COE TTHP
Center of Excellence for
Technical Training &
Human Performance

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OKLAHOMA STATE UNIVERSITY

COURSE DEVELOPMENT (PROJECT: CMD 004/005)

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Project Description: For modernization of Air Traffic training, this project will demonstrate development of aviation technical courses using current agency practices assessing for efficiencies and innovative instructional systems design practices. This project would also address standardization of contractor course development efforts. Research industry best practices; identify current efficiencies and provide recommendations on innovation w/in instructional systems design (other tool set/technologies).
Scope: Air Traffic Controller and Technician Training

OBJECTIVES

➢ *Examine current course development protocols*
➢ *Examine current use of eLMS for course development*
➢ *Created a modified ISD protocol that used Design Research features that would be compatible for NextGen courses*
➢ *Develop a modified ISD protocol that uses Design Research features that can be used in the eLMS*
➢ *Create a process that all developers can use to develop courses using Design Research and ISD methods*

NEXTGEN CHALLENGES IN AEROSPACE EDUCATION

Course development requirements for NextGen training are evolving. Course objectives, presented by PowerPoint slide, do not engage the learner as well as other tools readily available through the mobile learning environment in a top-rated learning management system.

INITIAL SUCCESSES AND CHALLENGES

➢ *Existing courses for both ATC and Tech Ops have some form of Course Design Guide*
➢ *Course Design Guides are not equally effective across six courses analyzed*
➢ *Design Research features are not relevant to existing course development protocols and would not fit well in NextGen*
➢ *Initial analysis of the FAA Academy learning management system indicated that it would need to be improved to meet NextGen requirements*
➢ *In principle, existing ISD protocols are still valid*

BEST PRACTICES FROM HIGHER EDUCATION

REGIS UNIVERSITY
Recommendation: Develop a better relationship between the ISD/ISS and Instructional Technology, so that the instructor can either follow the Option 1 or Option 2 process.
Recommendation: Provide instructor development workshops, conducted by ISD/ISS and Instructional Technologists, where the focus is on better course development processes and procedures, and where the instructor is made aware of other ways to use technology in the classroom.

SOUTHERN OREGON UNIVERSITY
Recommendation: Ensure that the elements of a syllabus are also in the Course Design Guide.
Recommendation: Expand the types of interactions for students.
Recommendation: Incorporate more of the tools shown in Table 1 in each course.

UNIVERSITY OF TEXAS AT SAN ANTONIO
Recommendation: Consider creating an instructional process where re-design is an acceptable outcome to course development.
Recommendation: Think beyond standard course development processes and intentionally incorporate more technology that helps learners engage more with the material in less restrictive ways. Create an opportunity for unscripted, dynamic learning.

WESTERN MICHIGAN UNIVERSITY/UNIVERSITY OF VICTORIA
Recommendation: Consider revising or adding to list of instructional methods for ATC and Tech Ops training. Ask yourself the question: does the instructional method used match how the learner assimilates the new material or learning objective?

TEXAS A&M UNIVERSITY
Recommendation: Consider using lessons learned in the Dondlinger study for Tech Ops training. Although gaming and simulation would be an effective tool for air traffic controller training, much of their curriculum is based on more realistic simulation, perhaps for good cause. One would not want an air traffic controller to view his or her activity as "one, big game."
Recommendation: The FAA should ensure that ISSs develop skills in gaming and simulation design, not just what has always been done. These new skill sets would be useful in NextGen training.

