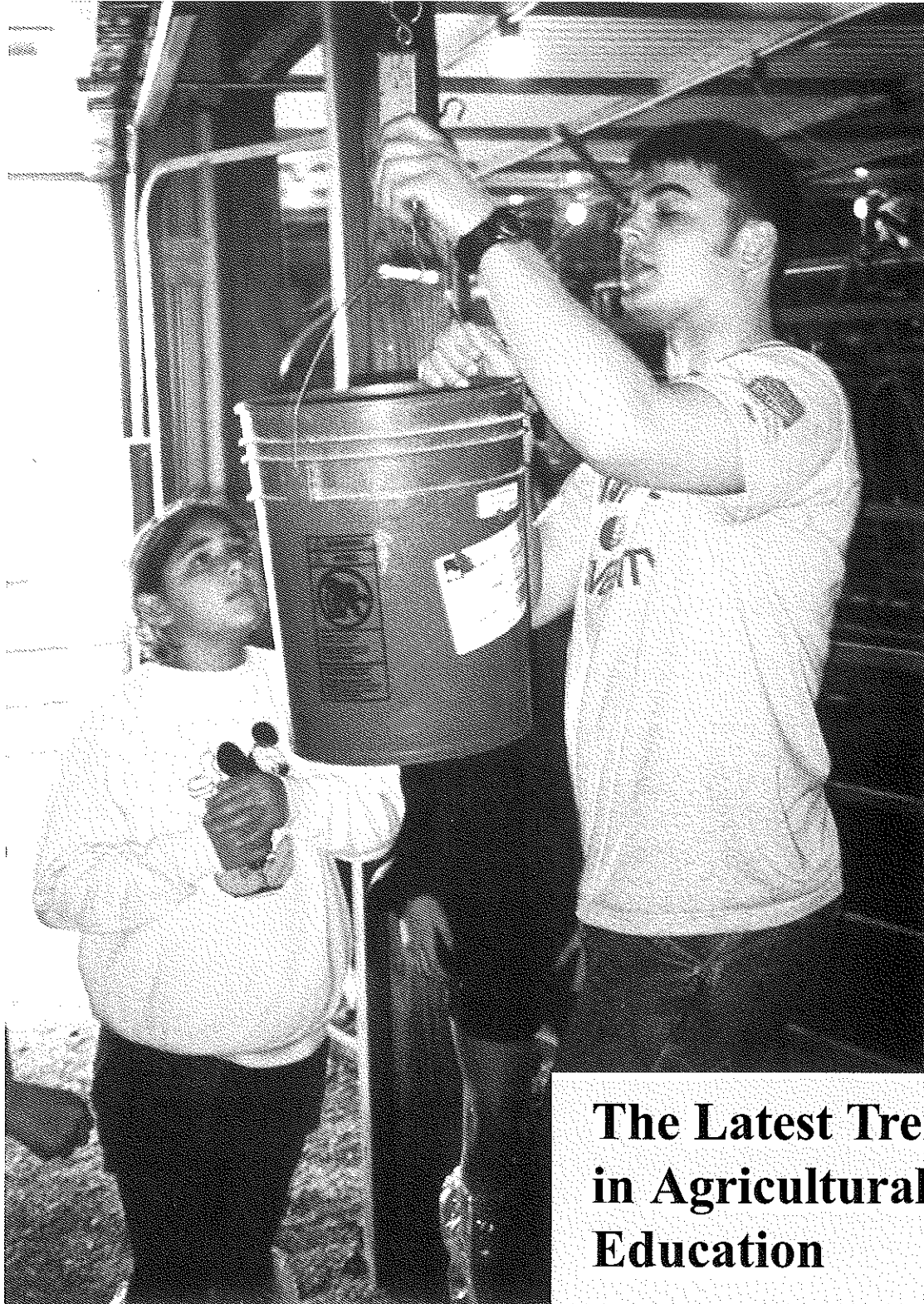


The Agricultural
EDUCATION

M A G A Z I N E

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issue 3*



**The Latest Trends
in Agricultural
Education**

Trends: On the Verge of Dramatic Change?

By Robert A. Martin

Winston Churchill once said that "it is a mistake to look too far ahead. Only one link in the chain of destiny can be handled at a time." However, Norman Vincent Peale once said that "we tend to get what we expect." (*Great Quotes*, 1990.) Trend analysis often causes some stress because we are put in the position to analyze the situation not knowing for sure the "staying power" of the phenomenon we think we are analyzing. Therefore, we approach trend analysis with some caution. Nonetheless, it is true that educators like to do this type of analysis because it is fun.

What then are the "trends" in Agricultural Education we should analyze? Do these trends have "staying power" and will they have significant impact on all aspects of the profession or are they fads or issues for temporary concern? What questions do these trends generate that need attention by the profession?

In recent discussions among agricultural educators, seven trends seem to come to the top of the list for intense study. You may have other ideas about some trends you would add to the list and you may dismiss the ones listed in this article. Nonetheless, these are critical issues that some educators see as trends needing our attention.

➤ **Change in dominant culture** – Our nation's population is becoming more diverse. How agricultural education adjusts to this diverse population may well determine its survival.

➤ **Urban program growth** – Agricultural Education in urban schools is not new, at least in a few notable situations. However, the real growth potential for agricultural education and FFA surely rests in

urban and suburban centers. The aggressive establishment of urban agriculture programs may be the most significant development for agricultural educators in the 21st century.

➤ **Curriculum expansion** – Some agricultural educators contend that the real staying power of the program can be attributed to the changes in the curriculum. The curriculum has changed to reflect new dimensions and career paths in agriculture. A dynamic industry requires a dynamic curriculum. Is our curriculum a dynamic living curriculum?

➤ **Curriculum integration** – In today's world, survival of any school curriculum emphasis is directly tied to how it relates to the basic reading, science and math foundations. Integration is a hot topic today. What are we doing to link our programs to student success in these critical basic learning domains?

➤ **Accountability for program impact** – There is hardly any known institution that has not come under intense scrutiny regarding program accountability. The key questions are what is the impact of the program, what changed because of this program and what difference does it make?

➤ **Program relevance** – Relevance is critical to accountability and impact. Does the current set of practices and procedures in Agricultural Education, FFA and SAE have meaning to current and potential stakeholders? Are we stuck on tradition or adjusting to meet relevant needs of stakeholders and learners?

➤ **Upgrading teacher education** – The key to learning is facilitation. Teachers are the ultimate facilitators. Are we preparing teachers in agricultural education in the best way or are we tied to an old model?

Obviously these and other trends could have profound impact on our programs especially if we take them seriously and get in front of the curve in shaping them. If we wait and react to them, it is too late. Although the trends identified here and in the several articles in this issue of *The Magazine* represent only a limited view of impending change, there is evidence that some things will never change. The bedrock principles upon which agricultural education operates are not going away:

- Experiential/Problem-based Education
- Career Exploration in and about Agriculture
- Knowledge and Skills in and about Agriculture
- Personal Growth and Leadership Development
- Teamwork/Cooperation and Citizenship

If we expect excellent results from programs based on our basic principles, the various trends that come along will be handled in the best way possible. There is more than a leap of faith in this statement. I am confident we can meet the challenges these trends present.

Special thanks goes to Dr. Tracy Hoover for her service as Theme Editor. The articles in this issue represent thoughtful ideas and practices for the profession. Thanks to all authors for their contributions to this issue. Enjoy!

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Authors writing for the November-December issue of *The Agricultural Education Magazine* look at new trends in agricultural education. Trends include instructional strategies, delivery systems, and techniques. (Photo courtesy of Stacie Turnbull, Iowa State University.)



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Making a Difference: Innovation in Agricultural Education

By Tracy S. Hoover

"There is a crucial distinction to be made between innovation and originality. The second, unlike the first, can never break with what preceded it: to be original, an artist must also belong to the tradition from which he departs. To put it another way, he must violate the expectations of his audience, but he must also, in countless ways, uphold and endorse them."

(R. Scruton, b.1944)

Several issues such as budget cuts, high-stakes testing, block scheduling, integration of academic standards and accountability are influencing and challenging agricultural educators at all levels and require different and innovative means of conducting business. Examples of instructional innovation can be

found throughout the country; many of which are included in this issue of *The Agricultural Education Magazine*. In this issue authors showcase interesting and contemporary instructional strategies, educational issues, delivery systems and ideas.

At the core of each article in this issue is evidence that we as agricultural educators are driven to make a difference in the lives of our students regardless of the challenge. This pervasive and deeply rooted belief gives us the strength, ability and creativity to develop, adapt, adopt and critically evaluate instructional strategies, techniques and curricula for our students and programs. Instructional innovation also includes creative and efficient approaches for integrating national and state standards into our programs. This transition to show how our curricula contribute to the achievement of youth in "academic" subjects. This initiative will require an innovative, coordinated and comprehensive

effort by the entire Agricultural Education family.

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Current issues in education are making it more important than ever for educators to be innovative in their instructional practices. A student at Iowa State University works to introduce elementary students to aspects of agricultural production during Cary Trexler's Service Learning class. (Photo courtesy of Stacie Turnbull, Iowa State University.)



New Trends in the Agriculture Curriculum

By Tony Boehm

There is no doubt that the agricultural industry has changed in the last 20 years, and Agricultural Education has followed suit. Our curriculum has adopted the scientific principles that have become common in production agriculture. In the early 1990's, the push was towards agri-science instruction. High school agriculture programs were building greenhouses and agri-science fairs were taking shape. We certainly have expanded the definition of agriculture to include many peripheral careers. Some say that we have lost touch with the foundation of our industry, livestock and crop production, while we implemented a new diverse curriculum. Yes, we cannot teach biotechnology without first teaching plant and animal reproduction, however, after we teach these foundation curriculum units, I say "Onward and Upward!"

A new unit of instruction that is gaining popularity is food science. This is not an attempt to displace the Family and Consumer Science teachers in our schools. Food science curriculum deals with food safety/microbiology, agricultural processing, and marketing. Every career that touches a meat product from production to the processing plant and onto packaging has its foundation in agriculture. We should collaborate with Family and Consumer Science teachers to make these units of instruction even better.

Many Agricultural Education programs have taught units in agricultural products for years. These units are outstanding and

should continue. However, food science topics can be added to your curriculum, and can be done so in a number of ways. A food science unit can stand alone, or these issues can be incorporated into your meats, dairy products, cereal grains, and fruit/vegetable units.

