ministration working together to upgrade the university, realizing that good instruction is essential in any quality program, a course such as UNIV 7000 will succeed on any university campus. L.S.U. is not unique, but our course and approach to improving instruction seems to be. Remember — one faculty member may come in contact with a hundred or more students per semester. Multiply this by three semesters per year and then by thirty or more years. At least nine thousand students in a lifetime — will this influence be positive or negative? The key is effective instruction!

IDEA SHARING SESSION

NACTA Conference

Freeze-Dried Biological Specimens[1]

Charles G. Wright
North Carolina State University

Specimen identification and examination form an important part in many instructional programs. The life sciences, depending on the particular subject matter, have used as visual aids illustrations in books and pamphlets and on wall charts, photographs on slides and filmstrips, 3-dimensional models, and preserved biological specimens. Specimens have been preserved in different ways, for example, by taxidermy, in fluids and by pressing and drying. Many of the specimens shown by picture or preserved by the various techniques do not display the specimen in a reasonably natural condition of color, texture, and dimension. In fact, one of the suggestions for improvement often given by students in courses where biological specimens or visual representatives of them are used is to include actual specimens, if they are not, and, if they are, to improve the quality of the specimens.

Freeze-drying offers the potential for improved quality in preparing specimens for instructional purposes. The process of freeze-drying specimens has been practiced since 1890, but it has been used effectively only since the late 1950's when the Smithsonian Institution began using the technique for preserving some of their specimens. Since then there has been continued improvement in this preserving technique, so that today over 4,000 specimens have been preserved in this manner at the Smithsonian Institution. Various persons at universities, colleges, museums, and other places are now using the freeze-drying procedure to preserve specimens for both instructional purposes and exhibits for public viewing.

Freeze-drying is a simple process, after the basic techniques and characteristics peculiar to the specimens being preserved are determined. A freezer and a freeze-drier are necessary. Specimens, after being collected and killed, are properly positioned. They are then placed in a freezer and kept frozen there until they are placed in the freeze-drier. The specimens in the freeze-drier are kept frozen while being dehydrated by sublimation. Sublimation occurs because a vacuum is drawn on the drying chamber. Dehydration or drying time varies from a few hours to nine or more months, because plant and animal specimens have different permeabilities, as well as different sizes.

Examples of freeze-dried materials are many. Plants such as fungi, cacti, orchids, and ferns preserve well. Animals, ranging from nematodes, soft-bodied insects, spiders, mites, millipedes, snakes, turtles, birds, small mammals, fish and alligators, have been thus preserved. The developmental stages of various animals are good candidates for preservation, as well as body organs, including but not limited to the lungs, heart and brain and portions thereof. Even artifacts, such as salted beef taken from a ship submerged in the Missouri River since 1865, have been freeze-dried and preserved.

There are references on the various aspects of freeze-drying. An excellent reference which gives a very thorough discussion of freeze-drying from its early years through ca. 1979 is that of Hower (1979). The book is of extreme value to both the novice and the person who has had experience in freeze-drying techniques, since it goes into many details for freeze-drying equipment, the methods used with different plants and animals and, in addition, it contains an extensive list of references.

Time, experience, and response of students have shown that freeze-dried specimens are a valuable addition to many courses and add to the quality of instructional materials, with improved comprehension and learning by students and the subsequent upgrading of the course.

Literature Cited

Hower, R.O. 1979. **Freeze-drying biological specimens: a laboratory manual.** Smithsonian Institution Press, Washington. 196 pp.

[1]**The author is indebted to Mr. Jiles Harrell, Dr. Harry Moore and Mr. Fred Scott, (1) Harrell's Pest Management Service; (2) Entomology Department, North Carolina State University; and (3) North Carolina Museum of Natural History, respectively, who furnished information, and encouragement in the preparation of this article.**

Enlarged Photographs — An Overlooked Teaching Aid

Thurman T. Thomas
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Monroe, Louisiana

The enlargement of color photographs has been a very logical development in a continuing search for new and innovative ways to improve the laboratory in introductory crop science. The laboratory employing the audio-tutorial approach already has the normal compliment of visual aids such as color slides, single concept loop films, brochures, bulletins, graphs, and charts. Also, fresh, dried and frozen plant specimens are regularly utilized in the various laboratory units. Even with all of these aids there were many questions being asked each semester by a large number of students — questions usually dealing with some minute part of the

plant anatomy. Questions repeatedly asked included the following: "Is this the stipule?", "Where are the nodules on this seedling?", "Does this legume seedling have pubescence?", "At which end of the hilum do I find the micropyle?" and other very similar questions. Apparently the single concept loop films, color slides, and the diagrams were not adequate.

Placing a properly labeled enlarged photograph at the laboratory station where the students are picking up the plant samples for study has greatly improved their responses to questions concerning basic grass and legume anatomy. There are definitely fewer questions concerning basic anatomy being asked during and after the laboratory sessions.

A satisfactory procedure to use in preparing the enlarged photographs for laboratory usage is as follows:

> Attach the 11 x 14 inch color enlargement to a 15 x 20 inch illustration board by use of double stick tape or other mounting adhesive. Cut a piece of 0.005 gauge clear acetate to fit the illustration board. By use of a two-inch wide strip of clear self-adhesive plastic, seal each side of the clear acetate to the illustration board. This clear protective covering will prevent scratching or other damage to the color photograph. Vinyl plastic lettering of various sizes and colors are available for adding the necessary identification to the enlarged photographs as deemed necessary by the laboratory instructor.
>
> When not in use the photographs should be stored in a dark place to prevent fading by ultra violet light. For constant display, a top covering of glass would be recommended instead of the clear acetate covering.

Currently the price for enlarging a color slide to an 11 by 14 inch color print is $11.00. The additional materials to prepare and protect the color print will cost approximately $2.00. Once prepared these photographs should retain their quality and not require any expenditures for upkeep provided care in handling and storage is exercised. The crops laboratory currently has ten enlarged color photographs which have been in usage for five years and still are of very high quality and have had no expenses for upkeep.

These enlarged color photographs can and often should be included as an integral part of the classroom or laboratory presentation as they have some advantages not offered by slides, films and other visual materials. Also, in comparison to many other visual aids, they are relatively inexpensive when considered over their useful lifetime.

Field Based Agricultural Skills Workshops For Students Deficient In Practical Agriculture Experience

James H. Mortensen
Associate Professor of Agricultural Education
The Pennsylvania State University

Agricultural educators are discovering the fact that their students have changed markedly. Whereas in years past many agriculture majors were former students of vocational agriculture, such students are clearly in a minority today. In fact, current Penn State College of Agriculture student enrollments are composed of less than 20 percent who have been former students of vocational agriculture. Not only have these students not been former students of vocational agriculture, but they have also not lived on a farm or worked in other areas of agricultural industry.

A College of Agriculture study conducted during Fall 1979 Orientation surveyed 495 first- and second-year students on their residential origin. The data, presented in Table 1, indicate that only 21 percent of these students came from farms. The majority of these students had a genuine and sincere interest in agriculture. However, they were disadvantaged because they did not have the basic skills and knowledge of the field. Their preparation was deficient in practical hands-on experiences in areas of agriculture for which they would be seeking employment. Thus, new opportunities for obtaining vital practical experiences were needed to supplement the University courses in agricultural science and technology.

Table 1. Residential Origin of First- and Second-Year Agriculture Students at University Park, August 1979.

Residential Origin	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Farm, 60% or more of income from farm	41	14	15	8	56	12
Farm, less than 60% of income from farm	28	10	18	9	46	9
Rural, non-farm	60	20	37	19	97	20
Village under 2,500 population	28	9	13	7	41	8
Town, 2,500-24,999	70	23	60	31	130	26
Town 25,000-50,000	33	11	22	11	55	11
Metropolitan, over 50,000	40	13	30	15	70	14
Total	300	100	195	100	495	100

Meeting the Needs

In an effort to improve this situation, and with the aid of a project funded by the Pennsylvania Department of Education, field based skills workshops were planned and are being offered to develop and enhance the competence of undergraduate agriculture students in the areas of animal, plant, and soil science; agribusiness management; and agricultural mechanics. Intended primarily for individuals preparing to become teachers of vocational agriculture and agricultural extension agents, the workshops are offered during evenings and weekends as Ag Ed 297 "Special Topics." Enrollment for credit is optional. Each workshop focuses on a given competency area such as land classification, sheep management, and landscape skills.

