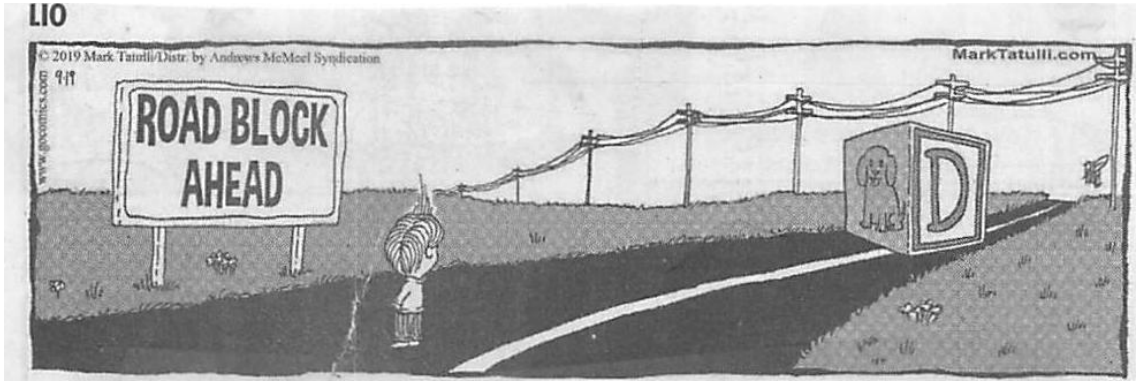
Shared Learning Materials for Advanced Manufacturing (SLAM) Workshop #3 Next Steps

Project Directors
Dr. Richard A. Wysk, NC State University
Dr. Gul Okudan-Kremer, Iowa State University
Technical Committee: All of you

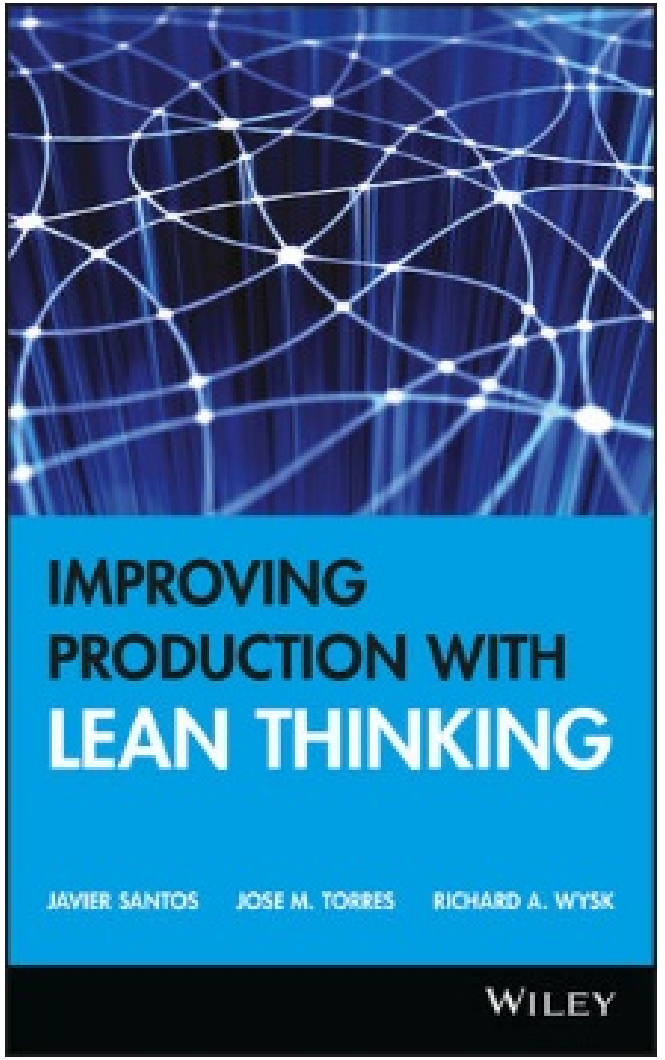
Purpose of the Workshops #1 and #2

- Cultivate a community of experts teaching in advanced manufacturing
- Understand the roadblocks associated with developing a Shared Repository of teaching materials
- Have we missed anything?