As a stand-alone unit, food science instruction should include food safety and pathogens that cause illnesses, processing techniques, marketing, sensory evaluation, product development, nutritional analysis, and consumer trends. If you wish to add these topics to your current meats, dairy foods, cereal grains, or fruit/vegetables units, add the lessons in safety, processing, and marketing that are specific to that particular agricultural product.

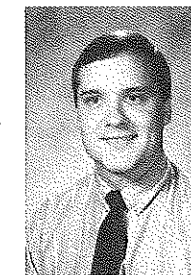
Lab activities in these units can be exciting and challenging. Maybe the best part of this unit is that we get to eat the products that we are developing! Have students develop their own jerky, sausage, ice cream, bread, or trail mix recipes. Then make the product, design marketing plans, packaging, nutritional labels and ingredient lists for the new product. Have students develop a Hazard Analysis and Critical Control Points program, or a HACCP program, for their company that would ensure the safety of their product. Have teachers, parents, or administrators serve as judges and select the new product they like the best. If time permits, have the students make a presentation to "pitch" their new product to the judges.

Sensory evaluation is another career skill. Students can study aroma identification. Difference, or triangulation, testing requires students to identify one of three samples of a

product that is significantly different. This activity allows students to see if they can identify the change, positive or negative, in a recipe or processing procedure. Complete lab activities in microbiology, such as molds, fungi, or yeasts, studying how they grow and how they are controlled. Do experiments in food preservation and how different techniques affect shelf life. There is no shortage of creative labs that you can develop.

Food science allows for the integration of math, science, marketing, and communication skills as students calculate nutritional labels, study microbiology, develop marketing plans, and deliver oral presentations or submit written reports. Work with other teachers in your school, developing cross-curricular partners, and build support and respect for your program. Furthermore, students will be creative, solve problems, and work within their team, and have a blast doing it.

Agriculture is a diverse and growing industry that provides food for the world. From livestock nutrition, to global positioning systems, to DNA extraction, agricultural instructors are asked to prepare students using a very diverse curriculum. We should introduce students to the diversity of careers that are required to feed the world.



Tony Boehm is an Agricultural Education Instructor at Richland Junior/Senior High in Colfax, ND.

Trends in Working with Special Needs Students

By Katie Cooper, Jennifer Bocksnick, and Martin Frick

Students with special needs often appear at the forefront of our public education system today. The push to involve all students in the regular classroom has brought about new dynamics of classroom procedures in order to be able to communicate effectively in the classroom. Agricultural education programs that develop a method of integration, that allows for the success of special needs individuals, will be prepared to assimilate these students smoothly and completely. By modifying methods in classwork, laboratory exercises, Supervised Agricultural Experience Programs, and FFA activities, developing innovations that facilitate meeting the requirements of special needs students are easily implemented.

Full integration of special needs students into the agriculture education classroom requires prior planning and preparation. There are many strategies available to make this transition as seamless as possible. Effective curriculum adaptations can be directed into four areas, including instructional strategies, instructional materials, curricular content, and assessment practices (Bashinski, 2002). It is important to realize that while all students may be in the same room, they are not all in the same place. When incorporating special needs students into any classroom, it is important to have those students participating at the same time as the mainstream students. This includes arriving at the same time, participating in classroom activities, and leaving the classroom together. These students should be seated so that the teacher and other students can interact with them easily while

they observe the entire classroom and participate in class activities. The same expectations in behavior and participation should be upheld with special needs students as with students without disadvantages. Special needs students should socialize with other students and have this socialization supported by their peers and instructors. These students should be expected to dress and behave in an age appropriate manner (SNOW, 2002). As adolescent students place such a high importance on outward appearance, setting this expectation will ease interactions between mainstream and special needs students.

Most strategies for integrating special needs students involve merely a reminder to treat those students as though they were not any different. Where this varies is in the case of curriculum. When developing curriculum, teachers work within the school, collaborating with psychologists and counselors to determine the most effective levels and types of learning required by specific students. However, there are some steps that can work universally in your agricultural education classrooms.

Special Needs Opportunity Windows (SNOW) is an organization that provides resources for teachers working with special needs students. This organization recommends several classroom modifications. Teachers should require students to spend specific time organizing their work. This is an area with which special needs students commonly struggle. By implementing a mandatory 2-3 minutes at the end of every class devoted to organization, all students will benefit. Providing study tools is also useful. Most special needs students simply do not have the capacity to sit down and study on their own. By providing a "study

buddy", creating flashcards, and teaching integrative study techniques during class that the students can use at home, teachers will see that their special needs students immediately improve. Specific methods that SNOW proposes include providing a sample chart to schedule home study time, having students evaluate their own use of time, teaching the RAP-study method: READ – ASK yourself what you read – PUT it in your own words, creating pre-lesson outlines to use as a study guide, using note cards for themes and ideas, and teaching mnemonic, or word game devices when possible to facilitate retention. SNOW suggests that organization will be increased by using a calendar or timetable, creating personal assignment records, developing task analysis sheets that break larger assignments or projects into smaller pieces, and teaching visualization so that students can "see" the final product before they start on the project (SNOW, 2002).

For full integration of special needs students into the agricultural education classroom, special needs students are required to participate in the same activities at the same times. While slight modification of an activity might be required, it should resemble the activity of mainstream students. Students should never feel that they are being held separate because of their disability. A large part of this socialization and learning process is providing an opportunity for special needs students to work with mainstream students. Children learn by example and unfortunately, in many cases there is not the support and education at home to make the learning experience for special needs students the best that it can be. By working with students their own age, special needs children can begin to develop the concepts,

behaviors and habits that will allow them to succeed in their life.

In a laboratory setting, the most pressing concern when dealing with all students is safety. When special needs students are involved, in some cases this concern should be heightened. Customized projects can be created to teach hands-on, real-life skills that will benefit all persons involved. In Edinburg, Texas, horticulture teacher Vilma Gomez offers special needs students a program that instills basic and horticulture specific skills to prepare all students for future employment (National FFA Organization, 2002). Diverse learning styles are addressed as the program is run as a simulated business, offering all students a niche in which to excel. Because of the specialized instruction, every student has the opportunity for hands-on experience and individualized assistance. This approach to learning boosts students' confidence in their ability to perform in the job market.

When moving from the classroom and laboratory to a Supervised Agricultural Experience (SAE) Program, the focus turns from instruction to application. SAE programs including livestock exhibition, horticulture, agricultural mechanics and job placement all have been proven to work well for students with special needs (Schwager & White, 1994). Only minor modifications in the amount of instructor/student interaction need to be made. In order to ensure success in these programs, record keeping skills, parental support and consideration of student ability and behavior must be addressed. Because each individual student can customize an SAE to their specific needs and interests, this facet of the agricultural education process can be an area where special needs students especially flourish. In Altus, Oklahoma, agricultural educator Bruce Farquhar has

worked with physically disabled students in order to ensure their success (Bridging New Horizons, 1996). Adaptations such as using private band radios to direct a blind student in the show ring and helping another student select and train a smaller breed of sheep to compensate for lack of physical strength demonstrate that small adjustments can be made to make the SAE a positive experience for all.

Similar to the SAE projects, the FFA offers many unique opportunities for special needs students. One area with which special needs students specifically struggle is self-esteem and independence. By encouraging these students to become part of the FFA, these obstacles become stepping-stones to a brighter future. Through FFA meetings and Career Development Events, agricultural education teachers can encourage all students to discover what their strengths are, rather than focusing on areas of disability. Each student will have an area that sparks his or her interest or in which he or she might be particularly interested. By encouraging this interest and pairing the student with another student who similarly excels, new bonds are made and learning is accomplished.

Specifically through the FFA, a mentoring program, PALS, has been developed that matches high school agriculture students with elementary youngsters who have special needs. PALS, allows those involved to build trust in others and develop positive self-esteem. Social skills are addressed and improved through the interaction of the different age and experience groups. The main objective of this program is to follow the Strategic Plan for Agricultural Education, the mission of which is to provide a total, dynamic educational system that contributes to personal, academic and career development (National FFA Organization, 2002).

As an agricultural education specialist, it is most important to remember that your attitude is critical to success. Many of these special needs students have simply never heard, "You can do it." Many times it is not the adaptations that matter the most, but simply the support and positive influence that a fully integrated agricultural education program can provide.

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History Plays a Major Role in Today's Advancement in Agricultural Education

By Andrew J. Baker

I consider myself blessed by having the opportunity to teach secondary agricultural education in a state that possessed state-sponsored instructional materials for agricultural educators. During my tenure as a secondary teacher, I also had the pleasure of being visited twice a year by my district field supervisor. My district supervisor and I spent many hours making sure state paperwork was completed on time and to make sure my program was meeting the expectations of the state. If you haven't guessed by now, I spent several years teaching high school agriculture in Missouri. Agricultural Education in Missouri has held on to the traditional organizational structure of district field supervisors and developing state-sponsored curriculum for teachers.

While going through graduate school at the University of Missouri, I had the opportunity to become a technical writer for instructional materials utilized by Missouri agriculture teachers. I also had the opportunity to write instructional materials for the National Council for Agricultural Education. Through these experiences, I firmly believe that curriculum drives what we teach and how we teach agriculture subject matter.

Fifty years ago the development of instructional materials was fairly simplistic. There were four major courses offered in Agricultural Education (Ag 1, Ag 2, Ag 3, Ag 4). Today, the

agriculture curriculum has become much more complex! Therefore, the training of pre-service teachers has become more complex to meet the individual needs of a particular school district. Currently, I am a teacher-educator in the state of Illinois. Illinois is a very challenging state, because of the vast array of agricultural education programs that exist. The question resides in, "How do you train pre-service teachers for an agriculture program that exists in downtown Chicago versus a rural school graduating 25 students a year?"

History answers that question for me. Fifty years ago, most states had established the traditional supervision structure of providing state field personnel within certain districts. There was also a plethora of instructional materials from which to guide

classroom instruction. What attracted me to the state of Illinois, several years ago, was the leadership foresight in Agricultural Education. Fifteen years ago, the state of Illinois was at the bottom of the barrel for classroom enrollment and FFA membership.

To try to stop the massive hemorrhaging of classroom enrollment and FFA membership, state leadership developed a group called the Illinois Leadership Council for Agricultural Education (ILCAE). This group of 30 individuals, comprised of mostly agribusiness personnel, came together to develop the existing leadership structure established in Illinois today. These individuals believed that Agricultural Education was important enough to save. The main purpose of the organization was to lobby in support for Agricultural Education at the state



Training pre-service teachers for a variety of agricultural education environments is a challenge. Baker encourages states to focus efforts on providing sufficient funding, support, and curriculum development for agricultural education programs. (Photo courtesy of Stacie Turnbull, Iowa State University.)

level. The main spearhead of this effort was Jim Guilinger. For those who knew Jim Guilinger, know that he never gave up. Jim always believed in action and not talk. I knew early on that you needed Jim on your side and to always keep your promise with him. He was the perfect man for this courageous effort to re-establish Agricultural Education as a leader in educational programs in Illinois.