LMS FUNCTIONALITY

Blackboard 9.1 is adequate for current needs at the FAA Academy, but upgrades are necessary for NextGen course development.
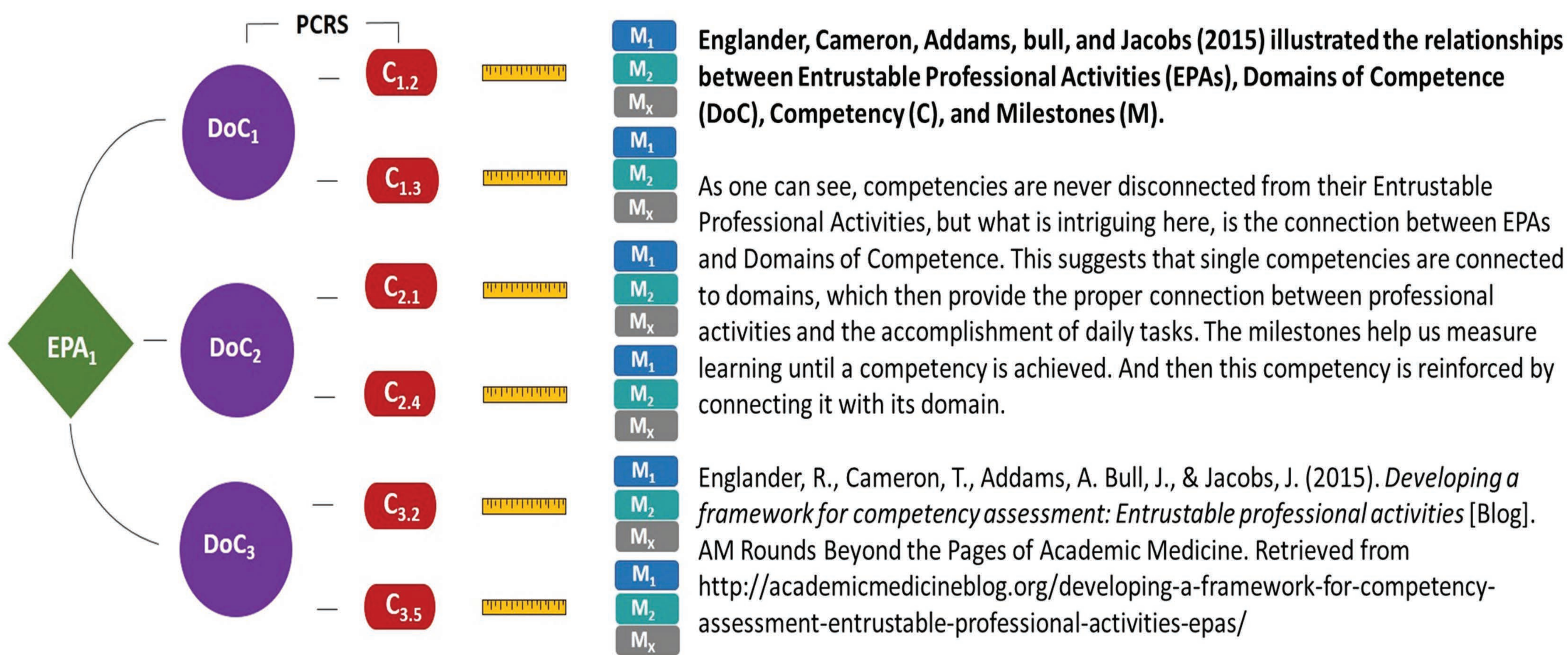
Based on a study of 20 learning management systems, there are at least six that have all that the FAA needs to create a mobile learning environment, with real-time tracking of training events. For an explanation on how Tin Can (xAPI) works for self-regulated learners, go to Vazquez, Rodriguez, and Nistal (2015).

Vazquez, M. M., Rodriguez, M. C., & Nistal, M. L. (2015). Development of a xAPI application profile for self-regulated learning. *Global Engineering Education Conference (EDUCON), 2015 IEEE,* 358-365. Tallinn, Estonia. doi: 10.1109/EDUCON.2015.7095997.

Bb Blackboard

COMPETENCY-BASED LEARNING/EDUCATION

Englander, Cameron, Addams, bull, and Jacobs (2015) illustrated the relationships between Entrustable Professional Activities (EPAs), Domains of Competence (DoC), Competency (C), and Milestones (M).

As one can see, competencies are never disconnected from their Entrustable Professional Activities, but what is intriguing here, is the connection between EPAs and Domains of Competence. This suggests that single competencies are connected to domains, which then provide the proper connection between professional activities and the accomplishment of daily tasks. The milestones help us measure learning until a competency is achieved. And then this competency is reinforced by connecting it with its domain.

Englander, R., Cameron, T., Addams, A. Bull, J., & Jacobs, J. (2015). *Developing a framework for competency assessment: Entrustable professional activities* [Blog]. AM Rounds Beyond the Pages of Academic Medicine. Retrieved from http://academicmedicineblog.org/developing-a-framework-for-competency-assessment-entrustable-professional-activities-epas/

PROJECT CLOSEOUT: FUTURE RECOMMENDATIONS

Recommendations for the future research:

➢ **Provide concrete examples of redesigning a course or chunks of a course from traditional lecture to a gamification environment.**

➢ **Using a case study approach, describe how an existing instructor-led course with traditional lecture design was redesigned to integrate game elements with learner engagement, immediate feedback, and use of bring your own device technology in a face-to-face environment.**