Our basic hypothesis

- We feel that an Advanced Manufacturing Learning Repository will serve as the seed for an “organic set of learning materials”, which will continue to grow over time.
- We feel that a focused technical community of college educators who share their technical experiences, course materials and teaching experiences so that a broad compilation of educational materials can be provided to participating schools that will catalyze advances in *Modern Manufacturing*.



Preparing an NSF proposal - options

- NSF IUSE Institutional and Community Transformation proposal. We seek to unite multiple universities utilizing a teaching repository (Level 2 award up to $3M) that will create a shared platform for creating and using traditional and new technological materials (typically 4- 5 years)
- NST Institutional and Community Transformation proposal Phase I (up to $300K for up to 2 years to demonstrate a concept)

Brief update

- Uncovered two similarly focused activities
  - MedEd supported by the American College of Physicians and many others.
    - https://onlinemeded.org/spa/our-story
    - This site has a similar focus for what we have talked about for STAM, but focuses on medical studies and more specifically clinical practices. Uncovered two similarly focused activities
  - LearnChemEng focuses on foundational topics for Chemical Engineering and has been supported by NSF and others
    - http://www.learncheme.com/ .
    - This website focuses on foundational methods of Chemical engineering and creating a HELP ENVIRONMENT for students and instructors in ChemEng.

onlinemeded.org/spa/our-story

Apps | Chrome | Member Access - Stat... | Wells Fargo Account... | American Express Log... | Delta - Book a flight | NC State University :... | Other bookmarks

OnlineMedEd Topics Q Bank Case X Coaching App Store About Us Log in Sign up

Our Story

Med school sucked. Information was needlessly overworked and extraneous, materials were expensive, and the sources were disjoined and scattered. We got the job done and did well, but knew there had to be a better way. We had the knowledge, skill and scores to do it. So we went to work; we got a white board, a camera, and started making videos. It worked. People used it. People LIKED it. Our interest is in making

Our mission is to change how medical education is approached, how medical schools deliver it and how students learn it.

lightning.jpg | AIONX Executive Su....pdf | Show all

Type here to search

4:28 PM
9/28/2020

Not secure | learncheme.com

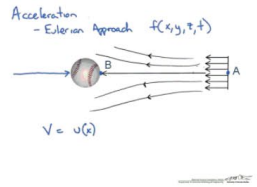
Apps | Chrome | Member Access - Stat... | Wells Fargo Account... | American Express Log... | Delta - Book a flight | NC State University :... | Other bookmarks

LearnChemE

Educational Resources for Chemical Engineering
Department of Chemical and Biological Engineering
University of Colorado **Boulder**

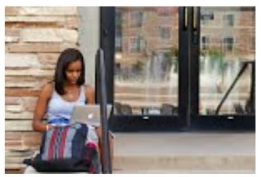
Home | Screencasts | Simulations | Quiz Yourself | Virtual Labs | Student Resources | Instructor Resources | About/Contact Us

See webinar on Chemical Engineering Online Learning



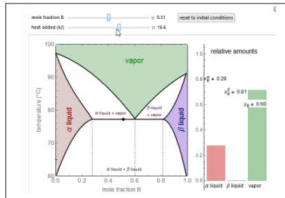
Screencasts

More than 1,700 screencasts, which are short screen captures of a tablet PC with narration. They include example problem solutions, explanations of concepts, software tutorials, introduction to topics, diagram descriptions, and reviews.



Interactive Self-Study Modules

More than 50 modules; most include: introduction, ConcepTests, introductory screencasts, important equations, interactive simulations, quiz-yourself simulations, example problem screencasts, and key points.

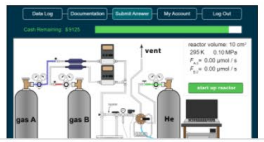


Interactive Simulations

More than 200 chemical engineering simulations that allow the user to determine how system behavior changes when variables are changed.

