



grants 2012 Departmental Impact Grant

Engineering Education Innovation Center

Teaching Students to Present Research in Video Formats



Ms. Mary Faure and her team will launch a team-based digital video presentation project for 200+ students in Engineering 1181/1182, replacing an in-person PowerPoint presentation. Students will develop multimedia explanations of research projects conducted during the semester, to be presented in a showcase at the end of term and, optionally, made available in iTunes U and other venues. In addition to the impact on the 200+ students in Spring 2013 and the potential of 2,000+ students in future semesters, the project will develop best practices for video assignments in large-enrollment courses, such as equipping computer labs capable of large-scale video production, training students in basic digital literacy skills, and developing standard assignments and assessment rubrics for instructors.

Department of Engineering Education Innovation Center

Project Leads

- **Mary Faure** <faure.2@osu.edu>
Lead, Manager of TCRC in EEIC
- **John Merrill** <merrill.25@osu.edu>
Associate Director, EEIC

Constituents

- **Phil Schlosser** <schlosser.36@osu.edu>
Professor of Engineering, EEIC Scholars Program
- **Bob Gustafson** <gustafson.4@osu.edu>
Director of the EEIC and Honda Professor of Engineering

OCIO/Learning Technology

Project Lead

- **Tom Evans** <evans.1517@osu.edu>
LT Faculty Development Support

LT Constituents

- **Robert Griffiths** <griffiths.44@osu.edu>
LT Faculty Development Lead
- **Henry Griffy** <griffy.2@osu.edu>
LT Faculty Development Support
- **Joni Tornwall** <tornwall.2@osu.edu>
Learning Technology Quality Matters Expert
- **Belinda Hurley** <hurley@matsceng.ohio-state.edu>
Ohio State University Libraries
- **Alan Kalish** <kalish.3@osu.edu>
University Center for the Advancement of Teaching

Engineers must have strong writing and oral communication skills in order to succeed in their professions. Regardless of the type of position they hold, their need to be able to convey information to multiple audiences for many purposes is a large part of their responsibilities. Therefore, it is necessary to begin developing foundational writing and oral communication skills early in our engineering students. The first year program is ideally set up to begin that skill building and allow students to explore three types of reporting: technical documents, description of the design process they learn, and the delivery of several presentations.

With this project, we propose to enhance literacy training (e.g., writing and oral communication skills) by converting an in-person oral presentation assignment to a digital-video presentation format.

Problems

Traditionally, students received instruction in making team oral technical presentations using specified success criteria, and these presentations were assessed during in-person delivery of the presentation in the classroom. However, during semesters, two challenges to the first year program required a response. The first is that classroom sessions are shortened compared to the quarter system; the second is that enrollment in classes required that classroom size be increased to allow for the additional enrollment. These challenges necessitated a move to an out-of-classroom oral presentation assignment.

Further, the nature of literacy skills engineers need to possess continues to evolve. While in-person presentations are a necessary skill, digitally mediated or recorded communication is becoming increasingly common. Traditionally, the culminating technical project involved a team-based oral technical presentation that usually included PowerPoint. Conversion of that final project to a digital video presentation will require the development of training modules for the students to learn the necessary skills. This will require the faculty to learn the process as well, ahead of the students.

The status-quo does not address these issues (i.e., moving the assignment instruction and support to outside of class, building instructor literacy skills, and building student literacy skills).

Opportunities

The change to semesters allowed the opportunity to re-envision both how oral presentation skills were taught and how oral presentations would be delivered in order to extend the students' communication skill set more digitally and creatively. The instructional team envisions an outside-of-class assignment for which students create their technical presentations utilizing edited screen capture with voice over and video footage. The instructors will create multimedia modules instructing the students how to plan and execute a quality oral technical presentation using digital video.

To address the current course issues, we will

- Build assignments that require students to gain skills at using new software that is commonly used to complete digital presentations for upper level classes, capstone design projects and by industry.
- Create instructor led training modules to guide students through several assignments that teach these skills to be accessed anytime/anywhere.

Benefit for Students

- Students will access the instructional modules in a timely way as designated on their homework schedules.
- Students will “take away” from the course not only the written project report and project notebook, but also a digital file of their presentation for use as a demonstration of their technical skills and understanding of the engineering design process. These files will be useful as communication tools for internships and possibly admission to special project teams at OSU and within industry.
- Students will gain skills that will enhance their ability to compete for internships and career positions.

Benefit for Faculty

- Faculty will build the same expertise as required of students and have an appreciation of their student expectations.
- Videos will be delivered anytime/anywhere via the EEIC remote access servers to students registered in the course, and can be reused.
- Faculty will receive feedback on the assignment and process to enhance future assignments.

