

NACTA Area/State Affiliate Panel Discussion

Compiled by Harley W. Foutch

The panel discussion focused on the establishment and development of area/state affiliates. Five states (Kansas, Missouri, Louisiana, Minnesota, and Tennessee) have established state affiliates. Oklahoma was accepted as a NACTA affiliate at the 1994 NACTA Business Session.

In 1993, the NACTA constitution was amended to provide for the establishment of area affiliates. It appeared logical that there were areas of the country crossing state/province lines in which groups of universities and colleges with programs in agriculture could join together to form a NACTA area affiliate more readily than those institutions geographically isolated within a state/province. An ad hoc committee of Harley W. Foutch, Chair, (Middle Tennessee State University), Doug Goodale, (Cobleskill University of New York), and Rick Parker (University of Southern Idaho) were appointed by President Pals in 1993 to investigate the feasibility of forming Regional NACTA affiliates.

Rick Parker discussed efforts in establishing a regional NACTA affiliate in Southern Idaho and Northern Utah and Doug Goodale reported on progress in the development of a Northeastern U.S. Regional Affiliate.

Establishing a Regional NACTA Affiliate in Southern Idaho and Northern Utah

Distances and numbers prevent the establishment of a NACTA affiliate in many states. In the western region, we are attempting to establish an affiliate that crosses state boundaries. The center of this affiliate is the College of Southern Idaho in Twin Falls. Within a 250-mile radius of Twin Falls, about 120 teachers of agriculture work at five institutions—College of Southern Idaho, Ricks College, University of Idaho (Regional office), Brigham Young University and Utah State University. Agricultural instructors from these institutions already work together on student transfers, tech prep, applied research and complementary programs. With the distances in the West and the sparse population, this affiliate could also include Oregon and Washington.

A survey of agricultural instructors at the five institutions indicated a strong support for the establishment of an affiliate. The first meeting of the Southern Idaho, Northern Utah affiliate (SNACTA) will be held September 23, 1994. At this meeting, the affiliate will be officially organized with a constitution and by-laws and the election of officers.

SNACTA will provide members with a quarterly newsletter, annual meeting and networking. The mission of this affiliate will be the improvement of agricultural teaching

through the use of technology. If only 20 percent of the SNACTA members join NACTA, this will be a real boost to the western membership.

Northeast Regional Affiliate Survey Results

A Regional Affiliate Interest Survey was mailed to 92 different colleges and universities throughout the northeast that are offering some form of agricultural education. The primary objective of the survey was to determine recipient perceptions of the need for regionalizing NACTA. Secondly, the survey was to ascertain levels of familiarity with the goals of NACTA. Twenty surveys (21.7%) were returned.

Although the return rate was lower than desired, the results were a pleasant surprise with 18 respondents indicating they felt there was "Value in establishing a NACTA Regional Affiliate." Granted, a few of the respondents were from the State Education Department. The majority of positive returns came from colleges and universities that are not regular participants in NACTA. Only half of the positive responses were aware of the goals of NACTA.

Positive response reflecting an interest in further conversations concerning regional affiliates came from two distinct geographic groupings. One group included Maryland, Virginia and West Virginia. New York, New Jersey, Connecticut, Massachusetts, Vermont and New Hampshire comprise the other.

Plans are presently being activated by Ed Yoder, Eastern Region Director and Doug Goodale, Northeast Regional Affiliate Ad Hoc Committee Chair, to draft an appropriate NACTA Regional Affiliate Constitution for review by the interested survey responders. A preliminary meeting of each of the two groups is being discussed for early fall.

Three of the panelists discussed aspects of established state affiliates. Gerry Posler (Kansas), Harry Pry (Missouri), and Omri Rawlins (Tennessee) reported on items, such as, history, establishment, structure, and programs of state affiliates.

Kansas Affiliate

The Kansas Association of Colleges and Teachers of Agriculture (KACTA) was founded in 1983 during the NACTA conference held at Kansas State University. There were 26 charter members of KACTA from 10 institutions, three four-year (two public and one private) and seven two-year colleges. Current KACTA membership ranges between 40 and 50 from 13 institutions. The officers of KACTA include President, Vice President, Secretary-Treasurer, NACTA State Coordinator, two Directors, and Past-President. These seven individuals compose the Executive Committee. The goal is to maintain a balance of officers among two-year and four-year institutions. The current President of KACTA is Dr. Al Dutrow from McPherson College.