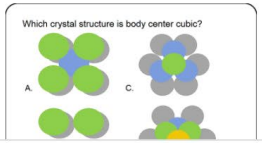
Step-by-Step Interactive Simulations

More than 20 simulations that use a step-by-step procedure in which the user inputs an answer, and then checks the "solution box" to see the correct answer. These simulations are useful for thermodynamics, separations, and/or material and energy balances courses.



Virtual Chemical Engineering Laboratories

Two virtual laboratories (VLs) are currently available and another will be available soon. In these VLs, students can plan



Instructor Resources

More than 1900 ConcepTests, which are conceptual questions that can be used with peer instruction. Three OneNote-based

lightning.jpg | AIONX Executive Su....pdf | Show all

Type here to search

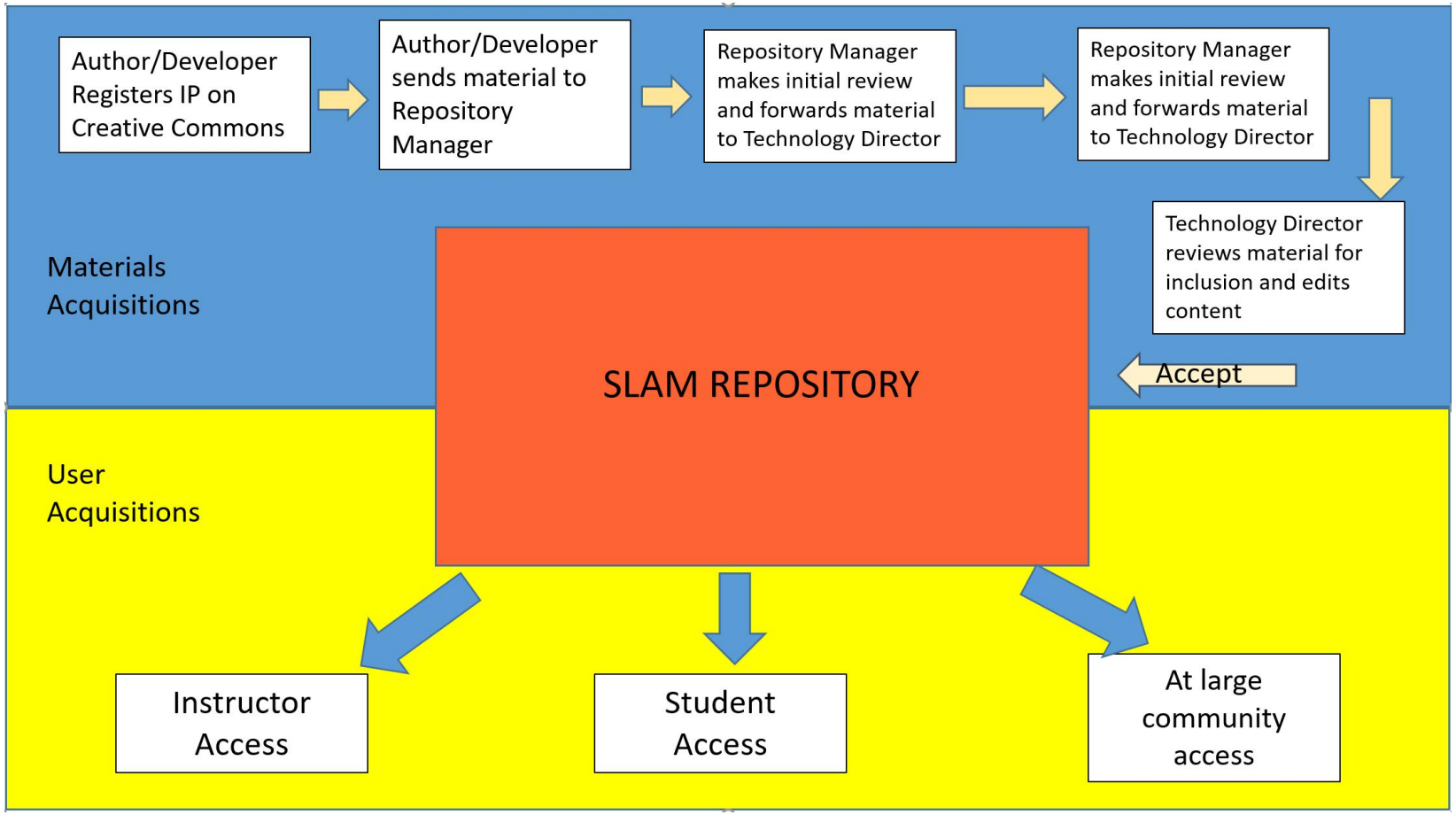
4:31 PM
9/28/2020

SLAM Repository

Welcome to The Shared Learning materials for Advanced Manufacturing (SLAM)

The goal of SLAM is to develop a flexible learning repository for creating flexible teaching environments. The repository will contain modular educational materials for manufacturing instruction to be used by multiple educators, where each instructor retrieves text and video components for specific topics along with other course material