Assessing Individual Needs

Preassessment of the student's competence is an important component of the advising and counseling function. Agricultural skills inventories are used by students to assess their ability to perform basic skills in agricultural mechanics, production agriculture, horticulture, and

agricultural resources (see Appendix A). When completed, the student makes an appointment with an advisor to discuss the inventory. In consultation with the advisor, the student develops plans for additional skill development in those areas identified as being weak or deficient. The plan (Appendix B) may prescribe coursework, internship experiences, and selected field based agricultural skills workshops. The agricultural skills inventories are used for purposes of advisement only and do not become a part of the student's permanent records.

Summary of Procedures

The workshops are field based (off-campus) on commercial farms and in nearby high school vocational agriculture departments where participants are afforded the opportunity to practice and perform the tasks. Farmers, county based agricultural extension agents, and vocational agriculture instructors are employed as resource persons to conduct the workshops. Materials and supplies for each of the workshop centers are purchased with project funds. Bus/van transportation is also provided for the students.

Annual meetings for the field based resources persons are held at the University. The current "state of the art" of agricultural competencies needed by agricultural educators is reviewed and analyzed with a view to determining their use in the field based workshops. University instructors and field resource persons collaborate in the development of plans for delivering instruction and assessing participant performance. In skill areas where they are available, task instruction sheets (Appendix C) serve as the nucleus of instruction and provide an instrument for assessing performance.

An Example of a Workshop in Sheep Management

Let us examine a recent sheep production workshop. This workshop was one in a series of five evening meetings to teach paravetical skills. The purpose of this 3½ hour session was to develop eight sheep management skills. The skills were: catching a sheep, making an instant sheep halter, determining the age of sheep, determining the rectal temperature of sheep, making an intramuscular injection, deworming sheep with a dose syringe, castrating, and docking. After each of the skills was demonstrated by the resource person (a vocational agriculture teacher), the participants were given an opportunity to practice the skill. When the participants felt they were prepared, they demonstrated their competence at performing each of the eight tasks. The resource person assessed each participant's performance using a task evaluation form (Appendix C). Students who failed to obtain a score of 85 percent or greater were asked to repeat the task.

A Challenge to the Profession

In general, today's beginning agriculture students have less technical competence and less practical experience than did students ten, twenty, and thirty years ago. However, let us not belabor the point that today's ag students can't caponize a chicken or can't calibrate a grain drill. Rather, we need to accept this challenge and design and implement programs and teaching strategies that capitalize on strengths and provide remedies for weaknesses. The field based agriculture skills workshop is one alternative found to be effective in developing and enhancing the competence of undergraduate agriculture students. By utilizing differentiated staffing — college faculty, vocational agriculture teachers, county based agricultural extension agents, farmers and agribusiness personnel — the theoretical base and the practical application of agriculture can be taught together resulting in a synergistic learning environment.

APPENDIX A
Sample Of An
Agricultural Skill Inventory

Department of Agricultural Education
The Pennsylvania State University

BASIC AGRICULTURAL MECHANICS SKILLS INVENTORY

Instructions to the student: Rate yourself on each of the "hands-on" skills listed below. These competencies have been identified as necessary to effectively teach many vocational agriculture programs. When completed, make an appointment with your advisor to discuss this inventory and to obtain his recommendation for further experience if needed.

Instructions to the advisor: Discuss this inventory with the student when it has been completed. Recommend additional experience if it is needed.

Note: This inventory is used for the purposes of advisement only. It does not become part of the student's Career Placement File and cannot be used by the student or advisor for job placement.

	Can Perform	Cannot Perform
I. Competencies needed in Safety and General Mechanics		
1. Develop safe and efficient shop layout.		
2. Maintain safety instruction record file		
3. Select, maintain, and provide personal safety equipment		
4. Identify, select, and maintain proper fire fighting and fire prevention equipment.		
5. Select and order hand tools		
6. Identify, (inventory, and store hand tools)		
7. Plan tool storage and arrangement.		
8. Use, adjust, sharpen, and maintain hand wood and metal working tools		
9. Select and order power tools		
10. Use correctly, operate safely, and maintain the following power tools:		
A. Portable electric saw		
B. Radial arm saw		
C. Tilting arbor saw		
D. Drill press		
E. Portable electric drill		
F. Grinder - bench and pedestal		
G. Portable grinder		
H. Sabre saw		
I. Band saw - metal and wood cutting		
J. Jointer		
K. Surface planer		
L. Sander - belt, disc and vibrator		
M. Metal lathe		
N. Wood lathe		
O. Steam cleaner		
P. High pressure washer		
Q. Paint sprayer		
R. Welders - electric and gas		
S. Chain saw		
T. Parts washer		
U. Any other specialized tool found in the shop.		

	Can Perform	Cannot Perform
11. Operate and maintain air compressor.		
12. Identify, select and use common hardware and finishing materials		
13. Prepare a bill of materials.		
14. Select and use drawing pencils, measuring devices, scales, etc.		
15. Prepare sketches and simple drawings.		
II. Hot and Cold Metal, Plumbing, Sheet Metal		
1. Safely operate and maintain a forage.		
2. Select, properly and safely use and maintain the hand and power tools commonly used in metal working and plumbing.		
3. Bend, cut, file, drill, rivet and square cold metal.		
4. Ream and countersink holes.		
5. Layout, shape, bend and cut hot metal.		
6. Read a micrometer.		
7. Temper metal.		
8. Cut and tap threads.		
9. Extract broken bolts.		
10. Select a heat source for soldering and solder small holes, seams, and sweat on a patch.		
11. Identify parts, select, lay-out, cut, thread, ream and connect galvanized or black iron pipe.		
12. Select copper tubing and parts, cut, flare and assemble copper tubing.		
13. Identify, cut, and assemble plastic pipe.		
14. Select and maintain water pumps and valves.		
15. Determine carrying capacities of water pipes.		
16. Determine volume capacities of water systems.		
III. Electric Arc, Oxy-acetylene, TIG, MIG, Welding		
1. Select arc welding machines, equipment and electrodes.		
2. Safely operate and maintain arc welders and equipment.		
3. Safely set up, operate, and adjust a carbon arc torch.		
4. Correctly identify metals.		
5. Strike an arc and run a bead.		
6. Make a bull weld - all positions.		
7. Make a lap weld - all positions.		
8. Make a fillet weld - all positions.		
9. Make a corner weld - all positions.		
10. Weld cast iron - (back step method).		
11. Cut and pierce with the arc welder.		
12. Braze with the carbon arc.		
13. Hard surface with the arc welder.		
14. Connect the welder for battery charging.		
15. Connect the welder for thawing pipes.		
16. Connect the welder for soldering.		
17. Interpret welding symbols.		
18. Cut with air-arc attachment.		
19. Select oxy-acetylene welding and cutting equipment.		
20. Safely assemble, operate, and maintain oxy-acetylene equipment.		
21. Select proper flux, rods, and tips for gas welding.		
22. Braze, weld, and cut metal with oxy-acetylene equipment.		
23. Select and apply hard surfacing materials.		
24. Apply silver solder.		
25. Select, operate and maintain a TIG and MIG welding machine.		
26. Weld aluminum, mild steel, stainless steel and aluminum alloys with TIG equipment.		
27. Select rods for TIG equipment.		
28. Operate and push and pull type MIG.		
29. Select wire for the job with MIG welding.		
IV. Power and Machinery		
1. Understand the principles of the two and four stroke cycle engines.		
2. Identify type, size, and make of small engines.		
3. Lubricate, service and maintain small engines.		
4. Trouble-shoot small engines.		
5. Repair and overhaul small engines.		
6. Operate and maintain a small engine dynamometer.		
7. Identify tractor type, size and make.		
8. Lubricate and service tractors.		
9. Maintain and repair tractor.		
10. Overhaul tractor engine.		
11. Use and maintain an engine overhaul stand.		
12. Operate and maintain engine overhaul and repair equipment (valve grinder, valve seat grinders, ridge reamers, sleeve pullers, cylinder, gauge hones, deglazers, etc.).		
13. Use a battery charger and a hydrometer.		
14. Operate engine part testing equipment. (timing light, coil and condenser tester, spark plug tester, compression gauge, techometers, etc.).		
15. Install and adjust coil, condenser, points, spark plug, voltage regulator, etc.		
16. Use and maintain parts washer, steam and high pressure cleaners.		
17. Operate engine performance testing equipment (exhaust analyzer, alternator-generator tester, oscilliscope, fuel pump tester, vacuum gauge, nozzle testers, tach-dwell meter, etc.		
18. Safely operate tractors.		
19. Understand principles of hitching.		
20. Understand principles of hydraulics.		
21. Select, use, and maintain hydraulic regulators, lines, pumps, valves, actuators, and reservoirs.		
22. Operate hydraulic test equipment.		
23. Select, operate, adjust, and maintain tillage equipment (plows, disks, harrows, and cultipackers).		
24. Select, operate, adjust, and maintain planters and grain drills.		
25. Select, operate, adjust and maintain cultivators, and rotary hoes.		
26. Select, operate, adjust, and maintain harvesting equipment (field harvestors, balers, corn pickers, combines, etc.).		
27. Select, operate, adjust and maintain storage equipment (silo blowers, unloaders, self-unloading wagon, augers, conveyors, elevators, etc.).		
28. Select, operate, adjust, and maintain drying equipment.		
29. Select, operate, adjust, and maintain feed preparation equipment (hammer and roller mills, grinder blenders, etc.).		
30. Select, operate, adjust, and maintain manure and fertilizer handling and spreading equipment.		
31. Select, operate, adjust, and maintain field and orchard sprayers.		
32. Select, operate, adjust, and maintain composters, and shredders.		
33. Select, operate, adjust, and maintain rototillers.		
34. Select, operate, adjust, and maintain turf equipment (mowers, thatchers, aerators, edgers, weeders, etc.)		
35. Select and maintain milking machines, milk handling and milk cooling equipment.		
36. Use parts manuals and parts ordering procedures.		
37. Maintain a repair and servicing record filing system		
38. Maintain agricultural power equipment and machinery library.		
39. Identify, operate, select, and maintain power transfer devices for agriculture power machinery.		
V. Concrete and Masonry		
1. Practice safety at all times.		
2. Properly locate, plan for proper drainage, layout, and determine elevation for a building foundation.		
A. Determine location		
B. Explain proper drainage plan		
C. Layout - square a building		
D. Determine elevation		
3. Select, estimate quantity, calculate proportions and mix concrete.		
A. Select ingredients		
B. Calculate proportions		
C. Estimate quantity of ingredients		
D. Properly mix the concrete		
E. Water-cement ratio		
4. Build forms, provide for expansion, and cast, reinforce, cure, and finish concrete.		
A. Build a form		
B. Make provisions for expansion joint		
C. Make provisions for reinforcement		
D. Cast concrete		
E. Cure concrete		
F. Finish concrete		
5. Identify masonry units and lay, reinforce, and parge concrete blocks, including selection and mixing mortar, and providing for expansion.		
A. Identify masonry units		
B. Select mortar mix		
C. Mix mortar		
D. Lay blocks		
E. Reinforce blocks		
F. Parge blocks		
G. Provide for expansion		
6. Calculate the materials necessary for a concrete block building, including the footers and floors.		
A. Number of units		
B. Concrete necessary for footers and floors		
7. Identify tools and materials used to concrete and masonry.		
A. Tool identification		
B. Masonry unit identification		
C. Ingredient identification		
VI. Competencies needed in Carpentry and Building Construction		
1. Identify frame building types, i.e. studding, pole, etc.		
2. Draw a frame building plan to scale.		
3. Read and interpret building plan symbols and drawings.		
4. Calculate a bill of materials from the plan.		
5. Identify, select and calculate costs of lumber.		