KACTA activities include an annual meeting that is rotated among member institutions, alternating between a two-year and a four-year institution. Annual meetings are similar to NACTA conferences, with idea sharing sessions, posters, discussion topics highlighting host school programs, and other items. On some occasions, meetings are scheduled to allow members to participate in an athletic event. An annual newsletter is mailed to all members. The newsletter contains the minutes of the previous annual meeting, teaching philosophy of NACTA award winners, institution updates, a membership list showing current dues status, and other features.

During 1994, KACTA provided a one year complimentary membership to each of the twelve new teaching faculty in agriculture at two-year and four-year institutions in Kansas. We also provided a copy of the NACTA Teaching Tips brochure and a copy of a recent NACTA journal. Our goal is to encourage these new faculty to become active participants in both KACTA and NACTA.

I believe the success of KACTA has resulted from the strong support from administrators in agricultural academic programs in Kansas, particularly the Director of Academic Programs at Kansas State University, the Head of the Agriculture program at Cloud County Community College, and the Head of the Department of Agriculture at Ft. Hays State University. KACTA has also provided an excellent vehicle for college teachers of agriculture to become better acquainted with one another and facilitated the coordination of agriculture programs in Kansas.

Missouri Affiliate

Dr. G. Carl Schowengerdt, Southeast Missouri State University and Dr. Glenn E. Karls, Southwest Missouri State University, provided the leadership to organize Missouri post-secondary agriculture teachers in the mid-fifties. The original purpose was to facilitate the transfer of credit in agriculture courses among the colleges and universities of Missouri.

The current purposes as listed in the constitution are as follows: Purposes:

This organization shall be dedicated to the improvement of the educational climate of students of agriculture at colleges and universities in the state of Missouri. The purposes shall be to:

1. encourage and promote the improvement of instruction in agriculture and of research promoting such instruction.
2. promote the free exchange of ideas and information among teachers of agriculture at the post-secondary level and to provide a forum for such exchanges.
3. facilitate the transfer of credit in agriculture courses among the colleges and universities of Missouri.

4. encourage and promote membership and activity in the National Association of Colleges and Teachers of Agriculture.

The 1993 meeting report follows to illustrate a typical summary of the annual meeting.

MACTA, the Missouri Association of Colleges and Teachers of Agriculture, held its annual meeting July 15-16, 1993. The conference was hosted by Lincoln University of Jefferson City, MO. The opening session included a welcome from the Vice President of Academic Affairs-Lincoln, business meeting, Institutional reports from colleges represented, and a report on the 1993 NACTA Conference held in Twin Falls, ID. Afternoon tours included the Geographic Information Systems (GIS) project, research facilities, and the university farms.

The second day featured a report from the Missouri Articulation Committee, GIS undergraduate education, and a presentation by the Director of MO Department of Agriculture. The meeting was concluded with the election of officers.

Tennessee Affiliate

In the summer of 1979 the Tennessee Higher Education Commission reviewed all university agricultural programs in Tennessee. This review initiated the Tennessee Council of Agricultural Deans made up of the administrative heads of all major agricultural programs in Tennessee. In 1980 the council was formed and has met annually since the first meeting in 1981.

In 1985 the council decided that a similar organization of university agriculture educators should be formed. A state-wide Instructional Planning Committee was appointed to study how this might be accomplished. This committee proposed the formation of a state affiliate of NACTA known as TACTA be formed and in 1986 the TACTA constitution was approved. The first TACTA conference was held in 1988 at Middle Tennessee State University with about forty people attending.

TACTA meets on an annual basis and rotates the meeting places to coincide with the location of the current president. Topics of past programs include International Agriculture, Diversity in Agriculture, Critical Thinking, Agricultural Recruiting, and Environmental Agriculture.

NACTA encourages the organization and development of affiliates. Affiliates provide an excellent opportunity for college teachers of agriculture to exchange ideas and enhance the coordination of agriculture programs in a state or area. Please feel free to contact Harley W. Foutch, Chairman, Department of Agribusiness and Agriscience, Middle Tennessee State University, Murfreesboro, TN, 37132, for additional information on NACTA affiliates.

