# Instructional Methods and Laboratory Safety in Agricultural Mechanics: A Crash Course for Student Teachers

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## Introduction

In the early 1990s, the Department of Agricultural and Biosystems Engineering at Iowa State University discontinued offering hands-on, skill-oriented courses in agricultural mechanics for preservice agriculture teachers. Shortly thereafter, preservice and inservice teachers in agriculture expressed concern that new teachers were not prepared to teach agricultural mechanics competencies. Teachers argued that agricultural mechanics was still an important part of the curriculum in secondary agriculture programs. Faculty in the departments of Agricultural Education and Agricultural and Biosystems Engineering discussed the situation but were never able to create an on-campus solution.

Based on a national study of teacher education programs in agriculture, Burris, Robinson, and Terry (2005) concluded that agricultural mechanics remains an important part of the curriculum in secondary agriculture programs. They also indicated that a majority of preservice teacher education programs have assumed responsibility for teaching agricultural mechanics and that more programs would need to in the future. Iowa State University's challenge is consistent with this nationwide trend. However, our approach to this challenge is unique to Iowa.

In 2002, the agricultural education teacher education coordinator (Greg Miller) at Iowa State University worked with two secondary agricultural education instructors to develop and deliver a 1 credit hour workshop on agricultural mechanics. Half of the workshop focused on welding and was taught by Steve Olson. The other half focused on small power equipment and was taught by Jon Davis. This was supposed to be a temporary means of partially addressing preservice agriculture teacher needs. The workshop was not offered in 2003. Because plans for a more comprehensive and permanent solution had not worked out, a revised workshop was developed and offered in 2005 and 2006. This revised workshop is the focus of our poster.

The workshop was a collaborative effort involving the department of Agricultural Education and Studies at Iowa State University, Gilbert Community Schools, and the Iowa Department of Education. Gilbert Community Schools was selected because of its proximity to the Iowa State University campus and the expertise of their teacher in agricultural mechanics instruction. Our guiding belief was that with exposure, training, and hands-on experience in a safe laboratory environment, preservice agriculture teachers would increase their ability to facilitate and coordinate similar environments in their own programs.

## Purpose

The purpose of this poster is to share our experiences in developing and implementing a workshop on agricultural mechanics for preservice agriculture teachers.

## Procedures

- A curriculum for the workshop was designed by Jon Davis and approved by the Department of Agricultural Education. A range of topics were covered, but emphasis was placed on safety, metals, and instructional strategies.
- Greg Miller recruited workshop participants as they applied for spring semester student teaching assignments. Priority was given to students with the greatest need for the agricultural mechanics workshop and who intended to participate in all sessions.
- Funding for materials and supplies and an instructor stipend were provided by the Iowa Department of Education and the Iowa State University Department of Agricultural Education and Studies.
- The workshop was held on Tuesdays and Thursdays from 4:00 to 6:00 p.m. for four consecutive weeks just prior to the beginning of the 12-week student teaching experience.
- Gilbert Community Schools built a new agricultural mechanics laboratory in 2005. This enhanced the learning environment for workshop participants and provided insight into planning, constructing, and using a new facility.

## Results

- Preservice teachers received 16 hours of hands-on instruction that focused on technical content while emphasizing curriculum design and instructional decision making.
- Fifteen students participated in 2005, and ten participated in 2006.
- Participants gave high evaluation ratings for the workshop on an exit survey. They overwhelmingly supported more opportunities like this one.
- Workshop participants were given CDs containing class resources including safety information, skill sheets, and PowerPoint presentations.
- The program has resulted in a continuing collaborative relationship focused on preservice training in agricultural mechanics.
- Increased skill levels, safety awareness, and laboratory planning activities were immediately useful to workshop participants as they transitioned into student teaching.

## Future Plans

We plan to continue offering this workshop until a more permanent solution to the agricultural mechanics education needs of preservice agriculture teachers in Iowa is developed.

## Costs/Resources Needed

Direct costs for the workshop were a $600 instructor stipend and $500 for consumable supplies.

## Reference

Burris, S., Robinson, S., & Terry, R. (2005). Preparation of preservice teachers in agricultural mechanics. *Journal of Agricultural Education 46*(3), 23-34.