Soon after the establishment of ILCAE, an Agricultural Education line item was established on the Illinois State Board of Education budget in 1987 in the amount of \$48,500. This historic event established another organization called the Illinois Committee for Agricultural Education (ICAE). These 13 individuals are governor approved to distribute the line item funds. From this day forward, Agricultural Education and Illinois FFA have strengthened considerably at the state and national levels.

One of the first items of business was to re-establish the traditional supervising system. Initial funds were used to establish another group called Facilitating Coordination in Agricultural Education (FCAE). The funds were used to hire five district field supervisors and a coordinator. Of course, the first FCAE Coordinator was Mr. Jim Guilinger. The purpose of this group of individuals is to support local agricultural education programs in the trenches, where it is needed the most.

The FCAE staff has made tremendous strides in curriculum development. Currently, there are over 480 lesson plans on four CD's addressing various courses and subject matter. Once these CD's were established then the FCAE organization created a website (www.agriculturaleducation.org) with Powerpoint lessons from each

CD. This enabled teachers to utilize a variety of teaching methods with the new innovations of technology. This organization also designed a matrix program on the website that any Illinois teacher could access. The matrix is utilized to create teaching calendars from the four CD's. You can change a course outline in a matter of minutes. Did I mention that all of these lessons are linked to Illinois Learning Standards! Agricultural Education in Illinois was the first educational program to have their curriculum linked to the Illinois Learning Standards. These CD's have been mentioned by Illinois Educational Leaders as the model on which other educational programs needed to replicate.

The state also utilizes an incentive grant application to reward agricultural education programs for their activities. Over 42% of the line item funding is given back to secondary agriculture programs every year. The amount of funding is determined by the activities conducted in the local program from the previous year. The incentive grant application is designed to reward teachers for their efforts in their local program. Last year's average incentive funding per program was \$2,500. There are no matching funds involved. The teacher can spend the money on any educational item desired. It could be technology, curriculum, equipment, or even a lay-a-way plan for a greenhouse. This type of funding has strengthened our secondary programs even further. In several cases, the agriculture classroom is the most technologically advanced room in the school!

The Agricultural Education line item has now grown to 2 million dollars. There are now over 24,000 high school students (51% increase in the last decade) being educated in over 300 agricultural education classrooms in Illinois. FFA member-

ship is now over 16,000 members (34% increase in the last decade) strong and growing. There has been over 156,000 K- adult students that have been served through agricultural literacy projects. Sixty-seven percent of the graduating seniors in Illinois, who were enrolled in agriculture courses, enter post-secondary education. Nationally, only 39.7% of high school students enter post-secondary education, while the Illinois average is 49%.

Agricultural Education in Illinois is strong and striving to be the best. Teaching agriculture in Illinois has done a 180° turn in fifteen years. Innovative thinking and leadership has put Illinois back on the map. Teaching agriculture is fun again, because the classrooms are full and there are resources to be used. Teaching agriculture is easier, because of the unlimited amount of exceptional instructional materials. Teaching agriculture is respected, because of the support structure and state leadership. Just as Winston Churchill once said at Oxford University's commencement ceremonies, "Never, never give up!", the same can be said about Agricultural Education. We must never give up looking and training qualified teachers! We must never give up trying to improve our agricultural education programs! Finally, we must never give up on our students that enter our classrooms!

This article is dedicated in memory of Mr. Jim Guilinger, an innovator, a mentor, and a friend.



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The Latest Trend: Aligning with Standards

By M. Susie Whittington, Jamie Cano, James Connors, and Neil Knobloch

What trends are shaping curriculum? The impetus for realigning teacher preparation programs in agricultural education emanates from six major issues and events:

~ Agricultural educators need to develop a common philosophical and theoretical foundation for preparing teachers of agriculture.

~ The National Research Council (NRC, 1988) recommended changes in preparing teachers of agriculture based on innovative programmatic leadership at the state and national levels.

~ The *Strategic Plan for Agricultural Education* (1989) called for collective, systematic, and effective efforts to elevate and extend the standards of excellence in agricultural education, to serve all people equally without discrimination, and to provide leadership and cultivate strong partnerships in education leading to the contribution of a process and plan that would generate reform.

~ The *National Strategic Plan and Action Agenda for Agricultural Education* (2001), reiterated the call for action of the 1989 plan calling for: (a) highly motivated, well-educated teachers to teach in and about agriculture, food, fiber and natural resources in grades pre-K through 12; and, (b) partnerships and strategic alliances that ensure agricultural education's continuing presence in K through 12 education.

~ The American Association for Agricultural Education (AAAE) adopted a set of national standards

for improving agricultural teacher education programs in December 2001. The AAAE standards bridge the calls for action outlined by the 1989 and 2001 strategic plans with the need for teacher education reform.

~ Teacher education programs are accountable to national and state standards to improve the quality of teacher preparation. Therefore, preservice agriculture teacher education graduates must pass standards-based exams for certification and licensure (Latham, Gitomer, & Ziomek, 1999).

Thus, the past decade has seen an ever-increasing demand for more rigor and accountability in teacher education programs. One approach to addressing the accountability issue has been through the development and implementation of standards.

In a review of literature, seven themes were identified as being critical to the success of new models for preparing teachers. First, teacher educators must model the knowledge, skills, and dispositions of a caring, compassionate, and competent teacher (Darling-Hammond, 2000; Kettlewell, Kaste, & Jones, 2000). Second, teacher preparation programs should be created, implemented, and evaluated based on a body of knowledge consistent throughout the nation for what all teachers need to know to be effective (Darling-Hammond, 1997; Fullan, Galluzzo, Morris, & Watson, 1998). Third, the delivery of teacher preparation programs needs to shift from on-campus, formal college classroom settings to clinical learning (Task Force on Field Experience Standards, 1999; Thiessen, 2000). Fourth, university teacher educators should conduct collaborative teaching and

planning to model integration and improve the articulation of teacher preparation courses experiences (Early, 2000; Murray, 2000). Fifth, collaborative partnerships with cooperating centers need to be established and cultivated, and cooperative teachers should be campus partners as well (Lynch, 1997; Thiessen, 2000). Sixth, technical, pedagogical, and professional knowledge needs to be integrated within and among technical and general education courses for conceptual understanding (Lynch, 1997; Thiessen, 2000). Seventh, all university faculty, including the arts and sciences, need to model effective teaching and create collaborative teaching and planning teams across departments and colleges (Early, 2000; Lynch, 1997; Thiessen, 2000).

A model for preparing teachers in agriculture has been developed based upon the philosophical and theoretical bases underpinning the discipline:

1. Learning by doing through practical education (Knapp, 1894; Lever, 1952);
2. Experiential learning (Dewey, 1938; Kolb, 1984);
3. Solving real problems (Lancelot, 1944);
4. Social cognition (Rotter, 1966) and human agency (Bandura, 1997);
5. Andragogy (Knowles, 1985); and,
6. Reflective practice (Schon, 1988).

A model for preparing teachers in agriculture focuses on the developmental needs of pre-service students with sequential stages that build on prior knowledge and experiences in each year of the 4-year program. Further, students grow and develop

their professional, pedagogical, and andragogical knowledge through field experiences and contextual learning.

The 2+2 program design helps guide students through foundation and exploration stages that lead to understanding the philosophies, theories, and careers related to teaching and learning in agricultural education. Students apply for professional standing after completing the 100 and 200 levels. The focus of the 3rd and 4th stages of development is planning and practicing as a professional teacher.

The pre-service program will develop technical, pedagogical, and professional knowledge. The technical knowledge will be developed through study in technical courses outside of the Agricultural Education major. The courses in the major will develop knowledge, skills, and dispositions related to pedagogical and professional knowledge.

The teacher preparation curriculum in agricultural education serves as an important framework and process for the development of Agricultural Education teachers who possess the knowledge, skills, and dispositions of being qualified, competent, and caring teachers. Policymakers, communities, schools, and other stakeholders in public education are demanding greater teacher quality, but the quality teaching and learning being sought for America's schools will only be realized through quality pre-service teacher preparation programs that align with state and national program standards.

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Curriculum Integration in the Volunteer State

By Brian Parr and M. Craig Edwards

Many agricultural educators are familiar with the concept of curriculum integration, and some are aware of the great learning potential that it holds (Grubb, 1995). But is this tool being used such that it helps to achieve maximum student performance? In many school systems, neither agricultural education teachers nor general education teachers (e.g., math, science, or English) embrace this concept in a way that demonstrates its full potential (Bottoms & Sharpe, n.d.).

This article explores why curriculum integration is not more frequently used as a productive educational tool. A case study (Parr, 2000) performed at David Crockett High School in northeastern Tennessee provides data from which several conclusions are drawn. Planning for a curriculum integration project, its implementation, and the initial outcomes are described through examples of practices that proved effective at Crockett High School.

This study found that a major barrier to implementing curriculum integration was the lack of effective communication between teachers. For example, many of the general education teachers were unaware of how their students could benefit from a curriculum integration project with the agricultural education department. Specific questions were posed to the teachers (N = 21) about opportunities for curriculum integration with their local agricultural education department; responses follow.

~ Less than one-half of the teachers agreed or strongly agreed that there was common content taught in their general education courses and in the agricultural education program.

~ However, more than three-fourths of the teachers indicated that they would like to know more about the subject areas taught in agricultural education. (This response revealed a promising attitude about the interests of general education teachers regarding agricultural education.)

~ A majority of teachers indicated that they believed an integration project with agricultural education could be a beneficial learning endeavor for their students.

~ Seven in ten teachers expressed a willingness to participate in an integration project with the agricultural education department. (Again, a promising attitude toward curriculum integration efforts in the future.)

~ However, less than one-fourth of the teachers perceived that they could teach their curriculum better by having access to resources in the agriculture department. (Unfortunately, many general education teachers did not realize the vast resources available in the agriculture department that could be used in their subject areas.)

~ Moreover, 90% of the teachers either strongly agreed or agreed that most students benefited from applied learning such as hands-on activities.

Interestingly, this response appears to "contradict" other findings. Again, this incongruence was likely due to a lack of communication between general education and agricultural education teachers. If this was the case, how might agriculture teachers attempt to bridge this gap?