Don't Dare Change the Curriculum . . . Unless

Some fundamental questions about curriculum, its relevance, and its value as preparation for life long learning are being asked with increasing frequency at Colleges of Agriculture. New approaches including problem based learning, and the integration of practical work and/or international experiences with academics, are being considered in many areas of study in agricultural science.

A curriculum development approach recently undertaken in the four year degree program in agricultural science at the University of Guelph addressed these issues. The process began with a recognition, grudgingly by some and embraced by others, that although graduates were technically competent they were deficient in personal skills, communication skills, problem solving abilities, and conflict management skills.

Some basic tenants upon which the curriculum review process was developed and an outline of the process will be presented for the consideration of those engaged in curriculum development activities. Planning and managing the process can have a significant impact on the results.

"VISION 95"

An integrated curriculum for professionals in the agrifood system

Courses associated primarily with the B.Sc.(Agr.) program will be discontinued when the present curriculum is replaced by a newly designed and integrated program commencing in September 1995. Faculty have undertaken a major task in totally restructuring the courses and the curriculum leading to the B.Sc. (Agr.) degree.

The new curriculum will:

- be based on the learning objectives of the University of Guelph
- provide graduates with appropriate technical competence
- include personal skill development objectives for students in communications, problem solving, leadership, etc. that equip graduates to manage change.
- encourage students to be life-long, self directed, learners
- recognize a comprehensive learning environment that values the contributions of academic activity, practical work experience, and personal development in providing competent graduates.
- recognize non formal activity/experience for academic credit
- include cooperative group learning activities for students
- include courses that are multi-disciplinary and integrate the teaching of individual faculty and departments

- require students to obtain relevant work experience in externship or co-op programs and encourage them to participate in international study and/or work experiences
- provide students with exposure to professional issues and ethics
- be available in alternate delivery systems such as independent study
- commence with year one in September 1995

*G. M. Jenkinson
University of Guelph
Guelph, Ontario Canada N1G 2W1*

Strategies for Meeting Computer Proficiency

Abstract

Graduates from colleges of agriculture must have competence in the use of computers. Educators and industry personnel agree that computer proficiency is essential. How are colleges of agriculture meeting the computer education needs of their B.S. graduates? The objective of this study was to determine strategies for meeting computer proficiency in colleges of agriculture.

A written survey was designed and mailed to deans of academic programs in schools and colleges of agriculture throughout the nation. Eighty-three percent of the 71 deans of academic programs responded.

Slightly less than half of the respondents indicated their college had a computer education requirement. However, many additional departments did have a requirement of their own. The typical requirement was three credits of computer education offered as a single course. There were a few variations from this requirement including a test-out or computer proficiency demonstration.

Nearly three-fourths of the colleges of agriculture were providers of computer instruction. This was followed by the colleges of arts and sciences. Agricultural engineering and agricultural economics/business were the primary departments in colleges of agriculture providing instruction. departments of computer science were the primary providers in the colleges of arts and sciences. The vast majority of courses were offered at the freshman or sophomore level. Word processing, spreadsheets, and databases were instructional units most frequently taught. These units were followed by agricultural applications, graphics and the use of networks.

The typical teaching format was two hours per week of lecture and two hours per week of scheduled lab. IBM/IBM-

compatible computers were used by nearly all users. Slightly more than fifty percent also used Macintosh computers.

The respondents were asked to describe future changes in computer requirements they see for B.S. students in agriculture. Several felt that less time will be spent on basic skill development and more emphasis on computers integrated into the curriculum. Future uses for computers in classes included multimedia presentations, database applications, networking, GIS, CD-ROM, and CAD.