	Can Perform	Cannot Perform
6. Use the framing square.		
A. Lay out and cut a common rafter.		
B. Lay out and cut a stair stringer.		
C. Lay out and cut a brace		
D. Lay out a studded wall including an inside/outside corner, door and window openings.		
7. Identify parts of a stud type structure.		
8. Identify parts of a pole type structure.		
9. Identify, select and use plywood and other sheathing materials.		
10. Measure, mark, square, mitre and saw lumber.		
11. Identify and select roof types.		
12. Identify and select roofing materials.		
13. Choose a roof deck for each roofing material.		
14. Identify and select insulating materials.		
15. Identify and select windows and other materials that admit light.		
16. Identify and select from various ventilation systems.		
17. Identify, select and apply fasteners and hardware.		
18. Identify, select and apply paint and preservatives.		
19. Identify, select and install spouting.		
20. Replace window glass.		

APPENDIX B
Training Plan
Statement of Agricultural Work Experience

TRAINING PLAN—AGRICULTURAL WORK EXPERIENCE
The Pennsylvania State University
Department of Agricultural Education

Student's Name _____ Advisor _____ Date _____

Competency Area	Add. Exp. Needed: Required Before Cert.	Suggested Before Cert.
BASIC AG MECHANICS		
I. Safety—Gen. Mech.		
II. Metal/Plumbing		
III. Welding		
IV. Power & Machinery		
V. Concrete/Masonry		
VI. Carpentry/Const.		
PRODUCTION AGRICULTURE		
I. Beef/Dairy		
II. Sheep		
III. Swine		
IV. Horse		
V. Agronomy		
VI. Poultry		
HORTICULTURE		
I. Landscape		
II. Greenhouse		
III. Floral Mdsg/Design		

Competency Area	Add. Exp. Needed: Required Before Cert.	Suggested Before Cert.
AGRICULTURAL RESOURCES		
I. Fish		
II. Forestry		
III. Mine Land Restoration		
IV. Outdoor Recreation		
V. Wildlife		
VI. Soils		
AGRICULTURAL MACHINERY		
I. Selling Parts/Mdsg.		
II. Set-up/Delivery		
III. Service		

Suggested Type Work Site: _____

Duration: _____

STATEMENT OF AGRICULTURAL WORK EXPERIENCE
The Pennsylvania State University, Department of Agricultural Education

Name _____ Permanent Address _____ Home Phone _____

High School/AVTS _____ City _____ HS Grad. Yr____ Yrs Vo-Ag ____ Yrs 4-H ____

Vo-Ag Teacher Name _____ Highest FFA Degree _____ 4-H Honors _____

Elected Offices Held _____ Current Term Standing ____

SOE Production Project(s) (incl. scope) _____

Directed Laboratory Experience(s) _____

WORK EXPERIENCE (list most recent job first)

Employment Dates		Employer				Type of work performed	Your job Title
Beginning Mo/Yr	Ending Mo/Yr	Business Name	Business Address	Business Phone	Name of Supervisor	(e.g., milking, cropping, greenhouse)	

Your Area(s) of Teaching Interest:

- ☐ production agr.
- ☐ agr. business/ supplies/services
- ☐ agr. mechanics/ machinery
- ☐ Horticulture
- ☐ agr. products (food processing)
- ☐ renewable natural resources
- ☐ forestry
- ☐ cooperative ext.

The information given is an accurate statement of my agricultural experience. (signed) _____ (date) _____

Dept. recommendations for additional experience _____

Advisor's Intls_____ Date_____ ☐ See training plan on back

APPENDIX C

Sample of a Task Instruction Sheet Including the Task Evaluation Instrument

M-7 AGDEX 430/26

SHEEP PRODUCTION.....Performing Technical Skills

TASK: Deworming Sheep With Dose Syringe

Introduction:

Shepherds deworm sheep and lambs to control internal parasites. There are a variety of approved methods of deworming sheep and lambs. One method is the use of a dose syringe. Dose syringes are designed to place 1/2 to 4 ounces of liquid dewormer directly into the gullet of the sheep.

Assignment:

Using a dose syringe, drench sheep with recommended amount of dewormer for purpose of controlling internal parasites.

Task-Objective:

Given appropriate tools, supplies, and two mature sheep, learner will deworm (drench) mature sheep using a dose syringe filled with recommended dose of liquid dewormer according to instructions provided. Performance will be evaluated according to task evaluation on back of this sheet. 100% accuracy is expected.

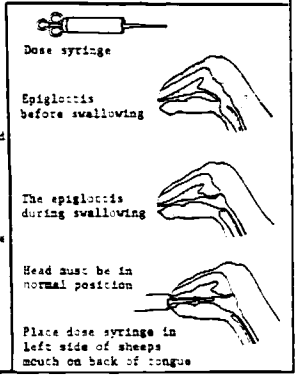
Resources Needed:

1 or more sheep
Container of approved liquid sheep dewormer
1 dose syringe
1 paint stick or other marking device

Instructions:

1. Acquire all needed resources.
2. Place all resources where they are readily accessible to learner.
3. Corral ewes into pen. Pen should be small so ewes cannot freely run about and can be easily caught.
4. Read and follow directions on dewormer package.
5. If dewormer is a powder, mix according to directions with the recommended amount of water.
6. Place end of dose syringe (dose pipe) into liquid dewormer, pull plunger until recommended dose (as shown on plunger) is contained in barrel of dose syringe.
7. Quietly and slowly enter pen with sheep and properly catch one ewe and restrain (see instruction sheet M-1 or M-2).
8. Keeping the sheeps head in its normal position, place end of dose syringe in left side of sheeps mouth on back of tongue.
9. As ewe begins to swallow, slowly push dose syringe plunger, forcing liquid dewormer into esophagus.

continued.....



