

Appropriate learning experiences to help nonfarm students in this unit may include field work in tillage and seeding. Time, space, large number of students, and budget may preclude an introductory course such as Agronomy 114 from offering such experience to each student. Individual students should be encouraged to secure practical production experiences during vacations or through intern type programs.

The results of this study reemphasize the need for nonfarm students to gain applied experiences in order to realize maximum benefit from enrollment in an introductory Agronomy course.

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Evaluation of Agricultural Mechanics Students For Advance Proficiency Standing or "Test Out"

Steve Forsythe

Introduction

Young men and women come to colleges with agricultural programs to pursue a degree in a chosen field of agriculture. In many cases, they are enrolled in the first or basic farm shop classes which involve both subject matter and skills used in teaching and operating a farm shop. Many college age young men and women who are specifically pursuing a career in teaching (or an Agricultural Education degree) or other areas of study are required to take a beginning class in farm shop in addition to other more advanced Agricultural Mechanics coursework. Many of these students already possess a strong mechanics background. This may have been acquired in their high school vocational agriculture program or by related occupational experiences.

In most beginning farm shop courses, students from all walks of life and backgrounds are grouped together. The advanced students are already competent in skills required of the course participants. They also are superior in the objective areas of testing in the cognitive domain. An Advanced Proficiency Standing or "Test Out" procedure should be available to these students.

Evaluation

Evaluation can be defined in many ways. Phipps (4) defines it as a means of finding out the strengths and weaknesses of a program as well as discerning effectiveness. Dobson, Dobson, and Kessinger (1) in **Staff**

Development: A Humanist Approach, maintain that evaluation is based on comparison and is product oriented. In a 1969 article in **The Agricultural Education** magazine, Salmon (5) questions whether teachers were exerting sufficient influence in all phases of agricultural mechanics and evaluation. Obtaining information as to the worth of a product, procedure, or objective is the goal of evaluation. Evaluation has many definitions with no standard or single "correct" definition. Some agricultural educators feel it certainly entails value judgments and/or placing values on things. Farmer (2), an educator of Agricultural Mechanics teachers stated it best when he reported that in trying to reward a student for previous achievement, value judgments are going to enter into any evaluation.

The student who feels he or she should be rewarded for previous training and achievement in Agricultural Mechanics must have a means of being evaluated. In most cases, the role of evaluator falls squarely on the shoulders of the course instructor who is responsible for transferring that knowledge and training to the student. He or she is the course instructor in the beginning farm shop class. Several guidelines or procedures must be developed.

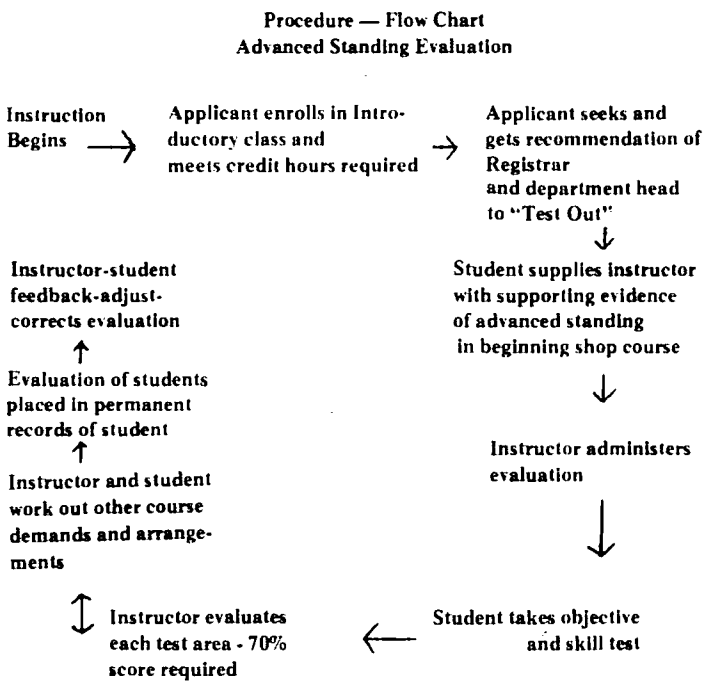
Guidelines - Procedures

These may include:

1. The student or applicant must need the course to meet some requirement for a certificate or degree that is being pursued at the respective college or university. This would make eligible all full- or part-time students enrolled at a college or university.