V.A. Bekkum
Associate Professor
Department of Agricultural and Biosystems Engineering
Iowa State University, Ames, IA 50011

W. Wade Miller
Professor
Department of Agricultural Education and Studies
Iowa State University, Ames, IA 50011.

Improving Landscape Design Education Through Computer Visualization

The ability to visualize unbuilt landscapes is paramount to successful landscape design. Much effort is directed toward educating students about principles and processes of design, but considerably less is done to develop their ability to visualize spaces, textures, forms, and compositions. Constructing scale models is useful, but is both time-consuming and costly. Students typically must rely on their own personal experiences and often do not acquire good visualization skills until they have seen a number of their own designs constructed. Computer-aided-design facilitates visualization through creation of 3D images that can be studied from many different viewpoints. Spatial qualities, scale, and form relationships are more easily understood when viewed in a true perspective. Alternative designs can also be studied and compared, often with a composite of alternatives leading to the final solution. Video imaging presents another opportunity for visualization, with manipulation of existing site photographs, resulting in an image showing proposed changes in planting and other amenities. The value of a video imaging system is dependent upon the depth and breadth of the library of plant and other symbols that are available for placement in the original scene. Video imaging viewpoints are limited to the that of the original photograph.

Dan T. Stearns, Shirley M. Gryczuk,
and Timothy L. Smith
Department of Horticulture
Pennsylvania State University
University Park, PA 16802

Using Journal Articles to Integrate Critical Thinking With Computer and Writing Skills

Developing critical thinking in the classroom is a necessary but sometimes difficult goal to accomplish. One approach that has been quite successful in both upper (junior and senior) and lower (freshmen and sophomore) division undergraduate courses is the use of a "critical review." From an identified subject area, students are asked to select a refereed journal article published within the last five years and review it. Since agriculture is continually changing and evolving it is important to expose students to where these new ideas come from and how the information is disseminated. Depending upon the level (upper or lower division) and a student's interest (applied or basic research), certain journals will be more appropriate. A list of journals is provided and students are asked to clear journal selections before reviewing them. In the critical review, students are required to identify the objectives of the research, explain the materials and methods, summarize results and discussion, and give their opinion on the value of the research either to them personally or to agriculture as a whole. The critical review should reflect an understanding of the experiment and therefore students are required to use their own words and not those of the author(s). For many students this is their first exposure to scientific research so instructions on what to evaluate is given as well as how the critical review will be graded is provided. The grade sheet allows students to focus on what is considered important and yet be complete in their review. Students have access to computer laboratories on campus and are required to submit the review in a printed format. Good writing skills are also emphasized by evaluating students on punctuation, spelling and grammar. Being able to effectively communicate ideas in a written form is essential to the success of college graduates.

Jean A. Gleichsner
Fort Hays State University
Hays, KS 67601

How to Make Test-Taking a Learning Experience

Contrary to popular belief, the process of taking a test is not always a learning experience. Professors often don't review completed exams with the class. Also, students take final exams and then leave for home. They don't know what they missed and may think they grasp a concept when they don't.

A simple modification of the test-taking process can make it a genuine learning experience. Prepare the exam in the normal manner but place three blank lines beside each objective-type question.

- Each student takes the exam and places his or her answer on the first blank beside each question.
- As students finish the exam they pair up and retake the exam as a team. They confer quietly and the team answer is placed on the second line beside the question.
- After all teams are finished with the test, the class reconvenes and takes the exam as a whole. If there are differences in team answers, a class discussion ensues until there is agreement as to the correct answer. The class answer is placed on the third line beside each question. The instructor then announces the correct answer.

Each question on the test counts six points. The answer on the first line (individual answer) is worth three points. The answer on the second line (team answer) is worth two points. The answer on the third line (class answer) is worth one point.

The student reaction to this mode of testing has been overwhelmingly positive. The benefits of this testing technique include:

- Students actually learn information while taking the test.
- Students know what they have mastered and areas in which they need work.
- Professor-student conflicts are reduced because students debate among themselves.
- The professor can evaluate the effectiveness of his/her teaching by listening to the class discussion of a question.

*Gary E. Moore and James Flowers
North Carolina State University
Raleigh, NC 27695-7801*

Experiential Approach For Teaching Equine Management and Production

With the large numbers of agriculture students coming from urban backgrounds, it has become even more important to include hands-on, live animal laboratory exercises in order to provide these students with the knowledge and capability to use their scientific education after graduation. Additionally, it is well-documented that students who are active participants in the learning process are more likely to comprehend and retain information and skills than those who are passive. The focus in the equine curriculum has been to encourage active learning by requiring students to participate in the various aspects of horse farm management and production similar to what they would experience in the industry.