specifically related to his/her course. A typical technology instructor will modify and embellish these materials to meet their individual instructional needs. The difference is that the instructor then redeposits these materials back into the repository to create "organic educational materials" that grow and are enriched over time by use for ATM instruction.

Functional Architecture for SLAM



Some specifics

- Organization of data and materials
- How users interface with SLAM
- Implementation on OERCommons
  - Microsite
  - Hub
  - Groups
- OER Commons has several strengths (and a few weaknesses)
  - Web building app
  - Long-term development investment already made
- User interfaces
  - Undefined as pictured
  - Probably course(s)
  - Could be topically

Technical issues associated with a repository

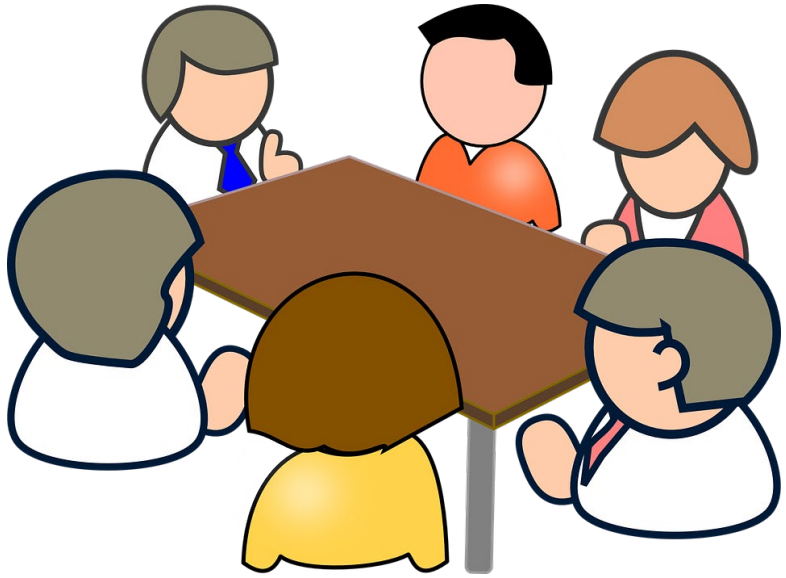
Discuss - Requirements and Goals

- Create a Shared Learning repository
- Provides value to users and contributors
- Sustainable with and then w/o NSF support

Describe - Features, Constraints, and Welfare

Define - Resources, Interaction, Security, Roadblocks

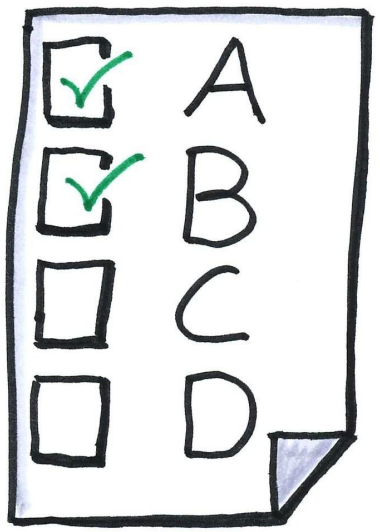
Decide - Platform, Structure, Credit



What should the repository do?

