Developing Workplace Readiness in Agricultural Engineering Technology Students: A Multi-Evaluation Study of Technical and Soft Skills

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Introduction

High unemployment rates among graduates may reflect gaps in both soft and technical skills required by employers. Jang (2016) highlights persistent disconnects between STEM education and workforce demands across industry, academia, and government. As technology and industry evolve, work increasingly requires continual skill development, adaptability, self-motivation, and engagement (Cirillo, 2016; Tushar & Sooraksa, 2023). In fields such as Agricultural Engineering Technology (AGET), employability skills are especially critical alongside technical knowledge. Employers prioritize competencies such as communication, teamwork, responsibility, initiative, and adaptability (Robles, 2012; Tushar & Sooraksa, 2023). Comparing student self-perceptions with peer and instructor evaluations can offer useful insight into overall workplace readiness and career preparedness.

Theoretical Framework

This study is grounded in David A. Kolb's Experiential Learning Theory (ELT), which explains that learning occurs through a cycle of experience, reflection, conceptualization, and application (Kolb, 1984). Students participated in a semester-long, project-based fabrication experience, reflected through peer, self, and instructor evaluations, and applied feedback to improve their technical competencies and employability skills. ELT provides the proper framework for examining changes in students' workplace readiness throughout the semester.

Methodology

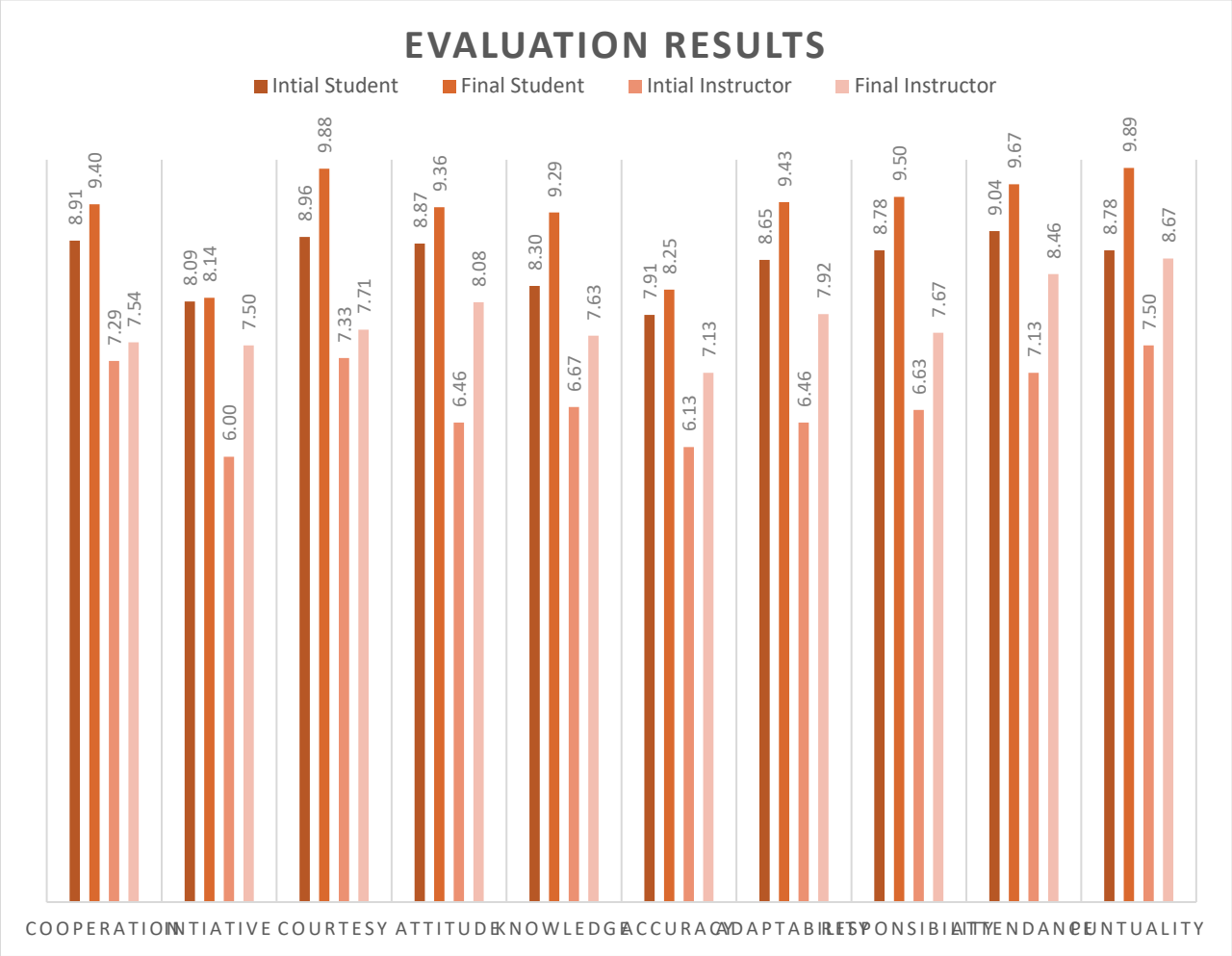
This study involved twenty-five senior AGET students enrolled in AGET 4381: Advanced Metal Fabrication in Spring 2026. Students were randomly placed into seven groups of three and one group of four and completed a semester-long agricultural metal fabrication project. Self-evaluations were administered at the beginning and end of the semester, while the instructor completed independent evaluations using criteria such as cooperation, initiative, attitude, job knowledge, accuracy, work habits, adaptability, responsibility, shop appearance, attendance, and punctuality (1–10 scale; 100-point total). Weekly peer and instructor evaluations also assessed technical skills, safety, work ethic, teamwork, and accountability on a 0–5 scale (30 points per week).

Results

Weekly evaluations showed slight improvement over time. In Lab 1, Responsibility and Accountability were the highest rated (4.84), while Technical Fabrication Skills were the lowest (4.53). By Lab 13, Work Quality and Precision was highest (4.73), and Technical Fabrication Skills remained lowest but improved (4.65). Student self-evaluations increased overall. Initially, Attendance was highest (9.04) and Accuracy lowest (7.91). By the final evaluation, Punctuality (9.89) and Courtesy (9.88) were highest, while Initiative remained lowest (8.14) but improved. Instructor evaluations showed similar gains. Punctuality was highest both initially (7.50) and at the end (8.67). Accuracy remained lowest but increased from (6.13) to (7.13), while Initiative also improved from (6.00) to (7.50). Figure 1 shows a full comparison of initial and final evaluation scores for AGET students across workplace readiness competencies.

Figure 1

Changes in Student and Instructor Evaluation Scores Across Workplace Readiness Competencies



Conclusion

Results indicated overall improvement in workplace readiness, with gains in technical skills, professionalism, and work habits across self and instructor evaluations. Punctuality, responsibility, and work quality were the strongest, while initiative and technical accuracy were weaker but improved. Overall, hands-on, collaborative fabrication projects enhanced both technical competence and employability skills in AGET students.

Implications

These results suggest that hands-on, team-based technical courses strengthen both technical and employability skills needed for workforce readiness. Integrating student-led projects, peer accountability, and multi-source assessments can further enhance workplace readiness by improving initiative, responsibility, and applied technical performance. Overall, these strategies help better prepare students for industry expectations.

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