“Technical skills are important, but without employability skills, technical skills are merely commodities. Employability skills turn intellectual commodities into intellectual capital.”

– 2007, Peter Saflund

Information Technology Workforce Skills Study, Broadening Advanced Technological Education Connections

Project Summary

• Evidence reveals a lack of employability skills in today’s technical workforce.

• The Necessary Skills Now project will
  ▪ Work with teams of faculty and employers
  ▪ Develop authentic curriculum projects that
    o Integrate technical content and employability concepts
    o Within content already covered in existing CTE courses
      o 1) Mechatronics/Advanced Manufacturing and 2) Cybersecurity in IT
  ▪ Pilot test, followed by revision and posting on web
  ▪ Create implementation guide and faculty workshops to replicate collaboration/development process in other sectors.
Partners in This Project

• **CORD (Lead and Principal Investigator)**
• **CSSIA (Partner and Co-PI)**
• **SC ATE (Partner and Co-PI)**
• **FLATE (Partner)**
• **NSF (Funding, Sponsor)**

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What Employability Skills?

*Six major categories* of employability skills, are repeatedly mentioned in workforce surveys and research reports:

1. Teamwork
2. Problem Solving
3. Verbal Communication
4. Written Communications
5. Dependability/Ethics
6. Planning & Organizing
Curriculum Development by Employer + Educator Teams

• Team players recommended by Advisory Board members.
• Form teams (pairs) of employers and educators.
• Each team will develop one integrated project.

Employers provide authentic industry scenarios for the context of the integrated project.

Educators serve as the instructional designers.

Face-to-face start-up event facilitates the collaboration.

Online content development environment (Blackboard).

We will document and “package” this development process to enable replication in other sectors (template, profess. develop.)
Deliverables

• **12 integrated projects** (6 advanced mfg, 6 cybersecurity)
  ▪ Complete, workplace-relevant, classroom-ready materials
  ▪ Addressing one or more employability skills
  ▪ Collaboration infrastructure to facilitate employer-educator development teams.
  ▪ Pilot testing of integrated projects

• **Faculty implementation guides**
  ▪ Overview and support of projects (requirements, procedures, assessments, etc.)
  ▪ Suggestions for implementation, modification, extension.
  ▪ Integrated project template for future developments

Deliverables (continued)

• **Faculty development workshops** (for educators):
  ▪ How to identify intersections of technical and employability content within a program of study
  ▪ Partner with employers to develop authentic industry scenarios
  ▪ Design an effective integrated project (from a template)

• **Project website:** [NecessarySkillsNow.org](http://NecessarySkillsNow.org)
  ▪ Recruit pilot sites
  ▪ Disseminate integrated pilot projects
  ▪ Promote faculty workshops
  ▪ Encourage development in other sectors
  ▪ Clearinghouse for developed projects
Now: Integrated Project Development

1. Identify technical and employability topics for integration.
2. Organize topics that might fit a project idea.
3. Refine a project topic idea: workplace contexts (from industry) plus instructional design features (from faculty).
4. Real-world/industry scenario-activity ideas
5. Draft project activity details using a Template.
6. Review, pilot, revise, disseminate.

Now: Developments Underway for Advanced Manufacturing

• Statistical Quality Control Project with a Focus on Building Necessary Work Skills
• Drone Assembly
• Design and Production of a Bicycle Pedal for High End BMX Bikes
• Batch Mix System for Polyisocyanurate Foam Insulation
• Manufacturing Made Real – Developing Employability Skills for Mechatronics Students
• Ethics Through Technical Tolerancing and Quality Standards
Now: Developments Underway for Cybersecurity

- Forensics at a Student Run Data Center
- Perimeter Security at a Student Run Data Center
- Assessing Cybersecurity Management Processes and Designs
- Vulnerability, Risk, and Threat Management
- Creating an Information Security Policy
- Organizing and Planning a Security Awareness Campaign

NEXT: Pilot Testing

- Identify postsecondary schools with programs in:
  - Advanced Manufacturing
  - Cybersecurity
- Develop and Deliver professional development for:
  - Implementing the projects/activities
  - Collecting data
  - Reporting on the experience
- Suggested stipend: $250 (details to come)
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