Caution: Do not squirt liquid dewormer rapidly from dose syringe. Squirting could cause liquid to enter sheeps lungs.

10. After ewe has swallowed recommended dose, place mark on top of ewes head with paint stick or other marking device to indicate ewe has been dewormed.
11. Place ewe in clean pen or pasture which contained no sheep for a minimum of three weeks.

TASK EVALUATION

	POSSIBLE	EARNED
1. Learner read directions on dewormer package?	20	___
2. Learner mixed powdered dewormer with water according to directions on package?	15	___
3. Dose syringe was filled with liquid dewormer according to instruction #6?	10	___
4. Dose syringe was placed into sheeps mouth according to instruction #8?	10	___
5. Sheep received recommended dose of dewormer?	15	___
6. Sheep were marked with paint stick to indicate they were dewormed (drenched)?	10	___
7. Sheep were placed in clean pen or pasture after deworming?	15	___
8. Learner cleaned dose syringe with clean water after completing task?	5	___

NOTES

James E. Diamond
1980
Department of Agricultural Education
The Pennsylvania State University
University Park, PA 16802

USING A WORKSHOP STYLE COURSE IN TECHNICAL EDUCATION

Thomas J. Lindahl
Assistant Professor and Agricultural Business Division Chairman
University of Minnesota Technical College, Waseca

and

Howard Olien
Instructor, Agricultural Business
University of Minnesota Technical College, Waseca

Technical education requires the use of different delivery methods to teach the many concepts and competencies needed by students. UMW has used various methods which include lectures and laboratory emphasis, field laboratory experiences, industry seminars, individualized study, and more recently the workshop style course.

Our definition of workshop style includes the use of a variety of instructional methods and settings while offering a very intensive subject matter. Large group lectures, small discussion groups, workshops, panel discussions, symposiums, and large discussion groups are included. This format is not unlike conferences our students may experience in their positions of employment upon graduation.

The workshop style course was chosen to teach the competencies required to start your own business. It has become highly important for a person considering his/her own farming business or related agribusiness to develop competencies that may assist in making this venture successful. The faculty and administration felt that to teach these competencies required the use of a large number of resource people who had been successful in their own businesses or who in some way act as consultants to enterprise owners.

A secondary benefit which results from this style of instruction includes an interchange of ideas between the regular faculty and the large number of resource people and has resulted in very practical instruction for students.

The use of a workshop style course requires a change from the normal college operating methods. The course needs to be quite intensive, and a two-day format was chosen which would include keynote speakers, panels, workshop sessions, and a banquet. In a short period of time, students are provided with a variety of educational experiences.

The course description states that this course is "a workshop style course designed to provide practical concepts and procedures in getting started in farming or in agricultural related or horticultural businesses. Goal setting, acquisition, control, and management of the resources needed to conduct a successful enterprise will be areas highlighted."

After the completion of this course the student will be able to:

1. Establish individual and business goals.
2. Develop a practical plan for completing the initial steps in getting started.

3. Establish budgets, procedures, and plans to acquire the resources needed to get started.
4. Consult and confer with individuals who have successfully started in farming, or agricultural related, or horticultural business and industries.

UMW has offered the workshop style course three times. Enrollments have ranged from 150 to 300 students. Over fifty resource people have been used with each offering of the course. These resource people were successful business owners, farmers, material suppliers, finance representatives, legal representatives, and consultants. Resource personnel are a geniune asset to the course as they provide practical, firsthand, and current information and knowledge which students can put to use immediately.

Keynote speakers highlight the challenges of getting started and motivate the students to become highly involved in the course. A light motivating speech is used as the program for the banquet which is held halfway through the workshop. A final major speaker summarizes and reemphasizes the key points of the workshop and motivates the students to take action on what they have learned.

The course outline for getting started in farming or agri-business includes:

1. A look at the opportunities in getting started, using a keynote speaker.
2. A workshop where students have the opportunity to learn how to establish realistic goals and practice goal setting.
3. Panel discussions of how individuals have gotten started in a business.
4. Symposium on how to obtain financing.
5. Student selected and directed opportunities to visit with resource individuals from various types of farms or businesses in a cafeteria format.
6. A workshop on how business firms develop and survive.
7. Panels of consultants providing an insight into assistance available to individuals getting started.

Students have several opportunities throughout the workshop to interact with resource people. These opportunities allow students to seek out responses to individual questions and concerns. A final student product of the course is the beginning of a plan, with emphasis on the student's goals towards getting started in farming or business. UMW instructors lead small group workshop sessions near the end of the course to review and assist students in refining their goals and their immediate plans.

Evaluations by students have been very positive. Students especially appreciate the opportunity to discuss their goals and expectations with farmers and others who have just started in their own business. The workshop format has been rated highly as a good change of pace from the traditional college format. Students indicate that this course has met the objectives stated earlier as well as other personal objectives. Because of this success, there have been many individuals not a part of the regular UMW student body who are interested in the course and have or plan to enroll in the future.

The workshop format has proven successful as a delivery method for a technical college. This course requires much greater preparation and instructor time than a regularly delivered course. A major commitment must be made by the faculty to work closely with the selected resource personnel and in planning and organizing the course. Some faculty find this commitment interfers with their regular on-going course commitments. In the future, we hope to minimize interference through greater efficiency in organization, such as greater advanced planning, fewer faculty involved, greater consistency in the course organization, and use of resource people from one offering to the next.

Adopting nontraditional course delivery formats provides additional tools that should be used within technical agriculture programs. The workshop format is one of these tools. It is time that we as educators "get started" in considering the workshop and other delivery methods to improve our instructional programs.

Student Performance and Procrastination in Self-Paced Testing

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Introduction

The Department of Veterinary Science initiated a course of instruction in 1979 in basic principles of animal anatomy and physiology for animal science majors in the College of Agriculture at the University of Arizona. The 4-unit course included 3 hours per week of lecture/demonstration/discussion and 3 hours per week of laboratory exercise. The lectures were presented in the traditional manner of classroom teaching using many student handouts, audiovisual aids, anatomical specimens, and models for hands-on experience. The 45 lectures covered all body systems and associated topics needed to provide students with an appreciation of how animal bodies are structured; how the various parts are related; and their physical, biological and functional properties which are important in the maintenance and progression of life. Related laboratory exercises provided the opportunity for students to discover or observe some of the anatomical and functional properties of the various systems.

Departure from traditional methodologies for the testing and evaluation part of the course are described below. The reason for the departure was based upon the philosophy that all students, having an adequate background of basic knowledge, can learn the same material. The differences in individuals are the time and/or effort required to do so, i.e., some learn quickly and others need additional time or ancillary learning aids with which to master the same material.

Methods and Materials

Rather than the customary administering of 3 or 4 hourly examinations and a final exam during regularly scheduled lecture or laboratory time, a self-paced examination schedule was adopted. Students were expected to complete 8 written examinations covering the body systems and a comprehensive final written exam. These exams could be taken in any order, except that the final exam was to be completed after those on the systems. The student took exams when he/she felt prepared and was retested over similar material, upon request, in event of a low score or if the student wanted to improve the score received for a particular test. No time limit was set for completion of an individual examination. The final comprehensive examination served, in part, as the post test and was thus not repeatable.

In event all tests were not completed by semesters end a grade of I (incomplete) was awarded. This allowed students an additional year in which to remove the I by completion of all tests or it would automatically convert to a letter grade of E (failure) by university regulations. During the interim students were not allowed to audit or repeat the course.

Results and Discussion

When students were advised of the self-paced, repeatable nature of exam administration at the first class meeting they were favorably impressed and enthusiastic. Each received written verification of the policy and the consequences of non-completion of exams. Verbal feedback solicited at the end of the 7th week of classes indicated the same enthusiasm existed but with some reservations, namely that a time restriction for completion should be instituted as a stopgap against student apathy and procrastination. At this time only 13 percent of the class was "on-schedule" by timely completion of systemmic examinations.

