

COE TTHP Third Annual Technical Meeting

**Creating an Adaptive and
Distributed Competency-Based
Learning Environment to Develop
the Next Generation of Aviation
Safety Inspectors**

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**Center of Excellence for
Technical Training &
Human Performance**

Project Overview

- Convert Aviation Safety Inspector String Training Courses from Objective-based to Competency-based Education
- Regionalize competencies

Research Design

- Equivalent Methodology with Medicine

Frank, J. R., Mungroo, R., Ahmad, Y., Wang, M., De Rossi, S., & Horsley, T. (2010). Toward a definition of competency-based education in medicine: A systematic review of published definitions. *Medical Teacher*, 32 (8), 631-637. DOI: 10.3109/0142159X.2010.500898

- Working Definition

Competency-base education (CBE) is an approach to preparing [Aviation Safety Inspectors] for duties that are fundamentally oriented to FAA-determined outcome abilities and organized around competencies derived from an analysis of governmental and regional needs. It de-emphasizes time-based training and promises greater accountability, flexibility, and learner-centeredness (from the definition in Frank et al., 2010)

- Create competencies and sub-competencies
- Create a database

Preliminary Findings

- Competency-based education has grown in popularity since 1999 (Frank et al., 2010)
- Competencies help the FAA track what Aviation Safety Inspectors are equipped to perform
- Competencies and Sub-Competencies allow for Adaptive and Distributed Learning Environments
- Database manipulation of competencies allow for ad hoc course development in real time (no more delays to build courses)

Preliminary Recommendations

- Create an interactive database, Application-driven to allow ad hoc competency development in ASIs
- Create an FAA Training App
 - Multiple layer, secure access to ad hoc training
 - Uses Artificial Intelligence protocols to anticipate learning needs
 - Provides real time awareness of training for managers
 - Fueled by a secure database

Anticipated Project End State

- Part 1 (Conversion of courses) anticipated completion in June 2019
- Part 2 (Regionalize competencies) requires an NCE out to December 2019
- Suggest contract to help create the training app

Value and Impact to the FAA

- Competency-base education, tethered to a functional database makes training in residence unnecessary
 - The FAA can no longer afford to support ASI string training
 - Most of the money goes toward airfare and lodging costs
 - Current outcomes of training are unreliable
- Fusion of Artificial Intelligence and exploitable database changes how the FAA trains
 - It's adaptive and distributed
 - Could be managed through a mobile learning management system
 - Current LMS is not sufficient

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Analysis of a Tech Training Course for
Specific Part-Task Training
Implementation and Enhancement Based
on the Addition of New Technology

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Project Overview

- Work commenced January 2017 (Tech Monitor: Dr. Hezekiah Braxton)
- Review of the literature
- Focused on Augmented Reality as the “New Technology”
- Used FAA Course 43062001, FDIO-G Hardware Maintenance as the test bed for the project
- Created opportunities for AR interface to alter how work is accomplished
- Provided a written report of work accomplished in October 2018 and March 2019
- Close out briefing anticipated by June 2019

Research Design

- Review of the Literature
 - Examined best practices (industry and in higher learning)
 - Examined capabilities of Augmented Reality
- Methodology
 - Select one Tech Ops course
 - Analyze the learning framework of the course
 - Examine ways to introduce AR in task completion
 - Examine changes in workforce (Master Tech-Tech)

Preliminary Findings

- Master Tech
 - Fully understands how to perform maintenance on specific pieces of equipment
 - Available remotely, rather than on site
- Tech
 - Prepares for maintenance activity
 - By watching video
 - By reviewing publications (created expressly for the task)
 - Makes contact with Master Tech
 - Uses AR device to maintain contact with Master Tech

Preliminary Recommendations

- Examine workforce development documents
- Streamline training (less in residence, more by remote device)
- Create interface protocols for Master Tech and Tech for task completion
- Create videos to support just-in-time training
- Develop a database of competencies

Anticipated Project End State

- The project has been concluded

Value and Impact to the FAA

- Adjustments in how training is conducted will save money
- Adjustments on how knowledge/skills/abilities are obtained will save money in Tech Ops training
- Augmented Reality will provide an extra layer of oversight and quality assurance