Students in the equine courses are exposed to hands-on learning through activities such as pre- and post-natal care of mare and foal, foaling, initial training of foals, daily grooming, health and hoof care, saddle-breaking, and sale preparation of young horses. Their involvement in these activities is prefaced with a classroom introduction to the concepts and rationale behind the procedures. Students are supervised during the activities, and although allowed to make decisions regarding the situation, they are continually reinforced both by the consequences of their decisions and by the instructor. This approach provides the students the opportunity to draw from their classroom training and use that knowledge in the actual situation. Since they are working with live animals that will give a variety of responses, the students learn to quickly recognize, evaluate and solve specific problems.

As evidenced by student comments regarding the hands-on approach used in the equine management and production courses, the students gain invaluable training that complements the theoretical and factual information presented in a typical classroom situation. The degree of learning in these classes is enhanced due to the active involvement of students. The end result is that the students are better prepared for careers in the horse industry because they have already had the opportunity to put themselves to the test in the real situation. Another plus for the experiential approach used in these courses is that it builds student confidence which carries over into many of their other academic endeavors.

*Martha M. Vogelsang, Charlie Apter and Anita Lang
College of Agriculture and Life Sciences
Texas A & M University*

Video-technology and Student Journals Enhance Learning in Equine Science Laboratories

Video-technology is now easy and affordable. Along with journal writing, it can provide prompt feedback to students. Hands-on laboratory sessions are excellent teaching formats that involve multiple sensory learning modalities (visual, auditory and tactile). Videotaping facilitates learning by showing the association between students' actions and the consequences of those actions, and by providing teacher commentary and opportunities for observation and imitation of others. The journal format requires students to consider what has occurred and organize it into a written form.

Each student in an Equine Training and Management Laboratory was assigned a horse to train during a four-month semester. The class met five days each week for approximately two hours per day. Each week, some sessions were videotaped for viewing at the beginning of the next week. At that time, the teacher and the students discussed problem solving, training techniques and horses' responses to student cues. Videotapes were also available for students' use at home. Students were also required to write a journal that included written objectives for each training session, and then written results and future goals after each session. These were critiqued by the teacher once per week. In this way, the journals provided practice in planning, monitoring and adjusting teaching methods and critical thinking. They also provided additional communication with the instructor, and could be repeatedly consulted. They required students to develop the habit of planning ahead and working toward stated goals in a systematic manner.

Students said that videotaping altered their perception of the cue-response-reinforcement method that is used to train horses. They reported that their ability to plan, teach, think critically and organize their thoughts had been enhanced by the journal writing process. From the teacher's perspective, an optimal learning environment was provided where students were able to practice and improve their higher learning skills.

*Judith A. Reynolds, Gary D. Potter
and Martha M. Vogelsang
College of Agriculture and Life Sciences
Texas A & M University*

Development and Implementation of Standardized Software for FFA Judging Contests: A Cooperative Effort in Texas

Abstract

Colleges and Universities with agriculture programs often serve as host for FFA and 4H judging contests. This relationship has proven to be mutually beneficial for both parties. The youth organizations depend on the universities to provide a variety of resources; 1) University farms and facilities are used to accommodate the contests, 2) University faculty to set up and conduct contests which are within their respective areas of expertise, 3) University students to assist in various aspects of the contests with the largest number involved in grading and tabulation. In turn, universities have found contests to be a very effective recruiting tool. Surveys have shown that a significant number of students, who participate in an FFA or 4H judging contest at a particular university, choose to enroll in the same institution.

In 1994 more than 20,000 contestants participated in invitational, area, and State FFA and 4H judging contests hosted by the thirteen member institutions of the Agriculture Consortium of Texas (TAC). Competition is available in the following contests:

Agricultural Mechanics	Horse Judging
Agricultural Sales	Livestock Judging
Dairy Cattle Judging	Meats Judging
Dairy Foods	Poultry Judging
Farm Business Management	Land Judging
Horticulture	Range and Pasture Judging

Grading and tabulation of each contest entails a massive amount of "paper work" which must be completed in a relatively short period of time. Typically, contests are conducted in the morning and results are announced in a mid afternoon ceremony the same day. In recent years, the number of judging events and the number of high school participants has increased while the number of college students available to assist with the contests has remained constant or declined. This has created a chronic problem of insufficient help which is most acute in the area of grading and tabulation.