The bottom line of Figure 1 shows the percent of students completing the course examinations, removing the I, and receiving computable letter grades at the end of the semester (END) and during the following 12 months grace period. The same individuals who were "on-schedule" at mid-term above finished by semesters end. An additional 19 percent finished within 7 days of semesters end and were able to have letter grades computed for the semester. The remaining 68 percent received an I, a mute testament to procrastination. Of this group, 19 percent had not completed any examinations and proportionately more failed to complete additional exams.[1] For example, 32 percent had not completed more than 3 and 68 percent had not completed more than 6 examinations by semesters end. Completions over the next 11 months were a paltry 10 percent but included students needing to take 2 to 5 examinations to remove the I. During the 12th month a surge of student activity resulted in 35.5 percent more completions, many within hours of the deadline. Some students completed as many as 11 examinations, including retakes, during this month. The remaining 22.5 percent of the class received an automatic E. Of this group, the same 19 percent as above did not complete any examinations.

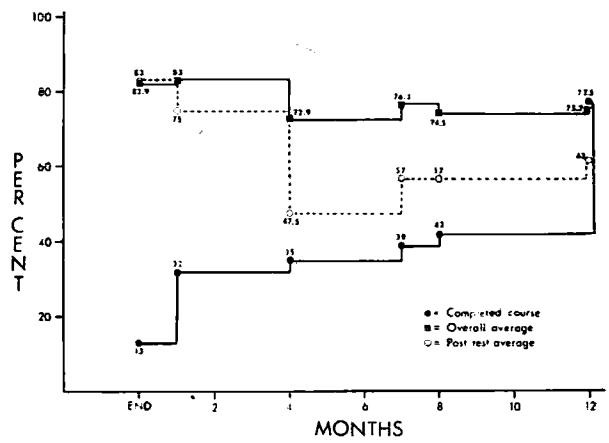

Figure 1 Relationships between the percent of students completing all examinations, average scores on individual examinations, and post test scores for students finishing at semester end (END) and during the following 12 months.

The over-all course average, and their computable letter grade, was consistently lower for late finishers than for on-time finishers as shown by the upper line of Figure 1. On-time finishers averaged a letter grade of B and late finishers averaged a letter grade of C. Twenty percent of on-time finishers received a letter grade of A and late-finishers received no more than a B upon completion. Several D grades were awarded to late finishers and nothing less than a C was awarded to on-time finishers. This was not a penalty by design but a true reflection of student performance and acceptability to the student. The possible exception is in the 12th month late-finishers where the main objective was timely removal of the I regardless of the final letter grade awarded.

The post test was an integral part of the final comprehensive examination. The average of post test scores is shown as the dashed line in Figure I. This average was highest for students who completed the course on time and was consistently lower for all late-finishers and, in fact, was failing or very close to it for those who took this examination beyond 7 days following semesters end. The scores for the final examination ranged from 72 to 86 percent for on-time finishers and 42.5 to 74 percent for late finishers.

Class size at the beginning of the semester was 34 students and 3 withdrew from the course within 30 days. These students collectively had completed 5 exams, 4 of which were in the 50 and 60 percent ranges. The remaining students collectively completed 255 examinations with some individuals completing none and others completing 13 including retakes. The average number of examinations completed by all finishers was 11.33. Ten of the 21 finishers did not repeat any examinations.

Conclusions

Given the opportunity of self-paced testing and evaluations, students, by their own admission, will procrastinate. Students are enthusiastic concerning taking exams when they feel prepared but feel that more

time restraints should be placed upon them for completion to prevent procrastination.

Only 32 percent of students completed all examinations and received a computable letter grade in the semester in which they registered for the course. All others received an I. By the end of the 1 year grace period 77.5 percent of students completed all examinations thereby replacing the I with a computable passing letter grade. The remaining 22.5 percent received an automatic E which is calculated into their cumulative grade point average as 4 units of zero. On-time finishers had higher average scores on individual tests and the post test than late finishers.

Excessive faculty and staff time was required for making up, administering, and grading examinations. Over-all student performance was not significantly different from traditional methods of testing and does not justify the additional time spent in student evaluation.

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Reflecting Course Content in Student Testing

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We have at our disposal a number of different ways to test student mastery of material. These evaluating tools include, but are not limited to, true-false, multiple choice, fill in the blank, short answer, identification, and essay questions, speech/demonstrations, papers, experiments and special projects. The course content, or the nature of the material we are presenting and testing, should determine which of these evaluating tools we use in the classroom. The first five evaluating tools listed above can be grouped together, as they elicit from the student a simple response of a letter, word, phrase or sentence. The last five tools require a more complex response from the student. The first five tools are appropriate for testing a student's understanding of the basic facts and fundamental information which make up an important part of our education process.

Once a student grasps these basic concepts, we generally ask the student to relate these concepts to agricultural production problems. In actual production situations our students will have to deal creatively with the difficulties they face. They will have to put together their knowledge and be innovative in order to be a good farmer, agribusiness salesperson, or extension agent. Fill in the blank questions do not do as good a job of preparing our students to think innovatively or creatively as do the essay questions, papers, etc. We will do a better job of preparing our students for their careers if we closely examine the subject matter in the courses we teach and, whenever possible, reflect these different levels of understanding of material a student will need in our testing.

Courses in a department will differ in the level of understanding they are designed to give the student. Categorizing the level of subject matter understanding a student should have using Bloom's classification system can be a helpful way to match course content with testing levels.

Below are five major classifications of course content, examples of these levels, and the most appropriate methods for testing these levels.

Knowledge asks the student to know basic facts. This can include such things as fertilizer formulas, weed identification, or seeding rates. These are commonly important components of our introductory courses. Multiple choice, short answer, or identification are the best ways to test this level of understanding.

Comprehension of this knowledge indicates the student grasps the meaning of this knowledge. If we ask the students to give an example of a grass weed of soybeans or an example of a high analysis fertilizer, we are testing their comprehension. The testing methods used for knowledge are usually most appropriate.

Application has a student use his or her knowledge in a way different from the way it was learned. Having students design a method for determining the pollination mechanism in an unknown plant would be an example of application. When evaluating a student's ability to apply knowledge, the whole spectrum of testing tools becomes important.

Analysis occurs when the students can break a whole into its elements and analyze relationships between these elements. Students would be capable of analysis of different row spacings in soybeans if they could give the effects the different spacings had on plant growth and development, and how these would affect final yield. Short answer responses can test this level of understanding. However the more complex responses can better indicate a student's depth of comprehension and will better reflect actual situations a student will face once on the job. As a seed salesperson or extension agent, a student will have to explain to a farmer what will happen when narrow row soybeans are planted. The student will not have a choice of five responses, or have a chance to say simply "yes" or "no."

Synthesis of ideas means to take a new whole from the available sum of the parts. For example, as an irrigation equipment manufacturing representative, a person will be called on to design irrigation systems for farms, given soil type, topography, available water source, type of crops grown and cost considerations. The closer we can come in our courses to reflecting these kinds of situations when we test, the better prepared our students will be when they meet the 'real world.' This involves examining our course content and the level of understanding a student will need, and then being flexible enough to offer different types of testing to reflect those levels.

Teaching Job Search Skills - Nebraska Style

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Introduction

Have you ever been approached by a student with this request: "Dr. Jones, could you give me fifteen minutes to help me with my resume?"

While such a request is not unusual, it does point up a common problem among college students: namely, their lack of awareness of what is involved in an effective job search. Often the student feels that if he can just get a resume put together, he will have the magic ingredient that will guarantee him the job of his dreams.

I find that students frequently talk about LUCK in relation to the job search. I suppose all of us do the same thing when we are confronted with a stiuation which appears both difficult and unfamiliar. First of all, we tell ourselves that those individuals who have succeeded were "just plain lucky;" we find it difficult to admit that they might have known how to go about solving the problem more effectively than we did.

Furthermore, if you have been advising seniors in their job search, you probably sense that jobs are not quite so plentiful as they once were. For example, this year's hiring freeze placed on federal agencies has lessened the demand for certain Ag graduates.

Related to the matter of advising seniors in this regard is the question whether a college has an obligation to **place** its graduates or does it have a larger responsibility to **teach** its graduates the **job search process.** I hold that it should be the latter.

In my presentation this afternoon, I would like to share with you some of the things we have learned in offering an employment seminar - Agriculture 489 - to seniors and juniors in our college.