- Store materials
  - Chapters
  - Tests and quizzes
  - Presentations
  - Videos
- Users
  - Students
  - Instructors
  - Administrators
- Features
  - Economic
  - Easy to use

Materials



1. Lectures - Presentations, Notes
2. Examples
3. Tests / Quizzes
4. Textbook Sources
    a. PDF?
    b. TEXT?
    c. HTML?
5. Videos
    a. Lectures
    b. Demonstrations
        i. Lab Safety
        ii. Machine Setup

Topical Areas are almost limitless

-
- Traditional Manufacturing Methods (Richard Wysk and Paul Cohen),
- Foundry Methods (Robert C. Voigt and Paul Lynch),
- Additive Manufacturing Methods (Ola L. Harrysson and Douglas Timmer),
- Hybrid Manufacturing (Guha Manogharan and Thorsten Wuest),
- Design for Production (Gul Kremer and xxx),
- Composites Engineering (Richard Liang and Okenwa Okoli) and
- Manufacturing Control (Russell King and xxx).

Administrative Organization

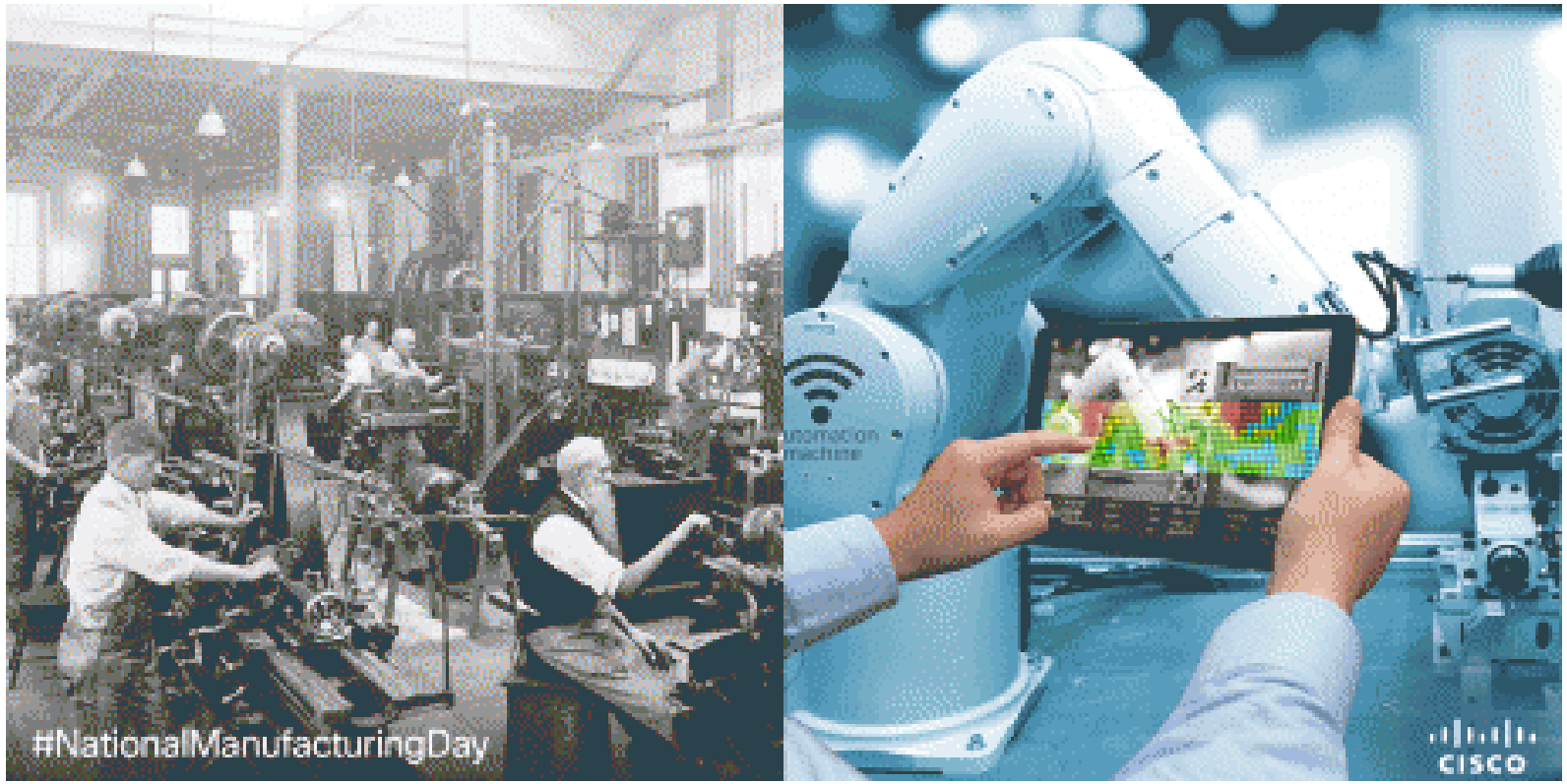
- Start date: August 1, 2021 Completions date: July 31, 2025
- **ISU Prime University**
  - Gul Kremer will serve as Project PI and a SLAM Manager will serve to oversee and coordinate SLAM activities