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Figure 2. Example Work Sheet — Carpentry Skills



2. The student must be enrolled in that institution.
3. The student and instructor should have the approval or recommendation of the department head in which the course is offered.
4. The student may not have taken a "Test Out" evaluation over the farm shop class within the past five months or not more than twice per semester in that semester the course is offered.
5. The students who want to take an Advanced Standing test shall be regularly enrolled in the beginning Farm Shop class and develop any partial examination or "Test Out" with the course instructor. This allows for flexibility — special considerations or situations that may develop as you deal with a variety of students.
6. Students desiring an Advanced Standing evaluation must supply the department head and course instructor with supporting evidence of having mastered the coursework involved.
7. The applicant must score a minimum of 70 percent or above on **both** the objective and competency-skilled level portions of the exam to receive credit.
8. The course instructor is responsible for conducting and evaluating procedures used.

Examinations

The examination-evaluation could cover both objective and skill competency areas found in five content areas. They may include manipulative Farm Shop skills, farm carpentry and woodworking, plumbing, oxy-acetylene cutting and welding, brazing, and electric arc welding. However, basic courses found in colleges differ some in skills emphasis and competency training. The instructor therefore, should develop the examinations-evaluation to cover the skills areas used in his own course.

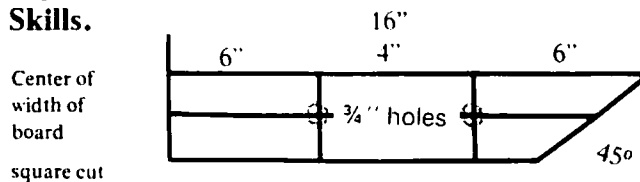
Objective Test

The student who is approved to be "Tested Out" would be given objective questions of the multiple choice variety. Fifty questions would be over general shop. An additional 25 questions would specifically deal with oxy-acetylene gas welding and cutting content areas. Another 25 questions would test knowledge of electric arc welding. Because of the popularity and availability of products and processes related to the electric arc and gas welding and cutting skills areas, 50 questions should be developed specifically for that topic.

Skills Testing

In developing score sheets for use in individual testing areas, old state FFA contest score sheets covering agricultural mechanics may be helpful. Different items to be evaluated can have individual possible score values. Hudson (3) reported that in the state of Virginia FFA contest for engine troubleshooting, different score items such as safety practices had multiples or constants figured in. For example, 6 safety violations would be multiplied by a value of 20, and 120 points deducted from a possible total score that was developed.

Figure 1. Example Work Sheet — Carpentry Skills.



Using the drawing above, construct the wood project to the specifications given. The proper tools should be selected from the tools supplied.

When finished, obtain further instructions from the instructor in charge.

1. Farm Carpentry — Hand Tools

Skill area evaluation would entail the course instructor's providing the necessary tools and an appointment made by the student to insure privacy and a valid testing atmosphere for the applicant. Carpentry skill testing would allow the student to make a small wood project to specifications provided that includes a need for drilling, angle cuts, and planing. Score items and evaluation would be over selection of tools, square cut, angle cuts, position of holes, drilling of holes, overall dimensions, and safety. A possible score and an earned score with a maximum of 50 points would be tabulated. The student would have 20 minutes to complete the exercise, and the instructor would time this activity.

2. Tool Conditioning — Maintenance

Another skills area would cover general shop equipment care and maintenance — specifically evaluating a student's competency in conditioning a twist drill. A tool gauge would be used by the instructor in evaluation, as would actual observation. Evaluation would include angle of cutting edge, cutting edges of equal length, lip clearance, lip to heel smoothness, dead center and cut-

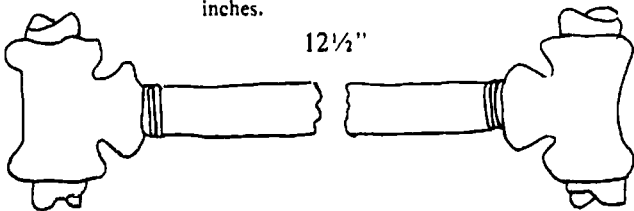
ting lip angle, and safe working habits. A possible score would be 30 points. This exercise would have a 20 minute time limit.

