you provide feedback to learners?



Questions Checklist/Assessment 2

- How do learners reflect on their learning?
 - o How do they recognize their own progress?
 - o How do they identify gaps in their skills that they still need to address?
- How are you currently making accommodations for individuals with learning differences?
 - o Give examples of how you are already adapting instruction.

Appendix

Resources

- **JFF:** <https://www.jff.org/what-we-do/impact-stories/center-for-apprenticeship-and-work-based-learning/>
- **CAST:** <https://www.cast.org/>
- **WRTP:** <https://wrtp.org/about/>
- **Industrial Manufacturing Technician (IMT) Registered Apprenticeship Program:** <https://www.jff.org/what-we-do/impact-stories/center-for-apprenticeship-and-work-based-learning/our-work/industrial-manufacturing-technician-imt-registered-apprenticeship-program/>

Resources 2

- **IMTFolio:** <https://www.cast.org/our-work/projects/imtfolio-advanced-manufacturing-career-pathways-disabilities>
- **AIM Universal Design for Learning (UDL) Brief:** <https://www.spra.com/aim/>
- **National Center on Learning Disabilities:** <https://ncld.org/>

IMTFolio: Five Domains

- 1) Safety
- 2) Quality Practices & Measurement
- 3) Manufacturing Processes & Production
- 4) Maintenance Awareness
- 5) Essential Industry Skills

IMTFolio: Select Competencies

Tags	Competencies
Blueprints	I can identify the fundamentals of blueprint reading
Business knowledge	I can determine the impact of production time on the business its customers and supply chain
Collaboration	I can coordinate workflow with team members and other work groups
Compliance	I can document product and process compliance with customer requirements
Critical Thinking	I can show my own clear thinking that is rational, open minded, and informed by evidence

IMTFolio: Select Competencies 2

Tags	Competencies
Decision Making	I can choose a direction or next steps based on data, evidence, past experience, and input from others
Local impact	I understand and communicate the impact of production time, material supply, quality and quantity on the business goals of my employer, its supply chain, and its customers
Maintaining quality	I take corrective actions to restore or maintain quality

IMTFolio: Select Competencies 3

Tags	Competencies
Preventative maintenance	I have an awareness of preventative maintenance and routine repair needs
Quality inspections	I can inspect materials and product/process at all stages to ensure they meet specifications
Safety drills	I can perform emergency drills and participate in emergency teams
Safety requirements	I fulfill safety and health requirements for maintenance, installation, and repair

For More Information

- For more information or questions about the IMT Registered Apprenticeship and/or IMTFolio, please contact JFF at pmaguire@jff.org.
- For more information or questions about CAST's E-folio software platform and/or to discuss customizing for your program, please contact CAST at sjohnston@cast.org.