- **NC State**
  - **Data and Repository Management** (Binil Starly) The Data and Repository Manager for this project will be Dr. Binil Starly, The James T. Ryan Professor in Industrial and Systems Engineering, will oversee data and repository activities. He will be responsible for the management and registration of materials for the repository, and will insure that the repository will be as up-to-date as possibly. Dr. Wysk will serve as Repository Editor, reviewing new repository materials for technical and editorial accuracy.
    - Traditional Manufacturing Co-Directors: Paul Cohen and Richard Wysk
    - Manufacturing Control: Russell King and xxx

- **PENN State University and West Virginia University**
  - **Technical Plan** (Guha Manogharan (Penn State, MNE)) and Thorsten Wuest (WVU (IMSE)) As Codirectors of Technology, Drs. Manogharan and Wuest will continually renew materials solicitations and acquisitions by using Focus sectors and Lead Researchers to solicit and review materials. The Technology Directors will add and delete from the Focus sectors to keep up with new advances and directions in manufacturing. In this role, they will act much like "editors" for journals.
    - They will maintain an active list of contributors and log uses through the website). They will also serve as Hybrid Manufacturing Technology Co-Directors
    - Casting Topic Leaders: Robert Voigt and Paul Lynch
    - Co-Director for Education: Paul Lynch
- **Florida State University/FAMU**
  - FSU/FAMU will oversee the development of materials for Composites Manufacturing Technology.
    - Co-Directors: Z. Richard Liang and Okenwa Okoli

Learning components

- Prerequisite materials: Fundamentals of materials, Mechanics, etc.
- Introductory materials: Motivating, defining and scoping the topics



Types of materials included in the repository

- Text chapters
- Exercises and problems
- Presentation slides
- Quizzes
- Tests
- Videos (empty, except for a few youtube urls)

Major hurdle – sharing IP and getting credit for contributing material to STAM

- Open Education
- OERCommons.org
- CreativeCommons.org
- We are working with William Cross and Michah Vandergraft who are participants in the National Open Education project
- Different ways to overcome these issues
  - MedEd uses a Journal to review and publish many of their clinical innovations
  - LearnChemE awards faculty with contract money to prepare site materials

Summary of where we are and where we're going

- Have got a lot to show for the initial workshop proposal
- Lots of excitement from the *Community of AMT Instructors*
- Good timing (COVID)
- Would like to move forward with a: 1) NSF IUSE Institutional and Community Transformation proposal. We seek to unite multiple universities utilizing a teaching repository (Level 2 award up to $3M) that will create a shared platform for creating and using traditional and new technological materials or 2) NST Institutional and Community Transformation proposal Phase I (up to $300K)

Questions concerning the REPOSITORY