Based on the study's findings, it was decided that the "problem," in large part, was a failure by agriculture teachers to properly inform

their general education colleagues about the potential benefits of interdisciplinary collaboration. Several activities were implemented to "spread the good news" about opportunities for integrating agricultural education and general education curriculum. A guided tour of the agricultural education department's facilities was the first step. Many general education teachers had never explored the school, especially the more remote sections of campus where agriculture departments are frequently located. During the tour, teachers commented frequently that they were unaware of the depth and breadth of agricultural education.

Another strategy was to hold conferences between teachers to compare and explore curriculum, and to search for curricular opportunities on which to collaborate. (An appeal to your local administrators for release time to collaborate is suggested. Granting in-service credit to teachers who devote out-of-school time to developing curriculum integration projects is also recommended.) The following description explains a curriculum integration project that was successful at the David Crockett High School in Washington County, Tennessee.

The project began with a conference between the agricultural education teacher and the physics instructor. The teachers decided that each department could be an asset to the other (Bottoms & Sharpe, n.d.) in teaching the theory and basic operation of internal combustion engines. The physics instructor decided that if the agricultural mechanics small engine laboratory was incorporated into the lesson, then a greater degree of student comprehension would be achieved. Consequently, the teachers decided to develop a unit on small

gas engines that they would "team teach." In addition, they would use peer tutoring extensively during the lesson for the reinforcement of key concepts and principles.

The two courses involved in the project were *agricultural power and machinery* and *general physics*. The instruction began with two intact classes. Students in the agricultural class discussed and practiced engine operation, parts identification, engine disassembly and reassembly, as well as troubleshooting and repair. The physics students focused primarily on the theories undergirding the internal combustion engine and the physics involved during operation. Next, the classes were brought together.

During this part of the project, the students took over the role of instructor. The physics students prepared a presentation based on what they had learned about theoretical aspects of the internal combustion engine. Their presentation was delivered to the agricultural students.

Following the presentation on theory, the agricultural students led the physics students through a multi-station rotation in the agricultural small engines lab. The rotations included "practical" aspects ranging from part identification to troubleshooting problems with engines. The rotation was followed by a discussion about the concepts and principles that had been presented to both groups.

It was apparent that each group's presentation enhanced the other's learning experience. The groups shared knowledge in a fashion that provided support for, and illustration of, the prior knowledge held by each. Moreover, the collaboration produced an additional effect that was not foreseen by the teachers but proved to be one of the more significant outcomes. That is, the perceptions of each group toward the other

changed. Both groups—agriculture students and physics students—held a newly found level of respect for the other that was not detected at the onset of the project. So, not only did the teachers understand better what their programs had to offer one another, but also their students realized what they, as individuals, had to offer and receive from one another.

One of the most important issues facing secondary agricultural education is demonstrating the value of our program in the context of today's educational system (Shinn, 2002). Many of "us" believe that agricultural education can be a "premier tool" for relating tangible applications to theory-based principles in science as well as mathematics, thus increasing students' overall learning and retention (Hitz & Scanlon, 2001). Yet, do most school officials view agricultural education as an instructional program that is useful in the quest to improve learner performance across the curriculum? Frequently, no! Accordingly, effective and sustained curriculum integration efforts could change this perception.

Further, in many states, "high stakes testing" or "gateway exams" have been implemented. So, if it can be demonstrated that learning experiences in the context of agriculture can influence student achievement positively, as measured by these tests (Chiasson & Burnett, 2001), that also should help to identify agricultural education as a valuable "player" in the national effort to improve student learning. That is, we should be seen as a part of the *solution* and *not* as a part of the *problem*. Conversely, if this perception is not one that is valid and well established, agricultural education may become an "expendable accessory" as America attempts to define its 21st century educational system.

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Transforming the Curriculum for the 21st Century

By Shanna A. Davis
and Neil A. Knobloch

The way a curriculum is organized can influence the way content is taught. In the past decade, there has been a trend to move toward an integrated curriculum. The purpose of this article is to review two types of curriculum models and suggest how teachers can move from a behaviorist competency-based model to a constructivist-integrated model.

Competency-Based Curriculum Model

In Ohio, there are two major types of curriculum models in career and technical education: (1) Occupational Competency Analysis Profiles (OCAPs), and (2) Integrated Technical and Academic Competencies (ITACs). A competency-based curriculum model has been Ohio's framework for vocational education since the 1960s. The OCAPs were developed in the late 1980s by panels from businesses and companies for approximately 60 occupational areas. Each OCAP includes separate lists of occupational and academic competencies with competency-based assessments. The competency-based curriculum was effective in setting standards for vocational education during the 1960-90s, in providing the framework for accountability in the programs, and for identifying student competencies on career passports for employers and postsecondary institutions. Occupational training was the primary focus of the competency-based model.

Integrated Curriculum Model

In the mid-1990s, employers demanded that students be taught in ways that reflected the higher-order

academic and technical competencies that students need for career success (Ohio Department of Education, 1999). The Carl D. Perkins Vocational and Technical Education Act of 1998 called for an integrated curriculum of technical and academic competencies that "all students are taught the same challenging academic proficiencies as all other students." In 1998, Ohio began the process of shifting from a competency-based curriculum to another type of a curriculum model. The integrated curriculum model, Integrated Technical and Academic Competencies (ITACs), served as the curriculum framework for education with a career focus. Like Ohio, many states switched their focus from a goal of preparing for entry-level jobs to preparation for careers and continuing education.

The ITACs are a resource for local school districts to plan educational programs and redesign curriculum, instruction, and assessment to integrate academic and technical content areas based on constructivist teaching and learning. Educators representing all aspects of elementary and secondary education developed the ITAC model. The ITAC model was organized into six strands that thread throughout the entire model: (1) solving problems and thinking skillfully, (2) working responsibly, (3) communicating effectively, (4) planning and managing a career, (5) applying technology, and (6) managing resources. The competencies were developed for each strand, and each strand features real-world scenarios and guiding questions that set the stage for active, problem-based learning. The integrated curriculum model is intended to help instructors expand

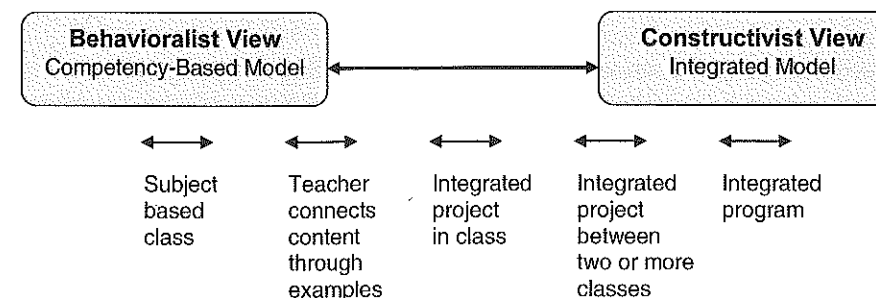
student options for achieving career and educational goals; integrate instruction and include active, project-based learning; prepare students with a broad base of transferable career skills; build partnerships between education and business/industry; and support proficiency test scores (Ohio Department of Education, 1999).

The Implementation Challenge

The integrated curriculum model has been received with mixed responses. There has been a wide range of support from stakeholders and policy-makers in the development of the integrated curriculum model. The implementation process has not seen the same support. Integrated curriculum models closely follow a constructivist viewpoint. Due to this constructivist view, the integrated models are more open, allowing for "soft skills." It is more challenging for teachers to evaluate student learning in the integrated model. Assessment is authentic and allows students to construct knowledge through learning experiences. Competency-based curricula are very structured with objective assessments, which makes evaluation easier for teachers to conduct. Competency-based curricula have outcomes that are easily measured. The competency-based curriculum model resembles a behaviorist viewpoint.

There are some practical steps teachers may take when moving from a competency-based curriculum to an integrated curriculum. It is important that teachers reassess their philosophy of teaching and beliefs about how students learn. If teachers find that their beliefs closely resemble behaviorist views, then

Figure 1: Stages of Integration



their teaching style may not support an integrated curriculum model. It may be more difficult for teachers that have behaviorist views to begin to shift to an integrated curriculum model, so these teachers may choose to integrate in smaller ways. Those who support behaviorist views of learning should not begin by trying to rewrite the curriculum to completely integrated education program. It is suggested that these teachers start small. First integrate one project, then move to integrating a unit (Jacobs, 1989). Figure 1 illustrates a continuum of stages of integration ranging from a behaviorist view and competency-based curriculum model to a constructivist view and integrated curriculum model.

In subject-based classes, only one subject is taught in class and no ties are made to other subject areas. This differs from a curriculum where the teacher teaches the class topic and gives examples of how the topic may be applied to other subject areas. The next stage toward integration is an integrated project in

the classroom that involves subject matter from multiple classes. Moving closer to complete integration, two or more classrooms may combine to complete an integrated project. The final stage is an integrated program where teachers work together to create a curriculum that works together in total integration. Table 1 illustrates examples of projects at various stages of integration.

When implementing an integrated curriculum, it may be necessary to assess one's philosophical view of learning and make gentle transitions between stages. Moving from a behaviorist-based program to a constructivist-based program requires patience, effort, and cooperation between the teachers, students, and administrators in a school system. When trust, openness, and cooperation lead to implementing constructivist-integrated curricula, the results are likely to be students that are well-rounded in solving problems in their careers and lives with a strong background in all

Table 1:
Examples of
Integration

Example	Stage	Description
Lesson about woodworking	Subject-based class	The teacher demonstrates how to cut two pieces of wood. There is no discussion about angles, or measurements and the math relationship of the activity.
Discussion about equine anatomy	Teacher connects content through examples	The agricultural teacher discusses the anatomy of a horse and makes reference to similarities between humans and horses. The teacher asks students to remember the anatomy lesson from health class.
Calculating the holding capacity grain silo	Integrated project in class	The teacher requires students to calculate the volume of a grain silo using principles learned in Math class.

subject areas.

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Emerging Trends: Distance Learning

By Nancy J. Trivette and Sharon Kinsey

This past spring, Brian Martin and John Neyhart, both agriculture instructors at Monmouth County Career Center in Freehold, New Jersey, taught courses to more than 40 students spread out among three area schools with agricultural education programs. During April and May, Martin and Neyhart team-taught a horticulture unit via distance technology to students at Freehold High School in Freehold, NJ, Allentown High School in Allentown, NJ, and Monmouth County Career Center, also in Freehold. With a little technological wizardry, they were able to get the phone lines working, the cameras rolling and the monitors displaying pictures. And for the most part, the students loved this new delivery system.

