DEVELOPING PROJECT BASED LEARNING FOR AGRICULTURAL SYSTEMS TECHNOLOGY COURSES

MICHAEL L. PATE, KELSEY HALL, BRUCE E. MILLER, RHONDA MILLER, F. RICHARD BEARD & ROYCE HATCH
SCHOOL OF APPLIED SCIENCES, TECHNOLOGY, AND EDUCATION
COLLEGE OF AGRICULTURE AND APPLIED SCIENCES
UTAH STATE UNIVERSITY
OBJECTIVES

• Discuss background and significance of PBL

• Identify challenges faced with utilizing PBL in Agricultural Systems Technology (AST)

• Discuss implementation and experiences with integration of PBL throughout AST curriculum.
BACKGROUND AND SIGNIFICANCE

• Balance of Curriculum Demands
• Technical Skills
  • Welding
  • Engine Repair/Diagnostics
• "Soft Skills"
  • Time Management
  • Interpersonal
  • Communication
  • Problem Solving

Figure 1. Balancing Curriculum Demands.
DEFINING PBL

- Inquiry-Based Instructional Approach
- Develops learner-centered environments
- Develops students' use of disciplinary knowledge and skills
- Solves real-world problems

PBL UTILIZATION CHALLENGES

• Timing and schedules
• Laboratory facilities
• Student motivations
• Defining instructional role
PURPOSE

• Develop a model for optimizing service to students and stakeholders
• Integrated systems approach to curriculum development
• Develop students' readiness for industry demands
• Facilitate student-driven learning activities
• Application of critical thinking in realistic situations
PBL INTEGRATION EXPERIENCE

• "Gold Standard" (Larmer & Mergendoller, 2015).
• Challenging problem or question
• Sustained inquiry
• Authenticity
• Student Voice & Choice
• Reflection
• Critique & Revision
• Public product
PROJECT ACTIVITIES BY COURSE

• ASTE 1615 & 1625: Agricultural Machinery Engines and Power Trains

• Foundational courses to begin developing technical skill through practice and semi-guided problem solving development
PROJECT ACTIVITIES BY COURSE

• ASTE 2830: Agribusiness Sales & Marketing
  Emphasis is placed on developing multimedia and other technology applications.
  Student developed marketing plan for the Aggie Ice Cream program.
• ASTE 3030: Welding and Metal Project Fabrication
• Welding project plan involving the construction or maintenance of an item relevant to agricultural technology
• Project presentation at the completion of the fabrication process to document reflection, critiques, and improvement considerations
• ASTE 3030: Engine Troubleshooting and Project Management
• Complete equipment troubleshooting and repair procedures
• Failure analysis
• Systematically collect data and interpret results
• Students prepare a reflection report to submit at the end of the project period
• ASTE 4100: Agricultural Structural Design
  - Focuses on the study of building construction and general building design issues
  - Projects prepare students to maintain, evaluate, design, and build agriculture structures
  - Students address construction challenges such as budget, deadlines, and limited resources
• ASTE 4900: Senior Design Project
  - Provides the opportunity for students to develop and exercise creative and imaginative talents in the design of agricultural projects
  - Resembles employment in a professional occupation
PBL activities have served as venues for students to practice team activities and cooperative learning. The success of PBL integration with the AST program has largely been due to a significant administrative and instructional commitment to community partnerships. Further development and evaluation of this curriculum model will continue with PBL principles and practices for a more holistic approach to AST undergraduate education.