Numerous attempts have been made over the years to computerize part or all of the grading and tabulation process. Some efforts have been moderately successful and some have

been outright disasters. Several problems have needed to be addressed in order to successfully computerize the grading and tabulation process. Foremost of these was the need for standardization.

Texas A&M University (TAMU) and Tarleton State University (TSU) have developed a comprehensive computerized scoring system for use in Texas FFA and 4H judging contests. The development and distribution costs for the project were largely funded by the Houston Livestock Show and Rodeo. The scoring system has been adopted by the thirteen member institutions of TAC. Minimum system requirements include; a National Computer Systems (NCS) optical scanner, Scan Tools software, IBM compatible 386 or 486 DOS based computer with 20 megabyte hard disc, printer, documentation, and Software Synergistics contest software.

This paper discusses logistical problems associated with computerized scoring and tabulation of judging contests, the development of the Texas system, a description of the system, and its implementation in Texas.

*Frank Ewell
Tarleton State University
Box T-1119, Stephenville TX 76402*

*Ted Ford
Tarleton State University
Box T-1119, Stephenville TX 76402*

*Joe Townsend
TAMU
109 Kleberg Center, College Station, TX 77843-2402*

*Gary Briers
TAMU
109 Scoates Hall, College Station, TX 77843-2402*

Placement Success of Wildlife and Fisheries Students from Texas A&M University, 1982-92

The wildlife and fisheries profession has a reputation for poor employment success. The most recent survey by The Wildlife Society (1985), indicated that approximately 30% of students with B.S. degrees were employed in the profession. Success rose to about 75% with M.S. degrees and 95% with Ph.D.s. In January, 1994, we mailed 872 surveys to students

who had received degrees from the Department of Wildlife and Fisheries Sciences at Texas A&M between 1982 and 1992. Only one survey was mailed with a follow up post card. We used the Former Students Association mailing list, but surveys were not sent to international addresses. The response rate was 39.5%. Of the respondents, 59% received only B.S. degrees from the department, 13% received a B.S. and a graduate degree, and 28% received some combination of graduate degrees from Texas A&M.

The average time after graduation to find the first job was 3.19 months (SD=4.82). For those with only B.S. degrees, the occupations immediately following graduation were military (4%), graduate school (23%), natural resources (36%), science/agriculture (21%), non-science (16%), and unemployed by choice (0.4%). For those receiving graduate degrees, occupations immediately following graduation were military (0%), graduate school (11%), natural resources (60%), science or agriculture (25%), non-science (4%) and unemployed by choice (0%). To enhance consistency of categorization, those employed in aquaculture were listed under natural resources, and high school or college science teachers were listed under science/agriculture. The types of employers immediately following graduation were state agencies (23%), federal agencies (17%), private industry (28%), academic institutions (24%), non-profit agencies (5%), and self-employed (3%).

Current occupations were listed as military (3%), graduate school (12%), natural resources (39%), science/agriculture (28%), non-science (11%), unemployed by choice (3%), unemployed but seeking (3%), and other (0.3%). Current employers were state agencies (24%), federal agencies (19%), private industry (24%), academic institutions (22%), non-profit agencies (4%), and self-employed (8%). For alumni with no graduate degree, the average current salary was \$ 25,543 (SD= 12,668). For those with at least one graduate degree from Texas A&M, the average was \$ 38,276 (SD= 10,896). For those with a Ph.D., the average was \$ 42,998 (SD=11,979).

Only 1.9% of respondents indicated they have not been able to use the general education (english, math, etc.) they received in college, and 16% indicated they have not been able to use the specialty education (wildlife, fisheries, aquaculture) they received. Underemployment, or working below one's educational abilities, was not measured in this survey. Realizing the limited nature of this survey, we suggest that the placement success in the wildlife/fisheries/aquaculture professions for graduates of this department exceeds 80%.