3. Plumbing

Plumbing competency evaluation would be another part of the student's advanced standing test. The Agricultural Mechanics instructor would provide the candidate with the necessary plumbing tools and materials. A drawing or sketch is issued to the student with instructions as to how to cut a 3/4 inch steel pipe a given length. The evaluation score sheet would include possible points for measuring, cutting, and threading. Also lubrication and the correct pipe length would affect the score. Points would be subtracted for each 1/8" over or under the requested length of pipe to be cut and threaded. One point for each 1/8" over or under size would be subtracted from the total score. A time limit can be set.

Figure 2. Example Work Sheet — Plumbing Skills.

INSTRUCTIONS: Using the materials provided, cut and thread the 3/4 inch steel pipe to fit the situation shown in the sketch. The distance between the fittings is 12 1/2 inches.



Evaluation Score Sheet

Item	Possible	Points
1. Marking pipe	2	_____
2. Cutting pipe	4	_____
3. Threading end 1	4	_____
4. Threading end 2	4	_____
5. Lubricating	1	_____
6. Correct length of pipe (Subtract 1 pt. for each 1/8" over or under size)	8	_____
7. Safety	2	_____
TOTAL	25	

4. Oxy-Acetylene Cutting

Oxy-acetylene cutting skills would test the applicant's competency in turning on, adjusting, and using oxy-acetylene equipment. Instructions provided would direct the student to mark a piece of mild steel plate 3" x 6" with materials and tools provided. A 2" diameter round hole would be cut and centered in the piece. The student would be allowed 20 minutes to complete the exercise. An evaluation sheet for this part of the advanced test would include evaluation criteria such as:

	Possible	Score	Earned Score
1. Safe working procedures.	10	_____	_____
2. Correct pressures, flame adjustment, and lighting.	6	_____	_____
3. Layout — correct size and hole.	4	_____	_____
4. Four edge cuts straight and smooth.	8	_____	_____
5. Center hole — round, proper size, and procedure.	6	_____	_____
6. Proper shut down procedure.	6	_____	_____
TOTAL	40		

5. Brazing

An instruction sheet and sketch would be provided which directs a student to make a braze butt joint. Adjusting the equipment, selecting the filler rod, proper flux, and spacing the metal pieces properly is expected of the student. All the materials necessary are provided and a possible score of 50 points is the maximum score for this part of the "Test Out."

	Possible	Score	Earned Score
1. Selection of the filler rod	3	_____	_____
2. Proper adjustment of equipment	3	_____	_____
3. Width and buildup — uniform width and thickness	6	_____	_____
4. Appearance — smooth dense ripples, no excess oxidation	6	_____	_____
5. Face of weld — slightly convex, free of voids and high spots	6	_____	_____
6. Edge of bead — good fusion, no overlapping or undercutting	6	_____	_____
7. Beginning and ending — full size, well filled puddle	6	_____	_____
8. Penetration — complete without burn through	10	_____	_____
9. Safety	10	_____	_____
TOTAL	50		

6. Electric Arc Welding

A vertical butt weld would be required of the student-applicant on two pieces of 1/4" by 2 1/2" by 3" mild steel plate using E6011 or 6013 electrodes. The student could choose between 6011 or 6013 rod as a means of challenging him to demonstrate adequately the use of manipulative skills in electric arc welding. The weld is expected to pass both the root and face bend tests on a hydraulic weld tester. An instruction sheet will direct the applicant and the student will be able to score a possible 40 points. The evaluation sheet could include these score items:

	Possible	Score	Earned Score
1. Safety and proper operation of equipment	10	_____	_____
2. Appearance of the face bend	5	_____	_____
3. Uniformity of penetration	5	_____	_____
4. Root bend test			
A. Cracks more than 1/8"	10	_____	_____
B. Cracks more than 1/8" but less than width of plate?	8	_____	_____
C. Cracks full width of test plate but no more than 1/2" the depth of the weld?	4	_____	_____
D. Complete?	0	_____	_____
5. Face bend test			
A. Cracks more than 1/8"	10	_____	_____
B. Cracks more than 1/8" but less than width of plate?	6	_____	_____
C. Cracks full width of test plate but no more than 1/2" the depth of the weld?	8	_____	_____
D. Complete?	0	_____	_____
TOTAL	40		

Pros and Cons

Possible points to score on the evaluation should be at least 70 percent on **both** the objective test and the skill-competency areas. The Advanced Standing evaluation or "Test Out" would be a way to reward those advanced-trained and very competent students who would enroll in your college's beginning Farm Shop skills course or Mechanized Agriculture course. The advantages of this evaluation would include allowing applicants to meet the Advanced Standing evaluation criteria and free the course instructor to work with one less student. This impact could be considerable if the farm shop class size is 15 or more. The candidate also has proven his competencies and cognitive ability and is rewarded for it. However, other students (usually 20 per section in many beginning courses) with less training and expertise would be better served as far as individual attention given to them and others like them. This evaluation system has drawbacks. It could be time consuming in regards to the time needed to lay out materials and observation time needed by the instructor. The same instructor also must be consistent in his scoring to make for a valid and reliable evaluation. Another area of concern would be to have additional tests in other skill areas of equal demand and application for future "Test Outs." Of course, continual work and further development of any Advanced Standing evaluation is recommended.

Conclusion

Evaluation is a tool that can be used to maintain, strengthen or change for the better that concept or thing being evaluated. In this process, a deserving Agricultural Mechanics student can also be rewarded. Advanced Standing evaluation or "Test Outs" involves making value judgments. But even in the testing-evaluation process itself, the student can be helped in the areas of cognitive, affective, and psychomotor learning and that's what we in education are concerned with, isn't it, helping our students?

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Resources for Teaching and Learning

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Teacher Enthusiasm

Over the years, I have conducted my own survey and study identifying the behaviors of effective teachers. One characteristic that rates high on my list is enthusiasm. Teacher enthusiasm is a factor that stimulates student learning. Teacher behavior is effective in changing a learner's behavior. This we know, for modeling or watching and hearing others is one important way we learn. Enthusiasm is a pleasant and positive emotion or behavior that is easily stored, recalled, and modeled by most learners. In my personal learning experiences those behaviors that effected my emotions most deeply remained the longest in my memory and are the easiest to recall. It was a pleasing experience to read the June 1981 Newsletter of the Phi Delta Kappa, **Practical Applications of Research**, and find many of my own beliefs reinforced as to the role of enthusiasm in teaching. They reported that studies placed enthusiasm high on the list of characteristics of effective teachers.

Enthusiasm comes from a combination of Greek words meaning possessed by a god. An enthusiastic person was someone who was literally inspired by a powerful force. Studies reported by PDK describe the enthusiastic teacher as one who conveys a great sense of commitment, excitement, and involvement with the subject presented. Other research indicates a positive link between attitude of both the teacher and learner and achievement. **Liking** and learning and **liking** and teaching go hand in hand. Enthusiasm really reflects the feeling that you have about a particular subject. Is this behavior something we can learn or is it (as some people say) something we just have or don't have? I came from the school that believes all our behaviors are learned and are not so-called "built-ins." A teacher with appropriate gestures, animation, and eye contact along with an expressive and varied vocal delivery will have students who achieve better on tests than will a teacher who behaves in an unenthusiastic manner. We have to be careful as teachers not only as to **what** we say, but also **how** we say it. Both the verbal and nonverbal acts of communication must display our feelings of enthusiasm about an event, fact, or subject. We know the value of discovery in the learning process and how we feel elated about the feelings of success. We should teach as if we, too, are just discovering or experiencing a fact or behavior that needs to be learned. A

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