As part of a collaborative effort

between their school district and two other schools with agricultural education programs, the three schools shared instruction and teaching knowledge. Funding for the project was achieved through a collaborative grant agreement provided by the Office of Agricultural Education, New Jersey Department of Agriculture, in collaboration with the New Jersey Department of Education. Such grants were truly an outgrowth of New Jersey's Reinventing Agricultural Education for the 2020 initiative, as stated in the state strategic goals.

State Goal #3 addresses the concept of sharing resources: "By 2008, resources for education in food, agriculture and natural resources will be shared between states, regions and school districts."

Certainly, distance learning is becoming more of a norm in educa-

tion as funding and geographics impact the delivery of educational lessons. In fact, Neyhart says that's initially what generated the most interest from his students. "They got excited about what was going on with all the technology, because this is where it's headed. The use of distance learning technologies may be commonplace in 10 years, but right now it's cutting edge."

Not only did students get excited about their involvement in a distance learning experience, but so did the technology coordinator at Monmouth County Career Center. The school district had invested money into the distance learning equipment, said Neyhart, but many weren't utilizing it. In fact, Allentown High School did not have the equipment, so the Monmouth County Career Center loaned some equipment. Then the technology coordinator would travel to Allentown High School each week

to assist with the set-up and serve as the technology resource person.

Neyhart says it was a challenge getting the phone lines set up, as it was a whole new way of delivering instruction, but it shouldn't get in the way of trying to use distance learning. He even took a class on the use of distance learning equipment offered by his school district so he could manage the equipment in his classroom without needing a technology expert.

Specifically, this grant allowed the three schools to conduct weekly lessons via distance learning technologies. Costs for technology included the phone connection, monthly line charges, and connection charges. Monmouth County Career Center served as the lead school, and requested funding for equipment to convert photos of plants from the plant identification list into pdf files, as well as a high quality printer.

The objective of the unit was to dialogue about plant identification, how pests attack plants, and the life cycle of pests. "It was pretty neat to use the technology. I could have a remote control to work the camera and then be able to show a shot of the microscope to view a live sample of a grub or aphid magnified at 30x. The view was so good, students could see how ugly this insect is," laughed Neyhart.

For teachers interested in incorporating distance learning technologies into their curriculum, he suggests: "Choose a subject you are very comfortable (with) so you can keep everything balanced." The addition of managing the technology aspect of the lesson can be challenging but Martin generally assisted him with handling the technology to ease the need to attend to all the details of running the equipment. They switched roles when Martin would teach.

Since Neyhart and Martin taught the unit for "Insect, Disease and Plant Identification", they prepared the course materials ahead of time and emailed the lesson plans to collaborating teachers by Thursday for a Monday class. The 50-minute lesson normally included the use of handouts, live samples, and digital pictures with a follow-up homework assignment. Additionally, power point slides with diagrams were used, as well as chemical control sheets, student group projects and newspaper headlines demonstrating the reality of plant and pest problems getting their attention with such headlines as, "Yankees Claim Fourth Loss in a Row Blamed on Grub Problem in Fenway Park."

The plant identification list from the National FFA Nursery Landscape Career Development Event (CDE) was used to teach the plant identification portion of the unit. This material assisted teachers in preparing students for competition in the state Nursery/Landscape CDE, in which all three schools normally compete. A portion of the grant monies paid for plant material so students had access to the live plant.

Cyndee Roszel, agriculture instructor at nearby Allentown High School, Allentown, NJ, felt the collaboration was beneficial in the respect that:

- Students from different school districts were introduced to one another.
- Students were exposed to various styles and methods of teaching.
- Current information on plant diseases and pests was supplied.
- Group projects enabled

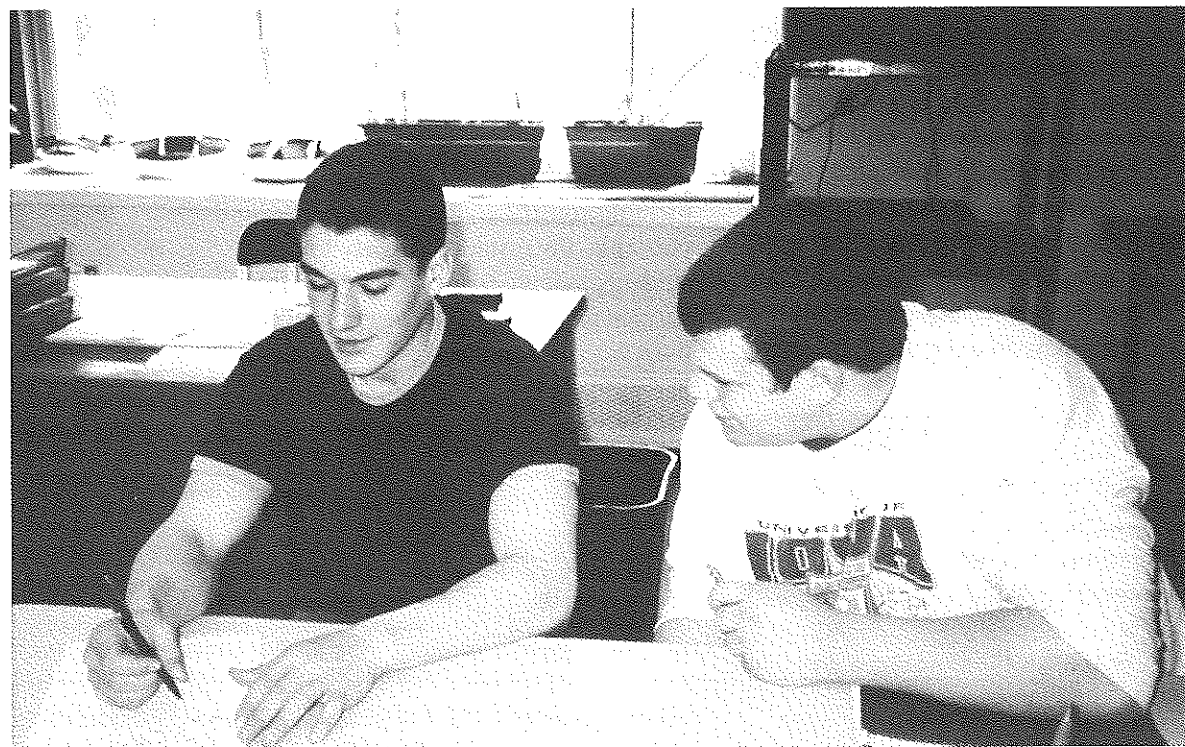
students to share their comprehension of the material.

Like anything, she noted, some students liked this presentation method, while some did not. How would her students have enjoyed it even more? "My students wanted to offer more to the program, but it wasn't set up that way. I believe they also would have liked more back and forth discussions between classrooms," she commented.

Neyhart is anxious to continue this partnership and feels it can offer students a unique learning experience. Roszel "would like to see this project continue, but it may depend on whether we can afford the DSL line since it was very expensive. Grant money is probably essential to continuing this project."

Overall, "The lesson plans are similar to what I would teach in the classroom without the distance learning component. The technology adds a new dimension to learning and the students enjoyed that," said Neyhart.

With the increasing technological advances, distance learning is more commonly used in agricultural education. Classrooms are no longer defined by students in the same location. (Photo courtesy of Roland-Story, IA Agricultural Education Department.)



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Integrating Math and Science into Agriculture

By Anna Melodia and Tony Small

In 1988, the National Research Council recommended that all students needed a basic understanding of math and science concepts and that teaching math and science through agriculture was an effective approach to student learning (National Research Council, 1998). The American Association for the Advancement of Science (AAAS) recommended that students learn better through real world connections such as problem solving or work-related activities (1992).

Agriculture programs are being closed across the country in face of increasing demand of accountability and standards regarding student achievement in math, science and other core competencies. Additional "seat time" is not the answer to student academic achievement. Instead, agriculture educators must promote the strength of the integrated model of agricultural education. Simply, agricultural education provides not only the context, but the content for students to be successful in math and science.

According to the AAAS (1992), effective math and science teaching and learning occurs through the integration of concepts and principles that are problem- and real-world based, moving them from the abstract to the concrete. It requires different ways of looking at complex principles and applying them to dynamic, meaningful examples. It makes sense then, that agricultural education—instruction, supervised agriculture experiences, and FFA—provides a model that would support the integration of math and science.

Why? First and foremost, it builds on the foundation of the constructionist theory of student

learning. Second, it is "lived out" in a powerful and dynamic model called "contextual teaching and learning" that helps teachers relate math and science content to real world situations and motivates students to make connections between knowledge and its application to their lives and engage in the hard work that learning requires. It is a holistic set of instructional strategies that:

- ~ Emphasizes problem-solving;
- ~ Recognizes the need for learning to occur in a variety of contexts;
- ~ Teaches students to take ownership of their learning as self-regulated learners;
- ~ Anchors teaching in diverse, real-life, and meaningful contexts to the students;
- ~ Encourages students to learn from each other; and
- ~ Employs ongoing authentic assessment.

Contextual teaching and learning, in regards to math and science integration, calls for learning that is (North Central Regional Educational Laboratory):

- ~ **Hands-on:** Students perform math and science as they acquire understanding.
- ~ **Minds-on:** Activities focus on core concepts, allowing students to develop thinking processes, ask and answer questions that enhance their knowledge.
- ~ **Authentic:** Students are presented with problem-solving activities with real-world questions and issues which support collaboration and communication.

This leads to the development of a learning community, where the teacher is the manager of a total educational experience and not the

only source of knowledge or expertise. It encourages active involvement and engagement, reaching and achieving high expectations, and discovery of self and a passion for learning. Contextual teaching and learning occurs in an agriculture class with a caring, competent agriculture teacher who is interested in addressing each student as unique, whole individuals.

Student development theory guides the design of intracurricular activities with agricultural education. This is both integrative and directional in nature; moving students towards greater complexity and competency in understanding self to a role in the community and beyond. FFA provides many of the tools and resources for life skills, leadership development and career success that are wrapped into the units of instruction. This focus on academic achievement, career success and leadership development is the "value-added" element that is offered in agricultural education.

With the context for learning established, the integration of math and science in the agriculture curriculum occurs naturally across the range of content areas. Specific learning objectives in science are addressed through units on soils, animal reproduction, nutrition, natural resources, horticulture and many more common areas of agricultural education. Math objectives can also be taught through units on agribusiness, agricultural mechanics landscaping and surveying. The first step is understanding these relationships and being intentional in addressing them.