Basic Assumptions

We have developed our course on two basic assumptions:

1. The job search is a problem in marketing, and
2. The job search is a do-it-yourself enterprise.

While a student's academic training in his major will assist him in getting a job because it qualifies him to take on certain responsibilities, the major skill needed in a successful job search is skill in selling oneself.

Using these basic assumptions, we concluded that any course in job acquisition skills ought to call for intensive student participation.

The Job Search Process

Another assumption which is basic to our course is that the job search is a **process** of logical steps; it is not dependent on luck or some magic formula. We divide that process into six steps:

1. Develop career goals
2. Assess one's own experiences, skills, and training
3. Research potential employers
4. Survey the job market
5. Develop appropriate written instruments
6. Present self confidently in the job interview.

Obviously, time does not permit me to dwell on each of these steps. Page 2 of your handout gives a brief description of the assignments required of students to complete each step. Let's look at Step 3: Researching Potential Employers. One assignment asks the student to get a picture of the industry as a whole. After ifentifying "his" industry - ag chemicals, ag credit, swine production, etc. he attempts to answer questions, such as:

Is this industry growing, remaining stable, or going into a decline?

What are the trade associations for this industry?

Which organizations are the leaders in this field?

Another assignment under Step 3 is to compile a comprehensive list of potential employers. Last, we ask students to research in depth companies in which they have a strong interest. They ought to know the company's products and/or services, location of company plants, number of employees, something about the financial stability of the organization; and they ought to know who this firm's major competitors are.

We encourage students to talk with people who are working for the companies in which they are interested. One student phoned a local sales representative to get some information about that company. Much to the student's amazement and delight, the salesman invited him to lunch and talked to the student for an hour and a half! Once students get started in this matter of researching potential employers, they are amazed at the amount of material available to them.

The Mock Interview

Many of our students see Step 6, the job interview, as the most important step in the whole process. They may groan and grumble about the assignments that lead up to the mock interview, but by the sixth week in the course most of them see, for example, that knowing oneself and what he or she has to offer an employer is essential to a confident presentation of oneself in an interview.

Ag 489 is a 6-week course with personnel representatives from business, industry, and government coming the 5th and 6th weeks to conduct mock interviews. Those mock interviews are quite structured. We allow only 10 minutes for the mock interview itself and then 5 minutes for a critique of that interview. Also the student's fellow classmates are observers of the mock interview. Admittedly, this is a very artificial situation, but the potential for learning is high.

Even the critique of the interview is highly structured. First of all, one of our professors gives a mini-lecture to the entire group on how to critique in a professional manner. Our critique sequence immediately following the mock interview calls for the interviewee to critique himself first. This gives him a chance to "save face" in the event that the interview went poorly. On the other hand, we also encourage him to identify those facets of the interview that went well. After the student

critiques himself, the class of his peers - usually 8 or 9 individuals - critiques the interview. Most of the time that critique is supportive and helpful. Last, the professional interviewer critiques the interview. I have been amazed at the forthrightness and frankness of interviewers in sharing with students those behaviors which impress them and those behaviors which "turn them off." Students are very attentive to this kind of information.

We have been criticized by outsiders for the artificiality of our mock interview arrangement. However, most of the people who have been involved directly with the course think the advantages of this system far outweigh the disadvantages. Even students who have been through the course do not suggest that we change the strategy for our mock interview. Consequently, we feel this particular teaching strategy works for us. Another reason for believing that it works is that recruiters who come to campus tell us that they can spot the students who have been through our employment seminar.

Conclusion

Margaret Austin and Harriet Vines, coordinators of career counseling for St. John's University and York College, studied the effects of training on the interview performance of college students. They report two findings:

1. Training can alter performance, and
2. Training is effective in transmitting interview skills.

Our experience at Nebraska supports these conclusions.

Skill in job interviewing is much more than dressing appropriately and speaking in a well modulated voice. It involves extensive self-assessment of one's goals and one's employable assets. It involves researching potential employers and being knowledgeable about the job market in one's area.

I must admit there is an element of luck involved in the job search because some people do get jobs because they happen to be in the right place at the right time. On the other hand, most of the time there is a reason some people are lucky; they are lucky because they have followed this formula:

GOOD LUCK - Being prepared when opportunity knocks.

At Nebraska we try to do our part in preparing students for the job opportunities they seek.

Course Outline

Agriculture 489: Employment Seminar
Prerequisite: Junior standing in the College of Agriculture
One hour credit
Meets the first six Tuesday evenings of the semester, 7-9 p.m.
Faculty/student ratio is 1:10
Textbook: **A Job Search Manual for the new graduate** by Johnson

Basic assumptions of college in presenting course:

1. The job search is a problem in marketing.
2. The job search is a do-it-yourself enterprise.
3. The job search is a process of logical steps rather than being dependent on luck or some magic formula.

STEPS IN THE JOB SEARCH PROCESS

STEP 1. The applicant must develop his own career goals.
STEP 2. He must assess his own experiences, skills, and training so that he recognizes his most employable assets.
STEP 3. He must thoroughly research potential employers so that he understands their employment needs.
STEP 4. He must conduct a survey of the job market in his field so that he is knowledgeable about the supply and demand for entry level positions, necessary qualifications, potential earnings, etc.
STEP 5. He must develop written instruments (resumes, letters of application) which will present his employable assets so well that he is granted interviews on the basis of these resumes and/or letters.
STEP 6. He must present himself confidently in job interviews.

Based on the assumptions given on Page 1, we conclude that a course in job acquisition skills ought to involve a high degree of student participation. The students are given reading assignments related to each step in the process. Listed below are the written and oral assignments related to each step in the process:

STEP 1. DEVELOP CAREER GOALS
— Paragraph giving student's career goals for age 30-35

STEP 2. SELF-ASSESSMENT
— Comprehensive list of student's skills, education, job experience
— Pyramid-of-skills chart showing student's most employable assets

STEP 3. RESEARCHING POTENTIAL EMPLOYERS
— Letter of inquiry for information about a particular firm
— Survey picture of an industry (usually one typewritten page)
— List of potential employers
— In depth report on one company or government agency

STEP 4. SURVEY JOB MARKET
— Two to five paragraph report on job market in student's chosen area
Is job market highly competitive or wide open?
Types of positions open to students with B.Sc. degrees?
Probable starting salary? Potential earnings?
— Write a detailed paragraph describing a particular job which interests you.

STEP 5. DEVELOP APPROPRIATE WRITTEN INSTRUMENTS**
— Letter of application
— Letter accepting job offer
— One other letter (turning down job offer, stall letter, cover letter, etc.)
— Fill out job application form
— Resume (either functional or chronological)

STEP 6. PRESENT SELF CONFIDENTLY IN MOCK INTERVIEW
— Prepare a list of six questions to ask interviewer during interview
— Take part in mock interview
— Critique either mock interview or real-life interview student has had
— Develop interview information card to record appropriate follow-up procedures for given interview

There are additional optional assignments for students interested in working for a government agency and for students interested in applying for graduate school.

**These assignments must meet a certain standard. For example, they must be free of spelling errors.

Advisory Committees At A Technical College

Robert M. Collins
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As the University of Minnesota Technical College, Waseca nears the completion of its tenth year of operation, one of the towering success stories of the college has been the contribution of advisory committees.

The University of Minnesota, Waseca, is a two-year technical college with a single mission of training men and women for semi-professional, midmanagement positions in the broad fields related to agriculture, as well as services to rural homes and communities.

Advisory committee members serve as communications links with industry and keep the college programs in contact with the needs of the industry. An Overall Advisory Committee for the entire college, one committee in each of the seven degree-granting divisions (Agricultural Business, Agricultural Industries and Services, Agricultural Production, Animal Health Technology, Food Industry and Technology, Home and Family Services, and Horticultural Technology), and specialized advisory committees such as Light Horse Management, Rural Family Life Center, and International Students make up the network of advisors.

A balance is maintained of representation of the different areas of emphasis on each of the advisory committees. The chief executive officer of the college, the Provost, works with the elected officers to set the agenda and develop background material for the Overall Advisory Committee. Similarly the Division Chairpersons work with the committees in their own programmatic areas.

In addition to the 20 members on the Overall Committee, the seven chairpersons of the Division Advisory Committees attend, participate in and report at each of the overall meetings. At the Overall Advisory Committee meetings, certain agenda items are covered at each meeting. In addition to the Division reports, these include Progress Reports on Developments at UMW such as enrollment, programs, facilities, and staffing. This provides continuity for members and keeps them informed.