Project Goals for Students

- Students gain planning, multimedia, and presentation skills.
- Students are better prepared for subsequent courses and future employers.

Project Goals for Instructors / Team Members

- Instructors gain multimedia and presentation skills.

Project Objectives contributing to Project Goals

By the end of Spring Semester 2013, for the EEIC Scholars Program (for 216 students), we will:

- 1) Following UCAT recommendations for incorporating a multimedia assignment into the course
 - a. [Creating Course Goals and Learning Objectives](#)
 - b. [UCAT: Course Skeleton](#)
- 2) Define the multimedia assignment
 - a. Fit the multimedia assignment within the course layout
- 3) Select the software solution
 - a. Select software that offers screen capture and editing, including crop, splice, add text, add audio, slow down, speed up frames.
 - b. Select software costs no more than 300.00 per seat per year to purchase
 - c. Select software that accepts media from many formats and can combine them into one video file viewable in a common viewer such as Windows MediaPlayer and other common viewers
- 4) Select hardware to run the chosen software solution
- 5) Create assessment plans
 - a. Assignment
 - b. Project
- 6) Create assignment instructions
 - a. Team will produce instructional modules that provide the step by step instructions that students require to produce the components of their technical presentations
 - b. Produce an assignment plan that includes iterative, scaffolding techniques, including storyboarding, technical reporting, and multimedia production.
 - c. Project staff become competent in using and applying the concepts of technical video media
 - d. Create materials to “teach the teacher” Materials will include workshops given by key Project Team Members; How to worksheets and sample videos with commentary on how they were created. Links to useful resources.
 - e. Create materials for the students: instructional modules, worksheets, checklists, and homework assignments, surveys, samples of expected video results
- 7) Create a course experience in which:
 - a. Students submit a PDF of the initial design
 - b. Students submit a storyboard draft in MSWord format.
 - c. Students submit a storyboard second draft in PowerPoint or MSWord format.
 - d. Students record SolidWorks designs in Camtasia.
 - e. Students record video introduction segment
 - f. Students record post design team reflection video
 - g. Students edit individual recordings into a complete a video-based engineering design process presentation.

- 8) Determine a video project distribution plan
 - a. Determine access for scholars students and make materials available
- 9) Analyze results from pilot run.
- 10) Submit a conference presentation to the Educause Midwest Regional Conference.
- 11) Team Faculty will present their findings at the ASEE conference in April 2013
- 12) Determine steps necessary for full-scale implementation for Autumn 2013.
- 13) Team Faculty will submit their findings to the ASEE Journal and STC Journal.

In-Scope

- Review and select software that provides the functionality necessary to complete the student's presentations and (hopefully) use that software to create the instructional modules also
- Develop instructional modules to deliver step by step instruction in creating digital technical presentations
- Find example videos and draft components for the instructional modules, such as:
 - Tom Evans' module on updating Campus Cruiser Profile: <http://www.youtube.com/watch?v=xv6dKdFFEmA>;
 - ASABE Landmark videos on YouTube: <http://www.youtube.com/watch?v=1M10MHMLOmE>
 - Student team video from Sp 2012: <http://www.youtube.com/watch?v=OouVn7MhpOM>
 - Example using Solidworks to create an exploded view of a flashlight: <http://www.youtube.com/watch?v=Ows3E-JPNrh4&feature=youtu.be>
 - Water pitcher from Solidworks (examples for students to see how to display their designs while describing the strengths and weaknesses of those designs): <http://www.youtube.com/watch?v=xWDnr8elZOo&feature=plcp>
- Develop written components, assignments, surveys, quizzes and evaluation criteria for the students' digital presentations
- Develop data-gathering methodology for collecting and interpreting the results of the pilot to be used in publications about our project
- Deliver our modules to the 1182 Scholars program (3 sections of 72 students) that concludes at the end of spring semester 2013

Out-of-Scope

- Utilize technical video presentation materials for entire EEIC
- Prepare for full scale release
 - Determine feedback structure and objectives
 - Change materials for scalable class structure
- Train other staff in how to create educational modules
- Prepare materials and access points for EEIC including courses: 1182, 2367, and senior level design projects
- Post final products to display progress and share results with community

Strategic Projects Alignment

- OCIO Digital First

Students

- 1) Each assignment group achieves 80% or greater on the assignment rubric categories of:
 - a. Complete Presentation
 - b. Production Quality
 - c. Content Accuracy
- 14) Students rate the instructor-led video tutorials as helpful.
- 15) Students rate the instructor-led video tutorials as relevant to the project assignment.
- 16) Students rate the video capturing/editing software as available when attempted to access.
- 17) Students rate the video capturing/editing software as simple to use
- 18) Students rate high self-efficacy for creating:
 - a. Storyboards
 - b. Script-writing
 - c. SolidWorks recording
 - d. Video Recording
 - e. Audio Recording
 - f. Video Editing
- 19) Students are highly satisfied with the group video assignment
- 20) Students feel the group video adds value to their professional portfolio
- 21) Students feel the group video will make them competitive for internships/jobs with peers from other institutions.
- 22) Students will feel satisfied with their final technical presentation