Some examples of how science and math standards can be cross-walked to agricultural education are:

Photosynthesis Inquiry – How does the stomatal density of a plant's

leaves determine its photosynthetic pathways and efficiency; stomatal counts and measurements using microscopes:

- √ *Ag Standard-* Green plants transfer the sun's energy into chemical energy through photosynthesis.
- √ *Science Standard-* Investigate how the process of photosynthesis provides a vital connection between the sun and energy needs of living systems.
- √ *Math Standard-* Make decisions about units and scales that are appropriate for problem situations involving measurement.

Simulate the spread of disease in a population- Using a random number generator function on the calculator; exponential growth of bacteria, viruses and fungi.

- √ *Ag Standard-* Knows elements of a health and sanitation program for animals (disease prevention and parasite control).
- √ *Science Standard-* Explore the impact of scientific knowledge and discoveries on personal and community health.
- √ *Math Standard-* Identify quantitative relationships in a situation and determine the classes of functions that might model the relationship.

A quality agriculture program should provide experiential opportunities, leadership development programs, and laboratory experiences along with classroom instruction. Math and science learning objectives should be accomplished throughout.

The FFA component addresses math and science in the career development event areas, proficiency award areas and degree and award applications. Using math and science

in degree and award applications can be accomplished. For example, you are able to relate science by helping students better understand how to increase production efficiency factors in placement opportunities. Math is used throughout to figure net worth, measure production or using common accounting principles.

The Supervised Agricultural Experience (SAE) component addresses integration by having students understand how math and science skills apply to their specific program. Increasing their awareness of practical uses will assist students to understand how these skills can increase efficiency or production.

It is important that a quality agriculture teacher recognize he/she already integrates science and mathematics in many ways. The next step is to be intentional about integration. Teachers must understand the core competencies and standards to which the school and state are being held accountable. A third step is to engage key stakeholders in this process—as partners and promoters of agricultural education. Following are some practices to increase your base of support:

Teachers:

- ✦ Develop partnerships with math and science colleagues. This will increase awareness of the amount of math and science in agriculture related subjects.
- ✦ Share resources with math and science teachers to increase the quality and quantity of materials.
- ✦ Invite math and science teachers to attend training opportunities with you.
- ✦ Continue your own professional development in understanding math and science integration.

Administrators:

- ✦ Become informed of the changes necessary regarding

education reform, standards and accountability.

- ✦ Provide leadership, resources and support for teachers to collaborate across departments, while encouraging professional development.
- ✦ Develop a plan for students to receive science credit for agriculture classes.

To insure successful and strong local level programs for years to come, it is increasingly important to show how agricultural education is an important link in the education system. Accountability is going to be taken to the next level. Use your passion for agricultural education and make the connection to all your available resources.

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Leadership Development in an Urban Program

By Levon T. Esters

As I reflect on my teaching experience at the Chicago High School for Agricultural Sciences (CHSAS), I often wonder what aspect of the curriculum encouraged the leadership development of our students the most. Was it the FFA leadership training and career development events? Or maybe it was the Supervised Agricultural Experiences (SAE) that our students chose. How about the rigorous educational experiences or various community service projects?

Based upon my experience, there are four areas that influenced the leadership development of CHSAS students. These areas include: classroom instruction, Supervised Agricultural Experience (SAE), FFA, and work-based learning.

Classroom Instruction

Classroom instruction offers students an opportunity to develop their leadership potential. One key to developing the leadership abilities of students at CHSAS was to make experiences pertinent and make connections to the "real world". Activities that extended the students' capabilities or potential made a difference in developing student leaders. Teachers discovered the more practical the in-class activities were, the more involved students were in the learning process.

New methods of classroom instruction have also provided leadership development opportunities for students in other agricultural education programs. For example, students in the Wauseon High School (Ohio) agricultural education program use the *Wall Street Journal* classroom edition to make real world connections, sharpen their reading skills, understand the economy and

become informed citizens. All are important aspects of becoming a successful leader (National FFA Organization, 2002a).

In Arizona, Peoria High School students apply for classroom managerial positions, including that of "make-up manager". In this position, the student assists peers whose course performance has slipped or who have fallen behind in their assignments (National FFA Organization, 2002a). Students in these positions gain a sense of responsibility and self-confidence by managing certain tasks, that also help develop leadership skills.

Supervised Agricultural Experience

Leadership skills can be developed in almost any type of educational activity. Obtaining work experience is a specific type of activity that offers many students the leadership skills that they will need in post-secondary education or an entry-level position after high school. Responsibility, setting goals, conflict resolution, and time management are all valuable skills that students obtain by becoming involved in quality work-related experiences. An important aspect of the curriculum at CHSAS is the Supervised Agricultural Experience (SAE) that can offer students these types of experiences. SAE is an opportunity for students to engage in planned experiences with projects at schools and local businesses. SAEs should include time in research laboratories, banks, food retailing and marketing and work with commodity markets, elementary schools, and many other new areas (NRC, 1988).

Although SAE opportunities in an urban agricultural education program differ from those offered in traditional programs, the basic concept remains the same. For example,

students have started their own businesses to satisfy the SAE requirement. Businesses started by past students include: landscaping, dog grooming, floral design, and small animal care. Many of these businesses have been quite successful and turned into profitable careers for former students. These businesses help students to improve their decision-making and communication skills and gain valuable experiences to develop their potential as a leader.

Other agricultural education programs have developed innovative methods for student SAE projects. Instructors at William Penn High School in New Castle, Delaware, work closely with the community to develop creative supervised agricultural experience programs for students who have no access to traditional ones (National FFA Organization, 2002d). For example, one student uses her horticultural skills at a day care center where she works to teach students how to grow plants. Other SAEs may range from community service projects such as fence-mending to horticulture therapy at a senior citizen center.

Agriscience students at Concordia High School in Concordia, Kansas, manage a cooperative for fruit and gift boxes. Students learn how to conduct business correspondence, develop sales, financial, marketing and computer skills as well as learn about production practices from product suppliers, everything needed for a successful SAE in entrepreneurship (National FFA Organization, 2002d). Students function as a board of directors and district salespersons as well as deliver orders that help prepare them for future careers in business and industry as well as develop leadership skills such as cooperation, initiative, and dependability.

FFA

The FFA component is another important area in the leadership development of students. FFA activities have been and continue to be an integral part of the agricultural education program at CHSAS. Through participation in FFA events, students have been able to obtain valuable leadership experiences in both formal and nonformal activities. For example, CHSAS sophomores participate in the Food for America program at local elementary schools on the south side of Chicago. For many students, this is the first time they present in front of an audience other than their peers. Because students work together and plan a presentation, this program offers first-hand experience of the importance of teamwork and personal development, which are all necessary parts of leadership development.

As part of the first phase of a multi-faceted recruitment process, instructors and students at Eastern Randolph in Ramseur, North Carolina conduct a Food for America program and a Fun on the Farm Day (National FFA Organization, 2002b). The Food for America program at Eastern Randolph is conducted three times annually for all students in the school district. FFA officers and selected students, in official dress, explain the importance of agriculture and where their food comes from, using a skit and other hands-on activities.

One inspiring way students can be encouraged to participate in FFA is by meeting past state and National FFA officers from previous graduating classes. CHSAS has produced former state officers, including past National FFA President Corey Flournoy. Corey was the first urban agriculture student and the first African American to be elected to this position. These role models allow students to gain first-hand knowledge of the leadership opportunities that exist in FFA.

Work-Based Learning

Work-based learning is another example of leadership opportunities offered to CHSAS students. Work-based learning combines real-work experiences that allow students to learn valuable educational, employment, and communication skills. For example, senior students have an opportunity to participate in research apprenticeships, where they spend six weeks on a college campus working with a professor on his or her research. Other examples include students who obtain jobs and internships through the Agricultural Cooperative Education (ACE) program. ACE opportunities include placement at the Chicago Board of Trade, United States Department of Agriculture (U.S.D.A.), Kraft Foods, and Quaker Oats, along with other private, state, and federal agencies. These opportunities enable students to sharpen their leadership abilities as they connect classroom experience to real life situations.

Work-based learning, internships, and job shadowing have also become an integral part of other agricultural education programs across the country as well. At Owen County High School in Owenton, Kentucky, a job-shadow career day involves business owners and introduces students to potential employees. The experience occurs as part of a unit on careers in the senior sales and marketing course (National FFA Organization, 2002c).

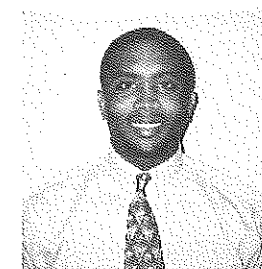
Students in the Carrolton, Missouri Area Vocational-Technical program participate in supervised agricultural experience internships that relate to specific career path areas, giving them an advantage in the market place after they graduate (National FFA Organization, 2002d). Students also develop potential areas of interest by participating in a school-wide job-shadowing program to gain information about occupations that may match their interests.

Conclusion

The key to increasing the leadership development of your students is to get them involved in a variety of opportunities that requires them to use and develop skills they already possess. Encouraging students to develop their leadership skills is something that takes time, effort, as well as new and innovative teaching techniques. By expanding and modifying the four areas discussed here, you can be more effective in developing student leaders in your agricultural education program.

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Agricultural Education and Extension Education: Partners in Learning

By John Ricketts, Kris Grage,
and Nick Place

What would you do if we told you there is a way to get more done in less time and with fewer resources? What would you say if we could enlighten you of a way to improve the quality of your programs, increase your expertise, and expand the opportunities that you can provide your students without attending one more workshop or teacher training session? What would you do if there was actually a way for students to learn more about agriculture, leadership, and life without you having to spend one more night or weekend away from your family?

Do any of these questions peak your interest? If you are reading this article, you are smart enough to know that a magic bullet of this

magnitude is probably not available. However, there is a simple little practice that could move all of us into being more effective and efficient with our students. The simple little practice is something many of us learned around pre-school. It is called "cooperation."

In today's business world as well as the education arena, there is an ever-present pressure to become more successful, effective, and efficient. According to Janice Fauske (2002, p. 1), cooperation "has become a politically desirable descriptor for attracting resources and attention in education." Due to the common purposes of agricultural education and youth leadership development, Cooperative Extension's 4-H clubs and Agricultural Education's FFA chapters can become more effective through cooperation.

In this article, we would like to introduce to you what a group of agriculture teachers and extension faculty in Florida listed as the strengths and opportunities associated with cooperating with each other.