A sheet titled "Agenda Items to Consider for Future Advisory Committee Meetings" is passed out at each meeting. There are 37 topics listed, with space to list other items for consideration. At the May 13, 1981, Overall Advisory Committee meeting additional topics included:

People for the Future of Minnesota Agriculture
Funding and Staffing at UMW
Legislative Requests and Plans
Luncheon with Students and Comments from Guests
International Agriculture Program at UMW
Placement Program and Report
Refreshments and "Brainstorming" Session on Ideas for Development at UMW, "Needs of people of Minnesota that may be met through Technical College, Waseca."

For this meeting, three members were asked to do research and report on the International topic.

The ten-year period has provided enough time to discover some of the things that work well and some of the techniques and procedures that are not effective. Different procedures followed by different advisory committees have also given a comparison.

1. Four meetings a year seem to be more effective than one or two a year.
2. Hold regular meetings, scheduling well in advance. The best system seems to be to schedule for a full year and to follow a pattern such as the third Wednesday of February, May, August, and November.
3. Schedule the necessary length of time for the meeting. The 9:30 a.m. to 3:30 p.m. period works well for the UMW Overall Advisory Committee. Members plan for the full day. The Agricultural Production Advisory Committee meets from 3:30 p.m., through the evening meal, and adjourns about 8:00 p.m.
4. Provide background material. The evidence shows that the members read it and come prepared to discuss topics.
5. If a member cannot attend a meeting, encourage him to send a substitute from his organization. Many new, good members have been found this way.
6. The most important aspect of advisory committees is getting interested, dedicated members.
   A. Don't hesitate to select busy people in key positions in the industry.
   B. Select members for their sincere belief in technical education in agriculture, for their first hand experience, and for their sense of responsibility and civic mindedness.
   C. Evaluate all advisory members once a year.
      1) Replace those who have moved or for other reasons have difficulty participating. Usually do this as their three-year terms expire.
      2) Reappoint good members.
      3) In some cases, move programmatic advisory members to the Overall Advisory Committee.
      4) Evaluation at UMW has revealed one committee member who has not missed a meeting of his advisory committee in ten years.

While the primary purpose of the advisory committees is serious, an attempt is made to develop rapport and have lighter moments. For example, one picture of the committee members in bib overalls was taken to tie in with the "overall" concept. Another year a picture was taken in UMW baseball caps. Each year the August meeting of the Overall Advisory Committee includes a steak fry at the Provost's residence with advisory committee spouses, community people, and several faculty and staff and spouses invited.

Members of UMW advisory committees are from varied backgrounds and areas of interest. They have had first hand experience in their specific phases of agriculture. They provide great assistance by evaluating programs, by making recommendations for improvements, and by verifying educational needs.

The advisory committees have provided valuable assistance in identifying employers who are willing to provide employment experience for students in the college's PreOccupational Preparation Program. They have also been very helpful in the recruitment of students and the placement of graduates.

Experience at the University of Minnesota Technical College, Waseca, has shown that procedures and relationships are important in developing successful advisory committees or councils.

Computerized Planning of Forage Systems as a Teaching Tool

Gerry L. Posler,
Ralph Munyan,
and Orlan Buller[1]

The senior author has taught courses in forage management and utilization more than 10 years. A valuable part of the courses has been the use of assigned problems whereby students develop skills in planning year-round forage systems for livestock. The problems have primarily emphasized development of systems for beef cow-calf operations, but some students have planned for dairy cattle herds or ewe-lamb flocks.

To eliminate many time-consuming calculations, a PL/1 computer program has been developed which greatly facilitates the planning and development of forage systems. It is called the Forage Management and Utilization Program (FMUP). The program, using information inputted by the students describing a beef-cow herd and a list of forages planned for utilization, develops tables of animal needs and available forage supplies. By comparing the needs and supplies, the FMUP also determines surpluses or deficits of forage on monthly and yearly bases.

Input Data

Cattle requirements. Beef cattle requirements used in the FMUP are adapted from those prepared by the National Academy of Science (1976). Requirements are converted to an animal-unit-month (AUM) basis, where 1 AUM equals the forage required for a 1000-pound cow for 1 month (approximately 20 pounds of dry matter/day). The student enters the number of cows and specifies the month of calving, calf crop percentage (herd basis), and the age in months (7-12) when calves will be sold.

Calves kept to an age exceeding 12 months must be reentered to assign their requirements. The number of replacement heifers needed to replace the cows that do not calve (100 minus calf-crop percentage) are automatically retained from each calf crop to calve at two years of age. A larger number of replacements beyond this minimum may also be specified by students. The desired number of bulls are inputted with an estimated mean weight. Inputs for yearling steers and yearling heifers include number, weight, month bought, and month sold. The yearling steers and heifers include any purchased and/or those raised in the cow-calf enterprise. The month "bought" for those raised corresponds to the month weaned and merely represents a transfer from calves to yearlings.

Available forages. Forages available for utilization during the year are chosen by the student and each is entered by a code number along with appropriate acreage information and a productivity rating of low, medium, or high. Estimates of the percentage of forage produced during each month and of annual forage yield of 15 forages have been developed from research data obtained in Kansas and adjoining states. Types of pastures included are cool-season grasses, native range, legume-grass mixtures, summer annuals (sudangrass and pearl millet), winter annuals (wheat), irrigated pasture, and crop residues (grain sorghum stover and corn stalks). Characteristics and optimum management techniques for each of these pastures are discussed in lecture, and students select pastures appropriate to the area of Kansas for which they wish to design their forage system.

Output Information

The FMUP outputs two tables of information for the students. In the first table, livestock needs (AUM basis) are presented for each class of beef animals (rows) for each month (columns). Total monthly needs for all livestock are shown and the total annual forage need for all livestock is presented. In the second table, amounts of available forages are shown for each selected pasture (rows) for each month (columns). Below the second table the difference between livestock needs and available forages (surpluses and deficits) is presented for each month and for the year.

Students examine the output data of the FMUP to determine strengths and weaknesses in their year-round forage plan. Adjustments then can be made and the program rerun to better fit forages to their livestock needs or to better match livestock needs to available forages. Students readily discuss merits and problems of their proposed systems with their instructor and with one another. Student feedback in the course evaluation has been positive, and several commented that the computerized problem was the most valuable part of the course.

There are several obvious advantages to using this PL/1 program as a teaching tool for planning forage systems. Students are relieved from many tiresome calculations, and calculation errors are eliminated. Students can then better utilize available study time to evaluate their plan, consider management alternatives, and make desired improvements to optimize their year-round forage systems. Students with a background primarily in agronomy, animal science, or agricultural economics better appreciate the interrelationships between these fields after planning a forage system. Several students, including some using the computer for the first time, commented that the problems were challenging

and exciting. The cost of running the FMUP is nominal, presently only 18 to 20 cents/student/run.

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Penn State's System for Student Recruitment at the Post High School Level

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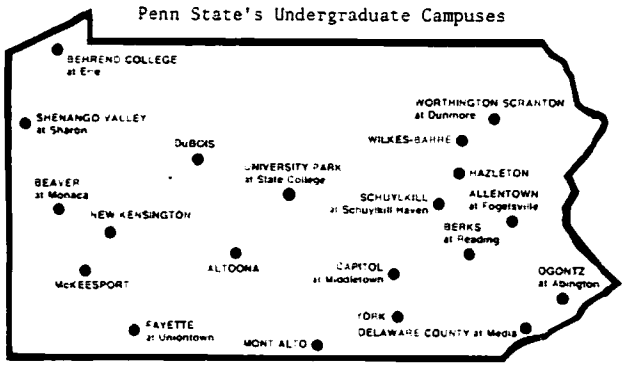
Background

Two-thirds of all baccalaureate freshmen begin in the small college environments of Penn State's 18 two-year Commonwealth Campuses or at Behrend College. Students at any Penn State campus receive the same Penn State education. Academic standards, University policies, and the contents of courses are consistent at all campuses. Students at any campus have access to books and materials from a single University-wide library system. After two years, students have the guaranteed option of moving to University Park.



Penn State's undergraduate multi-campus system enables students to begin studies at a location that suits their personal preferences. They can commute from a home or live on campus, choose a rural or an urban setting, study in a small college environment or that of a large campus.