*Liz Marshall and Robert Brown
Texas A&M University
210 Nagle, College Station, TX 77843-2258*

Distance Education via Visual Teleconferencing System

A recent survey at the University of Illinois indicated 23% of the 1975 graduates had additional degrees and 79% had participated in some form of continuing education experience. The major limitations to continuing education are release time from work, travel considerations, and the physical location of course and program offerings. Distance education is increasingly important in overcoming these obstacles for interested students. A Visual Teleconferencing System (VTS) was used to offer a course entitled Soil Fertility and Fertilizers to twenty students at four locations in Illinois. VTS consists of connections via two phone lines; one for interactive audio and one for interactive computers. Class notes and digitized visuals are displayed on a screen with an electronic pen that allows highlighting, freehand drawing, as well as keyboard entry, and other forms of on-screen annotation. Writing via an electronic tablet is possible for both the instructor and the students and is viewed simultaneously at all locations. When in a VTS conference, all participants have the ability to share visuals, annotate them and discuss the images in real-time. The VTS technology requires a computer, modem, audio conferencing equipment, two standard phone lines, an electronic tablet, and appropriate software (scanner and printer are optional but useful) to successfully improve public access to the classroom. Its advantages include voice and visual aid interaction, multiple sites, moderate equipment costs, and reduced travel time for instructors and students. It lacks the real time "face to face" contact of classroom or fully interactive video but at a much reduced cost for transmission time, equipment, and support personnel required by the latter. Student ratings were 4.0 of a possible 5.0 for course delivery impact, 4.2/5.0 for course material quality, and 4.3/5.0 for course facilities and services satisfaction. The technology will be demonstrated and instructors course development experience discussed.

*W.L. Banwart, S. Hsu, F.E. Mastny, and J. Everly
Department of Agronomy
Office of Extramural Programs,
and Department of Agricultural Communication
and Extension Education
University of Illinois, Urbana IL 61801*

Employment Opportunities for College Graduates in the Catfish Industry

With today's ever-tightening budgets, universities are examining their needs for many degree offerings. Aquaculture programs may be particularly vulnerable due to small enrollments and the requirement for expensive facilities. To determine the need for college graduates in the catfish industry, we mailed 400 questionnaires to members of the Catfish Farmers of America. Seventy eight responses were returned from 51 fish farmers, 19 non-fish farmers (equipment and feed sales, processors, consultants), 8 universities and 4 financial/legal institutions. Ten fish farmers employed a total of 8 people with M.S. degrees and 2 with Ph.D.s. Sixteen employed 28 people with B.S. degrees, and 20 employed another 25 with some college but no degree. Forty two fish farmers had hired new employees in the past 2 years, but only 7 with B.S. degrees (salaries \$ 18,000-45,000) and none with graduate degrees. Sixty five percent planned to hire a total of 25 college graduates in the next 2 years. These producers represented 18% of the catfish pond acreage in the U.S. If this sample were representative of the industry, 139 college graduates would be hired on catfish farms in the next 2 years.

Of the 19 non-fish farmers, 18 employed 5 Ph.D.s, 11 with M.S. degrees, 29 with B.S. degrees and 15 with some college. Seven respondents had hired 11 with B.S. degrees in the past 2 years (salary range (\$18,000-26,000)). Seventy one percent said they would hire a total of 25 college graduates in the next 2 years. Of the 8 university respondents, 6 stated they employed a total of 6 Ph.D.s, 2 with B.S. degrees and 9 with some college. Five had hired college graduates in the past 2 years—1 Ph.D. (\$32,000), 2 with an M.S. (\$25,000), and 3 with B.S. degrees (\$ 15,000-22,000). Six intended to hire college graduates in the next 2 years—1 Ph.D., 4 M.S., 6 with B.S., and one D.V.M. Responses from banks/law firms were not analyzed.

There has been a trend of hiring proportionally more college graduates into affiliated industries and universities than onto fish farms. Fish farms hire large numbers of non-college graduates and seasonal workers, largely at minimum wage. There seems to be a continued need for college graduates in fisheries/aquaculture, but also in the associated disciplines of business, accounting, agricultural economics, agricultural engineering, marketing, and veterinary medicine. The survey also pointed to a need for vocational and continuing education programs in aquaculture for the many non-college educated employees of fish farmers.

*Robert D. Brown and Marty Brunson
Texas A&M University and Mississippi State University*