Strengths

According to our panel of experts (agriculture teachers and extension faculty) there are many positive things that can come from working together. One of the primary ways we can improve our youth programs is by combining the expertise, technical knowledge, and skill of the educa-

tors at school with those at the county extension office. As a former agriculture teacher, one author of this paper combined his expertise in *animal science* with the judging expertise of the local extension agent to teach equine science and to train dominant horse judging teams.

Teachers and agents also expressed that sharing resources, educational materials, and facilities cut down on the amount of time needed to develop students' competencies in the activities in which they participated. Mitzi Pigg, an agriculture teacher at Gallatin High School in Tennessee, took a group of students to the National FFA Meats Judging Career Development Event. Mitzi and her team worked very hard to get ready for the National Competition, but they attribute much of their success to the 4-H training that they received from their county extension educator.

When teaching youth in and about agriculture it seems that 1 + 1 might just equal 3 instead of 2. In other words, working together definitely makes us stronger. Aside from teaching equine science or training meats evaluation teams, how else might agricultural educators and extension faculty cooperate for the good of the students.

Opportunities

When our panel of experts was asked about opportunities to cooperate, they listed the local and state fairs as the number one place where they work together. Along the same lines, teachers and extension professionals should also consider cooperating on service projects that contribute to community enhancement, community development, and community education. Additionally, the teachers

Opportunities for Agricultural Education and Extension Education Partnership

- ◆ Fairs
- ◆ Career Development Events (CDEs)
- ◆ Practice
- ◆ Community Safety Program
- ◆ Breeding Program
- ◆ Research workshops
- ◆ Fundraising
- ◆ Contacts
- ◆ Educational Resources
- ◆ 4-H begins younger
- ◆ Exposure
- ◆ Involvement
- ◆ Insurance
- ◆ Food for America program
- ◆ Expositions
- ◆ Field days

and agents believed fundraising was a place where agricultural education and extension could pool their resources. Farm operations such as breeding programs and facility maintenance are also great fields in which to work together.

As professional educators, we could and should continue to think of ways we can work together. Cooperation is not only important in improving student opportunities, but it also helps to develop an effective working relationship between the agriculture teacher and extension agent. Cooperation is imperative. Our panel mentioned several instances where the agricultural educator and the extension faculty member just didn't get along.

Several reasons contributed to this lack of cooperation, such as an imperfect relationship between the agricultural educator and the extension faculty, a lack of awareness, of the each others work, and understanding and perceptions regarding collaboration held by the agriculture teachers and extension faculty that we polled.

Cooperation will not only help streamline and enhance the work

of agricultural educators and extension faculty, but at the same time, will allow those involved to build upon one another's strengths. Just as importantly, cooperation will help to improve the leadership opportunities available to youth in our program.

Cooperation seems like such a simple little practice, doesn't it? Please, we urge you, to pick up the phone or ship out an email to your local extension agent or the agriculture teacher in your area and identify some areas where you can work together. In this day and age of budget cuts and limited resources, a working relationship between two of the most powerful entities in a young person's life could make a world of difference.

If you can think of other strengths, opportunities, or examples of agricultural and extension education cooperation, feel free to send them via email to jcr@ufl.edu.

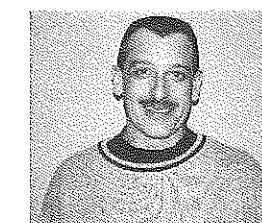
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Please, we urge you, to pick up the phone or ship out an email to your local extension agent or the agriculture teacher in your area and identify some areas where you can work together.

Using Socratic Questioning in the Classroom

By Lori Moore and Rick Rudd

The world is constantly changing, which means it is even more important to teach agriculture students how to think in and about agriculture rather than simply teaching them what to think about agriculture. In fact, Newcomb, McCracken, and Warmbrod (1993) address this notion in one of their *Principles of Teaching and Learning*. According to Principle 11, "To maximize learning, students should 'inquire into' rather than 'be instructed in' the subject matter" (p. 37).

There are a number of different teaching techniques that can be incorporated into the agriculture classroom to teach students to think critically. Socratic questioning is the oldest, and still the most powerful, teaching tool used to help students think critically, analytically, and independently (Foundation for Critical Thinking, n.d.).

In his teaching, Socrates was well known for never answering a question. Instead, he responded by asking more questions. The focus of Socratic questioning is to provide students with more questions to lead themselves to an answer. Asking additional questions requires students to think in and about the concept rather than simply accepting the answer provided by the teacher. This thinking in and about the concept in turn leads to a greater understanding

of the concept involved.

The Socratic Questioning Model

The basic Socratic questioning model consists of four components:

- Origin and source.
- Support, reasons, evidence, and assumptions.
- Conflicting views.
- Implications and consequences.

Each component represents an area in which the teacher can question students. For example, the teacher can ask students how they arrived at their particular point of view. They can also inquire into what evidence they gathered to support their conclusion. The teacher can use questions to identify other points of view and determine the implications and consequences of a particular conclusion based on what is known about the topic and the other points of view. Many

topics taught in agriculture classes lend themselves well to teaching using Socratic questioning.

Example Lesson

To teach a lesson on genetically modified foods, for example, using the Socratic questioning method, a teacher might begin by asking students, "Are genetically modified foods good or bad?" This type of question is basically asked to get at the student's point of view. Let's say, for the purposes of this example, that the majority of students respond that they are bad. If the majority of the students said they are good, the same questioning procedure could be used.

Because in our example the majority said they are bad, the teacher could ask "Why are genetically modified foods bad?" or "How do you know they are bad?" (component #1). Answers should be written on the board or a flip chart so that

students can see them. Just as in brainstorming, the teacher should remain non-judgmental about student responses and write all of them down. To wrap up this section of the discussion, the teacher may ask, "Can anyone else think of why genetically modified foods are bad?"

Once the responses are on the board, the teacher can ask students probing questions to get at how they came to the conclusion that genetically modified foods are bad. For example, if one of the responses was that they are bad because they are dangerous to consume, the teacher might ask, "Why do you think they are dangerous to consume?" One key point to remember when using Socratic questioning is to let the students answer the questions. Do not be afraid of pauses. In other words, do not simply give students the answer when there is a pause. Instead, ask additional probing questions.

The next step would be to question students regarding the information and data on which they are basing their assumption. For example, the teacher might ask, "Do you have any evidence to support your assumption?" (component #2). Many times, students will be unable to support their assumptions with facts and evidence. This situation provides a good opportunity and motivation for students to do some research and learn more about genetically modified foods.

Once students have some facts and evidence, perhaps their point of view has changed, or perhaps it has remained the same. In any event, the teacher might next ask students to identify conflicting views on the topic by asking questions such as, "Who would disagree with your position?" and "Why would they disagree with your position?" (component #3). These types of questions promote critical thinking in that students begin to realize that although they do not

have to agree with other points of view, they do need to recognize that they exist.

The next step in the basic Socratic questioning model is to question students on the implications and consequences of their points of view. In our example, the teacher might ask students, "What are the implications and consequences of believing that genetically modified foods are bad?" (component #4). Again, answers could be written on the board or a flip chart and additional questions asked based on responses.

Notice that when teaching using the Socratic questioning technique, you as the instructor have to be familiar with the material, and you have to anticipate students' answers in the development of further questions. Your questions should lead students to "better" answers through reasoned inquiry. Careful planning of the initial questions is crucial. Below are some tips for using Socratic questioning.

Using Socratic Questioning in the Agriculture Classroom

1. Identify your instructional objective.
2. Plan a sequence of questions that will logically lead students to reasoned answers based on your questions.
3. Keep the discussion focused.
4. Involve as many students in the discussion as possible.
5. Be non-judgmental of student responses.
6. Ask probing questions.
7. Ask questions to summarize material and check for student understanding.
8. Do not be afraid of pauses.

Using Socratic questioning as a teaching method keeps students actively involved in the learning event. Students who are actively participating are less likely to be bored and more likely to concentrate on their learning. The Socratic method of questioning can be used in both large and small classes.

Using the Socratic method in the agriculture classroom takes effort. It takes a lot of thought and a lot of preparation. However, when it goes well, it is well worth the effort. It is enjoyable for not only the students, but for the teacher as well.

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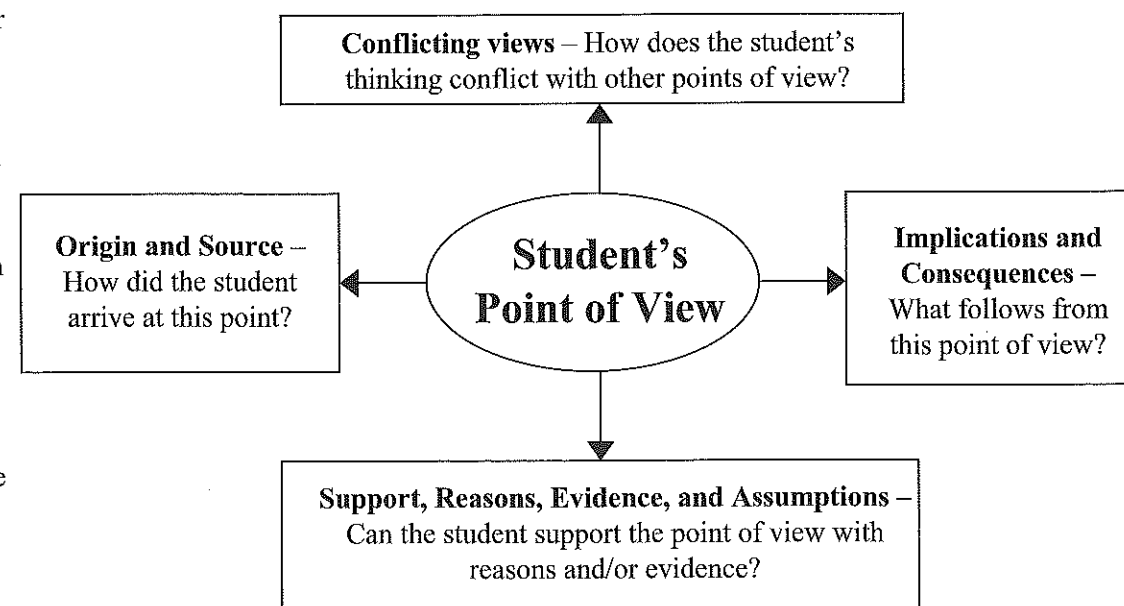
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The Socratic Questioning Model

The Cyber Classroom: Strategies for Using the Internet as an Instructional Resource

By T. Grady Roberts and James E. Dyer

The Internet has worked its way into nearly every aspect of our lives. Schools are not excluded. By investing large amounts of money to connect to the Internet, schools have provided teachers and students with a tremendous source of information. However, with so much information available, teachers and students are often lost in how to effectively manage so much information. Consequently, teachers are often at a loss on how to effectively use the Internet to teach.

