Collaborative Education: Building a Skilled V&V Community

Robert Morris University, Engineering Department
Moon Township, PA, USA
PI: **Dr. Sushil Acharya**
Co-PIs: **Dr. Priya Manohar** & **Dr. Peter Wu**
Academic Development Partners: **Dr. Walter Schilling & Dr. Ali Ansari**

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Project Outcomes

Through a Collaborative Industry-Academia partnership Robert Morris University has developed **40 hours** of active learning tools on Software Verification and Validation (V&V). The developed materials can be used entirely for a new course on V&V or for enhancing an existing course on V&V.

V&V Focus Areas

- ***Requirements Management***
- ***Software Reviews***
- ***Configuration Management***
- ***Software Testing***

Student Competencies

Course modules allow students to gain experience & expertise in the following skill sets:

- ***Communication Skills***
- ***Applied Knowledge of Methods***
- ***Applied Knowledge of Tools***
- ***Research Skills***

Target Population

The developed materials can be used for

- ***Junior/senior Undergrads majoring in software development fields of study***
- ***Software Practitioners for on the job training***

Academic Development Partners:

Milwaukee School of Engineering, WI, Virginia State University, VA

Industry Development/Implementing Partners:

Eaton Electricals (Electrical meters), ServiceLink (Mortgage), JDA (Supply Chain), PNC/PINACLE (Banking), ANSYS Software (Simulation)

Active Learning Tools Topics

Software V&V Topic	Exercise Topic	Case Study Topic	Video Case Study Topic
Requirements Management	• Ambiguous Questions	• Requirements from a Customer Perspective - Ambiguity	• Requirements Analysis Scenes
	• Business Requirements and Functional Requirements	• Understanding User Requirements	
	• Clarifying User Requirements		
	• Needs Statement to SRS		
	• Needs Statements to User Requirements		
	• Requirement Ambiguity		
	• Stated and Implied Requirements		
Software Testing	• Cost Effective Testing Approach	• Test Case Development	
	• Test Cases for a Given Requirement	• Performance Testing/Load Testing	
	• Testing Tools	• A Software Test Plan (STP)	
	• Understanding Testing		
Software Reviews	• Code Inspection	• Importance of Peer Reviews	• Formal Inspection Scenes
	• SRS Review	• Peer Review Tools	• Security Inspection Scenario
Configuration Management	• Defect Lifecycle	• Continuous Integration (CI)	
		• Version Control Management System	
Additional Topics	• Deming's 14 Points on System of Profound Knowledge (SoPK)	• Liability for Bad Software and Support	• Scrum Scenes
	• Understanding IEEE Standards	• Software Legal Issues	

What do Instructors and Students say?

Question	Yes	No
The students understood the purpose of the activity	◉	○
The students could complete the activity with the directions that were provided	◉	○
At least one student was uncertain of how to carry out the steps of the activity	◉	○
The activity used a real-world application	◉	○
I could imagine employees carrying out this activity as part of their job	◉	○
Students communicate verbally in a large group while completing this activity	◉	○
Student provided written communication as part of this activity	◉	○
Students Made a formal presentation as part of this activity	◉	○
Students though critically about the content while completing this assignment	◉	○

	Extremely Likely	Somewhat Likely	Not Likely	Unsure
Use the activity again in its original form	○	◉	○	○
Use the activity again with minor modifications	◉	○	○	○
Use the activity again with major modifications	◉	○	○	○
Not use the activity again	○	○	◉	○

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Addresses essential content related to V&V	◉	○	○	○
Promotes higher order thinking	◉	○	○	○
Increases students' problem solvins skills	◉	○	○	○
Requires student collaboration	◉	○	○	○

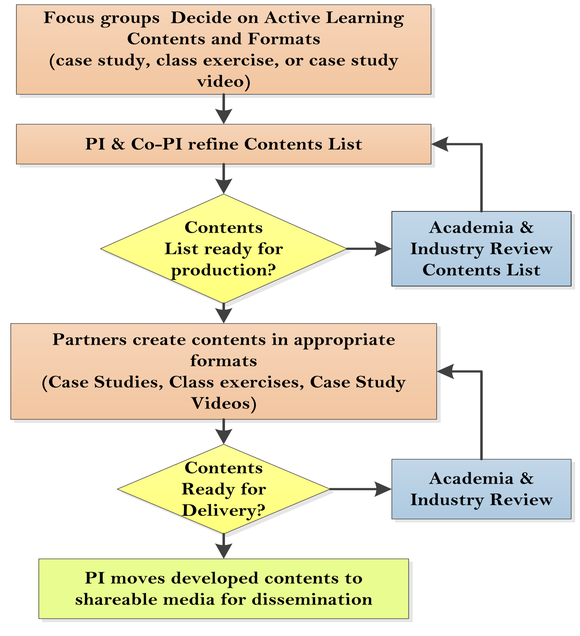
Academic Implementing Partners:

Auburn University, Bowie State University, Clarion University, East Carolina University, Embry Riddle University, Fairfield University, Keenesaw State University, Milwaukee School of Engineering, Montana Tech, ORT Bruade College (Israel), University of Michigan at Dearborn, Virginia State University

Video Case Study Samples

A scene from "SCRUM Scenes"

Content Development Methodology



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