Faculty

- 1) Instructors rate high self-efficacy for creating:
 - a. Storyboards
 - b. Script-writing
 - c. SolidWorks recording
 - d. Video Recording
 - e. Audio Recording
 - f. Video Editing
- 23) Instructors do not rate time spent answering questions about how to use technology as burdensome.
- 24) Instructors do not rate time spent answering questions about assignment details as burdensome.
- 25) Instructors rate the student submissions of video-delivered technical presentations as higher quality than traditional oral-delivery of technical presentations

Project Assumptions

- A software package is available to meet our goals for creating student technical presentations
- The price of the software meets our budget
- The time frame for purchasing and receiving delivery of the software meets our time goals
- The project team is capable of learning the software in the time allowed
- The project team can use the same software as the students to produce the instructional modules
- The instructional modules accurately identify the necessary skills for students to produce digital presentations
- The instructional modules accurately present information on the intended skills
- The instructional modules are effective in presenting the information so that the students can gain the skills
- The project team can devise assessment tools that accurately assess the intended skill sets and learning
- The students will learn the skills necessary to produce quality drafted pieces for their assignments
- The students will learn the skills necessary to edit the pieces into a high quality technical presentation in video format
- The students will enjoy completing the modules, assignments and creating their presentations

Projects Risks

Risk Description				Mitigation
Carmen issues			2	Wait until Carmen team resolves the issue
Staffing			2	Adjustment of project plan may be needed / training of replacement/ additional teammates

Obstacles / Constraints

- Distraction from competing priorities within the EEIC
- Distraction caused by busy teaching schedule
- Distraction caused by delivery of workshops
- Distraction caused by training and support needs of several new staff members (TCRC)

Schedule Considerations / Other Projects

Department

- Orientation workshops for EEIC GTAs and UTAs
- Evening grading workshops for GTAs and UTAs
- Training new TCRC staff
- Delivering a new course: ECE 3090
- Digital First Initiative -- iTunes University application for 2367 course

Learning Technology

- Other Impact Grant Projects
- Digital First initiatives

Project Milestones and Major Deliverables

Milestone/Deliverable	Target	Re-
Team learns to use the software and produces satisfactory practice modules	July 23-Aug 3,	Mary
Team learns to use DreamWeaver software and drafts the EEIC Impact Grant website		Andrew
Project Charter Complete	Aug 10	All Team
Team writes plans for the instructional modules and plans for how the modules will be inserted into the curriculum for the pilot, Scholars program Sp 2013---ENGR 1182	Aug 10-Aug 24	Mary
Plans for modules are reviewed and improved	August 27 - Sept 7	Mary
PRODUCTION PHASE		
Team produces modules 1 and 2	Sep-	Mary
Team produces modules 3 and 4	October 1 - 19	Mary
Team produces modules 5, 6, and 7	October 22 - Nov 9	Mary
Team produces module 8	No-	Mary
Team reviews and revises any portions of modules	No-	Mary
IMPLEMENTATION / ASSESSMENT PHASE		
Team delivers course with instructional video modules inserted for Scholars	Jan-	Phil
Team takes incremental assessment of the effectiveness of the modules through surveys, Quizzes, evaluating the quality of students' drafted video segments and evaluating the production of the final presentation	February	Mary
Team adjusts any module content that did not produce the expected results	May 1-May 31,	Mary
IRB		
Team members trained in CITI and COI (those named on IRB application form). <ul style="list-style-type: none"> • http://citiprogram.org • http://orrrp.osu.edu/irb/training/citi.cfm • http://researchonline.osu.edu/conflict-of-interest/ 		
Phase out agreement		
Innovate		

In addition, the following interactions are anticipated:

Idea Labs (Introductions)		LT Team
Blog #1 (Project Launch)		Mary Faure
Idea Lab (IRB)		LT Team

Blog #2 (Charter)		Mary Faure
Idea Lab (Accessibility)		LT Team
Idea Lab (Rights)		LT Team
Idea Lab (TBD)		LT Team
Blog #3 (Project Launch)		Mary Faure
Idea Lab (TBD)		LT Team
Idea Lab (TBD)		LT Team
Blog #4 (Mid-term)		Mary Faure
Idea Lab (TBD)		LT Team
Idea Lab (TBD)		LT Team
Idea Lab (TBD)		LT Team
Idea Lab (TBD)		LT Team