Many teachers recognize the tremendous potential of the Internet for instructional purposes. However, few teachers have any formal training in how to use the Internet in an

instructional setting. Luckily, a teacher does not have to be a computer expert to use the Internet as a teaching tool.

According to Dawson (2002), there are five common approaches to using the Internet in the classroom. They are: Topic Hotlists, Webquests, Telecollaborative Projects, Simulations, and Virtual Fieldtrips. Following are some suggestions for using each of these approaches.

Topic Hotlist

A Topic Hotlist is composed of a list of subject related web sites that allow students to openly explore a topic. Creating a Topic Hotlist does not require a tremendous amount of work by the teacher. It can be as simple as a list of web sites given to students on paper, saved as bookmarks in the web browser, or placed

as links in a simple web page. Using a Topic Hotlist eliminates students from aimlessly surfing the web for information.

An example of a Topic Hotlist is a web site that contains links to the beef breed associations. Students are given an assignment to select the best breed of animal to produce the leanest cut of steak with the lowest amount of cholesterol. Students will visit these web sites, gather relevant information, and then select the breed of beef that meets the requirements of the assignment.

Webquests

Like a Topic Hotlist, a Webquest provides students with an opportunity to use the Internet to find information. The difference between a Topic Hotlist and a Webquest is that in a Webquest students are directed

to specific web sites to locate each answer or gather a piece of information. During a Webquest, the teacher serves as a facilitator. A Webquest can be similar to an online scavenger hunt, where students hunt for information in a particular order. Webquests can be designed to last as short as a class period, or as long as a month. Obviously, more preparation work is required of the teacher to search the Internet for relevant web sites where the students can find the information. Components of a Webquest are introduction, task, process, resources, evaluation, and conclusion. For more information on Webquests, visit the website <http://webquest.sdsu.edu/webquest.html>.

An example of using a Webquest in an agricultural mechanics class could be that students are assigned to create a list of tools to buy for a new metalworking laboratory. For each piece of equipment needed, the students will visit the web site for the tool manufacturer, research the required tools, and select the appropriate model for the given requirements.

Telecollaborative Projects

Telecollaboration is simply collaboration that takes place over the Internet. It can take place as interpersonal exchanges, information collection and analysis, or problem solving. An interpersonal exchange involves individuals or groups communicating together electronically. Information collection and analysis involves students collecting, compiling, and comparing data that is shared with others electronically. Problem solving involves students collaborating with others electronically to solve problems.

An example of a Tele-collaborative project could be in a horticulture class while studying a unit on marketing container plants. To see how the local prices compare to national

prices, the students could use email to contact several FFA chapters in different states to collect prices for similar plants marketed in those areas.

Simulations

A Simulation is a computer program that demonstrates a procedure or concept that cannot easily be duplicated in a classroom. It allows students to experiment by adjusting variables, and then observing the results. A Simulation not only has the benefit of being able to duplicate something that could not physically be duplicated in a classroom, it can also be used to replicate expensive activities for a fraction of the cost.

An example of how a Simulation could be used might be in a photosynthesis lesson where students would locate a plant growth simulator that allows for adjustment of the amount of sunlight. Students could be given three different sunlight levels, run the simulation, and then record and compare the results.

Virtual Fieldtrips

As the name implies, a Virtual Fieldtrip allows students to visit a place "virtually" by using the Internet. It can be as simple as photographs and captions posted to a web page, or as elaborate as a multimedia guided virtual tour at a museum. Virtual Fieldtrips have the obvious benefit of allowing students to experience a place that they otherwise would not be able to see. Just as with a traditional fieldtrip, activities are conducted before and after a Virtual Fieldtrip to introduce and summarize the information gained from the trip.

An example of how a Virtual Fieldtrip could be used would be to use it as a recruitment tool for the agriculture program and the FFA chapter by allowing students to "virtually" visit state and national FFA

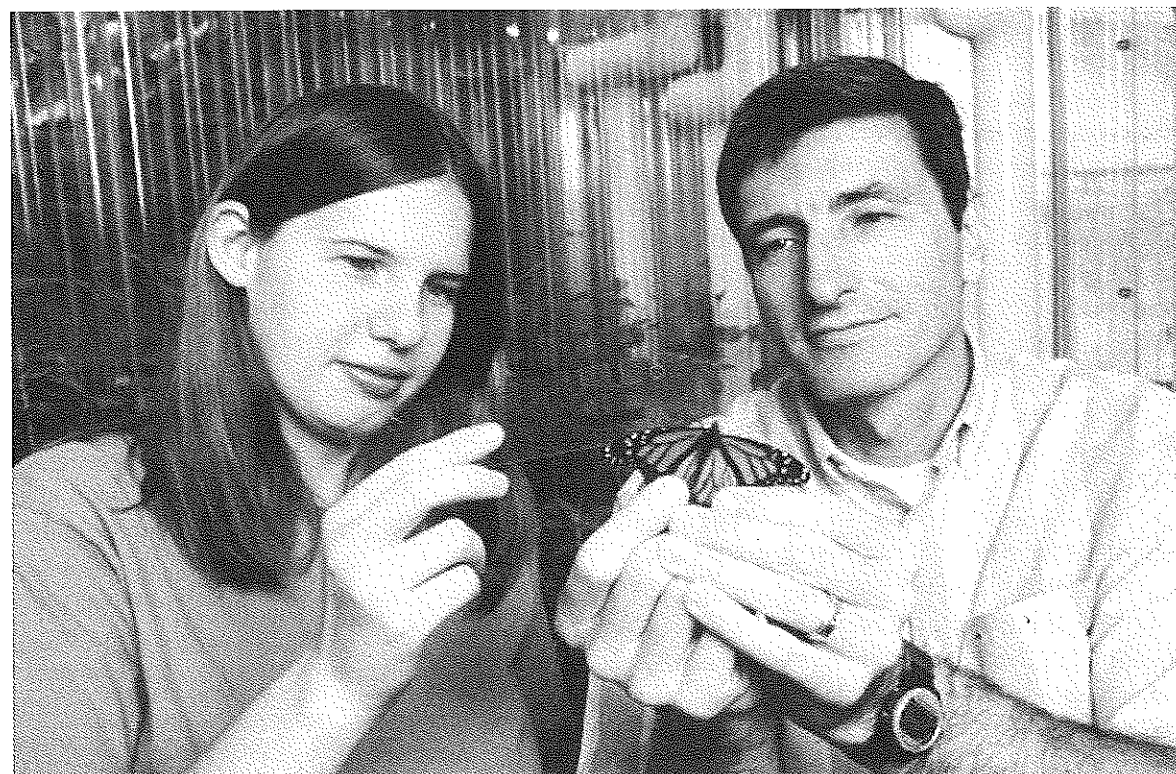
Conventions. Obviously, every student thinking of taking an agriculture class or joining the FFA cannot go to these conventions, so a Virtual Fieldtrip is a solution. By using digital pictures and video clips to replicate these conventions, students can experience these events "virtually."

Conclusion

Using the Internet for instruction can help teachers increase the tools they have to present information to students. Topic Hotlists, Webquests, Telecollaborative Projects, Simulations, and Virtual Fieldtrips are a few tools that teachers have available to use. While the Internet is not a replacement for all other resources, it does offer teachers alternatives to current instructional techniques.

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The Internet can be a valuable resource in the classroom. From using the World Wide Web with a research project, to taking a virtual field trip, Grady and Dyer point out available resources. (Photo courtesy of College of Agriculture, Iowa State University.)



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“The Teacher’s Role”: 2003 Theme

The 2003 theme for *The Agricultural Education Magazine* will be: **“The Teacher’s Role”**. Why not consider developing and submitting an article this year? There can be no doubt that the “teacher” is still the most important active ingredient in the delivery of a successful program of Agricultural Education. Certainly, students must be involved; we must have students, but the “teacher” is the catalyst to recruit, organize, and facilitate learning by students. The teacher is the key. Join us in exploring this exciting topic.

January – February Issue

Theme: *The Role of the Teacher in Agricultural Education*

In this age of rapid advances in technology, what is the new role of the teacher in Agricultural Education? What challenges do teachers face in teaching agriculture today?

Articles Due to the Editor:

December 15, 2002

March – April Issues

Theme: *The Role of the Teacher in Advising Youth Groups (FFA, PAS, Ag Ed Clubs, ATA and Others).*

What is the role of the teacher as an advisor? Are advising opportunities teachable moments or are we merely supervising? What are the challenges in the serving as an advisor? How has the role of the advisor changed? What suggestions would help teachers be better advisors to youth groups?

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Articles Due to the Theme Editor:

February 1, 2003

Articles Due to the Editor:

February 15, 2003

May – June Issue

Theme: *The Role of the Teacher in Conducting Supervised Agricultural Experience Programs.*

As teachers face challenges of increased enrollments and additional demands on their time, what should teachers do to meet the needs for experience-based learning outside the classroom? What can teachers do to improve the quality and quantity of SAE programs? What are some tips on enhancing the teacher’s role in conducting SAEs?

Theme Editor: Michael Woods

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Articles Due to the Theme Editor:

April 1, 2003

Articles Due to the Editor:

April 15, 2003

July – August Issue

Theme: *The Role of the Teacher in Using Advisory Committees and Other Stakeholder Groups (FFA Alumni, etc.)*

Advisory committees are often credited with saving programs of Agricultural Education. How can advisory committees be put to use by teachers of agriculture? What suggestions could help teachers to start and maintain viable advisory committees? What role does the teacher have in conducting advisory committee activities?

Theme Editor: Carlos Rosencrans

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Articles Due to the Theme Editor:

June 1, 2003

Articles Due to the Editor:

June 15, 2003

September – October Issue

Theme: *The Role of the Teacher as a Facilitator of Learning.*

Is teaching just about delivery or is teaching all about facilitation? Who has responsibility for learning? How can teachers of agriculture improve learning by their students?

Theme Editor: Neil Knobloch

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Articles Due to the Theme Editor:

August 1, 2003

Articles Due to the Editor:

August 15, 2003

November – December Issue

Theme: *The Role of the Teacher in Developing and Promoting a Vision for Agricultural Education.*

Where is the profession going? What role does the agriculture teacher have in shaping the future of the profession? What is our vision for Agricultural Education? What visioning process should we use to develop a preferred future for local programs?

Theme Editor: Michael Swan

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Articles Due to the Theme Editor:

October 1, 2003

Articles Due to the Editor:

October 15, 2003

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