There are, however, some definite disadvantages for agriculture majors. Until 1976-77, agricultural science and agricultural education baccalaureate degree courses were not available on the Commonwealth Campuses. More than 60 percent of all agriculture students were spending two years (6 terms) on Commonwealth Campuses in courses outside of their major. Some agriculture students became discouraged and dropped out of school. Others received poor advising from faculty members in the sciences and liberal arts.

Summary of Procedures

In an effort to improve this situation and with the aid of a project funded by the Pennsylvania Department of Education, an introductory course, Ag Ed 100v "Agricultural Education Orientation," was developed and offered on eleven different Commonwealth Campuses of The Pennsylvania State University. The purpose of this one-credit course is to examine the field of agricultural education and to aid students in exploring their aptitude and interest in teaching. Class activities included a field trip to a high school vocational agriculture program and a county-based cooperative extension program; discussions with state FFA officers, area vocational consultants, and cooperative extension service personnel; and making plans for meeting teaching certification requirements in agriculture. (See attached outline.)

Teachers of agriculture and cooperative extension agents in proximity to the campuses serve as course instructors. These instructors are master agricultural educators. All of the teachers had previously served as cooperating teachers for the Department of Agriculture Education. Instructors are employed two hours per week for a period of ten weeks to conduct instruction on their respective campuses. Classes are scheduled one period weekly late in the afternoon to accommodate the high school instructor. A College of Agriculture faculty member serves as a resource person and visits at least one class meeting of each section of the course.

One-day workshops are held annually for the course instructors. The purpose of the workshop is to develop plans for delivering the instruction on each of the Commonwealth Campuses. Resource materials are developed and/or selected for use in teaching the course and are made available in class quantity to the instructors.

Alpha Tau Alpha, the National Honorary Society in Agricultural Education, annually hosts Commonwealth Campus students for an open house weekend at University Park. The weekend is scheduled in conjunction with the Little International Livestock Exposition or the Dairy Exposition. University Park based agriculture students host the guests in their dormitories, fraternities, sororities, and apartments. A reception and a tour of the College farms and facilities are included in the schedule.

Summary of Results

Over the past five years more than 300 students, in 29 sections located on 11 different Commonwealth Campuses, successfully completed Ag. Ed 100v.

Eleven master agricultural educators have attended inservice workshops and are available to deliver future offerings of the course. Students and advisors on Commonwealth Campuses have a local resource person to contact for information about the College of Agriculture. Teachers of agriculture and county based extension personnel like the prestige associated with teaching a University level course on a University campus.

Average cost per section of the course for instructor's salary and travel has been $400.00. Instructors are paid $15.00 per hour, two hours per week. When the Commonwealth Campus is more than 10 miles from the instructor's home, the instructor is reimbursed for weekly travel to and from the campus.

More important however, enrollment in the preservice teacher education program at The Pennsylvania State University has increased 100 percent since 1976. A portion of this increase is the result of agriculture students' exposure to the opportunities in agricultural education through Ad Ed 100v on the Commonwealth Campuses. Included is a significant increase in dual major enrollments.

Future Plans

As a result of the success of these outreach course offerings in agricultural education, the Dean of Instruction in Penn State's College of Agriculture is initiating a broader based course. Ag 100 "Orientation," which will be offered on Commonwealth Campuses for the first time during Fall Term 1981. The model developed in agricultural education is being adopted by the College. This includes the following components: utilizing county based cooperative extension personnel and vocational agriculture teachers as course instructors, inservicing the instructors at an annual workshop, and utilizing a College of Agriculture faculty member as a resource person for each section of the course. We hope that in addition to providing a more direct line of communication between Commonwealth Campus students and the College of Agriculture, this effort will also have a positive effect on student enrollment in the College.

MINUTES OF THE FIRST NACTA EXECUTIVE COMMITTEE MEETING

27th Annual Conference, Baton Rouge, Louisiana
June 7, 1981

The meeting was called to order at 6:50 p.m. by President Stufflebeam in the Faculty Club of Louisiana State University. An Agenda prepared by the President was approved by the committee. A copy is attached.

Executive committee members present were Stufflebeam, Shrode, Miller, Brown, Everly, Blackmon, Campbell, Griffin, Stanly, Leamer, and Irwin. Standing committee chairmen in attendance were Craig, Seif, Vorst, and Tom Burger. Visitors were O. J. Burger and Carl Schowengerdt.

The President reported that he had represented NACTA at the Annual Delta Tau Alpha Convention in March at Arkansas State University, and at the NACTA Judging Contest in April at Hays Kansas State University.

Vice President Miller welcomed Executive committee members to the Annual NACTA Conference. He discussed aspects of the program and arrangements made for tours and events. A copy of his report as accepted, is attached.

Secretary-Treasurer Brown presented the annual report of Membership. Total memberships increased from 891 in 1980, to 910 in 1981. A copy of the report as accepted is attached. Next, the Treasurer's report was given. The current cash balance is $5,865.58. Total assets of NACTA are $13,472.49. A copy of the Treasurer's report, as accepted, is attached.

The Secretary-Treasurer distributed copies of proposed amendments to the NACTA Constitution and By-Laws. A copy of the amendments, as discussed and agreed upon by the Executive committee are attached.

Immediate Past President Shrode, serving as Chairman of the Nominating committee, made his report. The slate of nominees for NACTA offices for 1981-1982, is attached.

The report of the Coordinator for Canada was given by Miller for Stelmaschuk. A copy is attached. The report was accepted.

The meeting then was recessed at 7:45 p.m. until June 8 at 8:25 p.m., when it was reconvened in the Agronomy-Forestry building.

The report of the Western Regional Director Post was presented by the Secretary-Treasurer. A copy of the report, as accepted, is attached. A motion was passed to shift Alaska from the Central to the Western Region of NACTA.

The report of the Central Regional Director Campbell was given by Central Regional Director-Elect Tom Burger. A copy of the report, as accepted, is attached.

A motion was passed to authorize State Coordinators, with the support of their Regional Directors, to appoint Associate State Coordinators on individual campuses within a state to assist in carrying out the goals of NACTA at the state level.

The report of the Eastern NACTA Region was given by Director Blackmon. A copy of his report, as accepted, is attached.

Southern Regional Director Griffin presented the report from his region. The report was accepted as given.

The President appointed the following NACTA members to an Auditing committee: Bob McGuire, Chairman; Grant Moody and Charles Chaney. Also, he appointed Ed Frederick, Chairman; Bob Sorensen; Lewis Holland; Sumner Griffin and John Campbell members of a Resolutions committee.

Editor of the **NACTA Journal** and Chairman of the Publications committee, Everly, presented the report for his committee. The **NACTA Journal** averaged 50 pages per issue for the past 4 issues and was published well within the budget approved for the fiscal year. The Book Review Board report was given by Tom Burger. A copy of the report, as given and approved, is attached. The Media Review Board report was presented by Vorst. A copy of his report, as approved, is attached.

The report of the Teacher Recognition and Evaluation committee was given by Seif. He reported that AVI Publishing Company will provide $300 each year toward a NACTA Teaching award. The money will be used to fund the Western Regional award this year. The report was accepted.

The Historian Stanly indicated that no report was necessary from the Historian at the present time.

The Delta Tau Alpha Liaison committee report was given by Chairman Irwin. A copy of his report, as accepted, is attached.

The report of the E.B. Knight **NACTA Journal** Award committee was presented by its Chairman, Craig. A copy of his report, as accepted, is attached.

After discussion, a motion was passed to establish an Ad Hoc committee on Awards. The committee is to be appointed by the President and will be charged with developing possible teaching awards to utilize monies that might become available from prospective donors.

A motion was passed to increase the honorarium of the Assistant **NACTA Journal** Editor from $150.00, to $250.00 per year.

Action on the NACTA Judging contest was deferred until the Fall Executive committee meeting.

The meeting was adjourned at 10:15 p.m.

Murray A. Brown
NACTA Secretary-Treasurer

1980-81 EXECUTIVE COMMITTEE OF NACTA
June 7-8, 1981, Baton Rouge, Louisiana
Preliminary Agenda

1. Approval of the agenda
2. Approval of the minutes of the October Executive Committee meeting
3. President's report - Stufflebeam
4. Report from the Vice-President and Program Committee - Miller
5. Report of the Secretary-Treasurer - Brown
6. Reports from Regional Directors and Coordinator for Canada:
   - Canada - Stelmaschuk
   - Central - Campbell
   - Eastern - Blackmon
   - Southern - Griffin
   - Western - Post
7. Report from the Editor and Publications Committee - Everly
8. Report from the Historian