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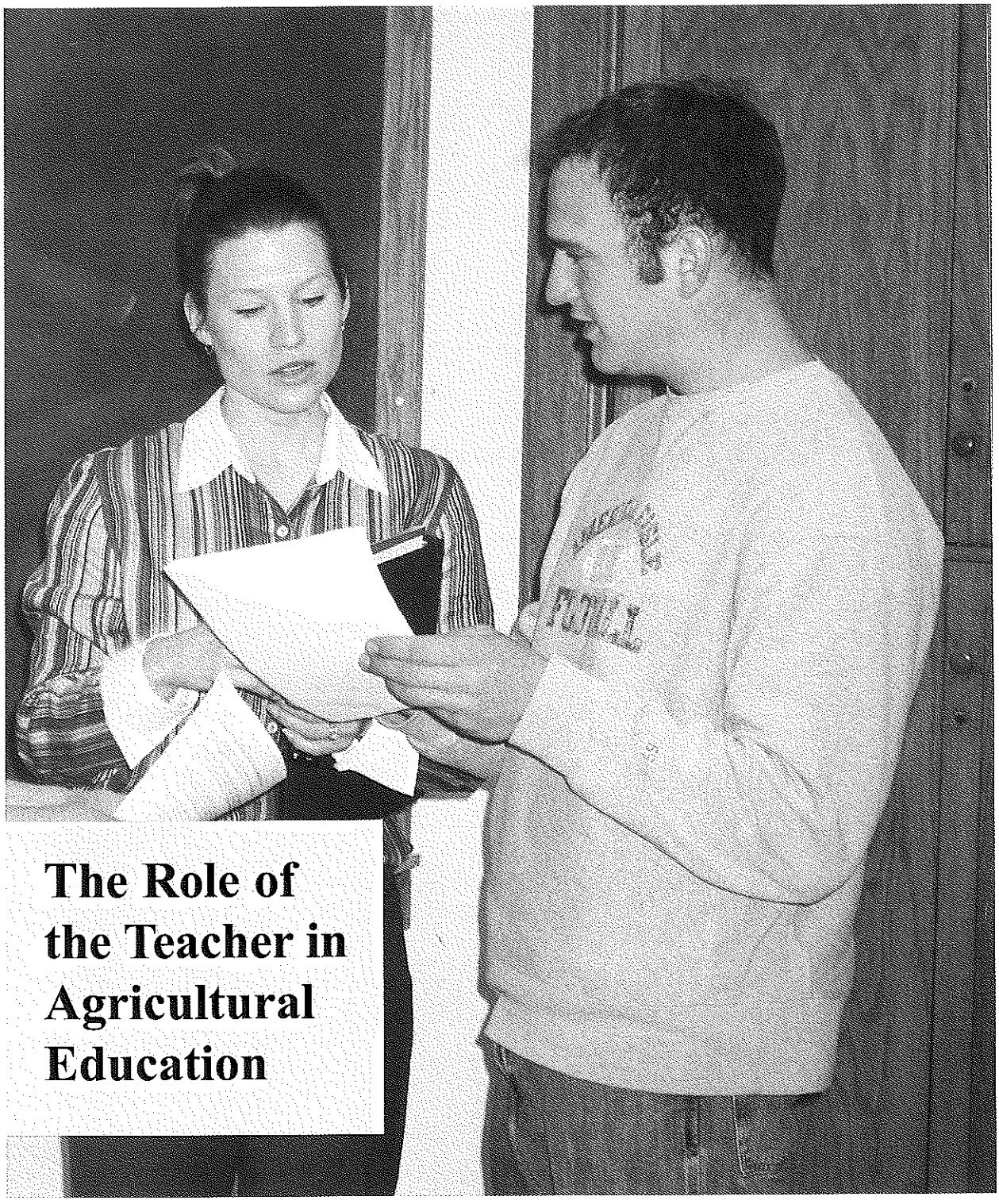

The Role of the Teacher in Agricultural Education

Re-Examining the Teacher's Role

By Robert A. Martin

For as long as I can remember there has been this quiet debate regarding the teaching and learning process. Is it "art"or "science"? Or is it both? I'm not sure agricultural educators have ever come to a definite conclusion to this debate and perhaps that's good. A good debate deserves an ongoing investigation into the various perspectives of an issue. This debate has direct implications to the role of the teacher in the agricultural education program.

I am torn by the perspectives regarding the art and science of teaching. Perhaps you are, too. My logical side says science is the perspective that should dominate. My humanity side says no, teaching is more than a science, it is more art.

Those educators who argue for the science perspective point out that there is a systematic approach that can be applied to all teaching and learning situations. They suggest we can reduce the teaching and learning process to a formula that, if followed, works in most, if not in all, situations. This perspective is supported by the appropriate use of the problem-solving approach to teaching and learning among other equally appropriate mechanisms.

On the other hand, those educators who believe the teaching and learning process is more art than science suggest that a set of human relation skills or approaches that focus on facilitation represent the true role of the educator. The use of these skills is not necessarily predictable and they are often situational. The various roles of the "teacher as artist" are played at various times and at a variety of levels.

When we combine the procedures of the "teacher as scientist" and the skills of the "teacher as artist", it may be appropriate to profile the role of the teacher of agriculture by using a new set of terms. These terms could include but are not limited to the following list:

* Organizer
* Connector
* Planner
* Affirmer
* Challenger
* Promoter
* Encourager
* Advisor
* Questioner
* Visionary

These terms may or may not adequately "define" the roles of the teacher of agriculture, but they do capture the essence of the variety of roles teachers must fill in order to achieve the goal of "whole person education" that is a hallmark of agricultural education.

As we think about the variety of roles the agriculture teacher serves, we have to realize that it is an awesome job, and not easily reduced to one formula for success. It is reasonable to conclude that "... the educator must possess both technical [agricultural and communication] and interpersonal skills to be an effective facilitator of learning. Central to the success of this approach are the personality characteristics, interpersonal and human relation skills of the educator" (Galbraith, 1990, p. 6).

Perhaps we do have an answer to the debate. Perhaps we know intuitively that there needs to be a combination of skills and approaches. The hard part is knowing the right balance. That takes experimenting and experience. Perhaps that is where the real debate lies. How do we more accurately analyze situations and apply our skills?

There is no debate about the views and experiences of our authors. Articles in this issue describe various roles of the teacher and how these roles can be enhanced. Read these articles and determine how the art and science of teaching can help carry out the many roles of the teacher of agriculture. Thanks to all the authors for sharing their work and a special thanks goes to Wade Miller for serving as our Theme Editor. Enjoy.

Reference

Galbraith, N.W. (1990). Adult Learning Methods. Malbar, FL: Krieger Publishing Co.

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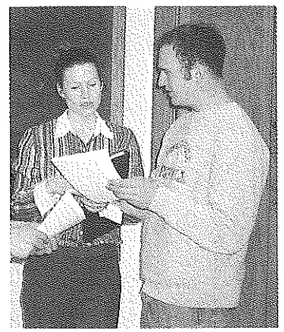
"... the educator must possess both technical [agricultural and communication] and interpersonal skills to be an effective facilitator of learning." (Galbraith, 1990, p. 6).

Theme: The Role of the Teacher in Agricultural Education

Authors writing for the January-February issue of The Agricultural Education Magazine look at the role of the teacher in agricultural education. Authors discuss how that role has changed, and what challenges teachers face today. (Photo courtesy of College of Agriculture, Iowa State University.)



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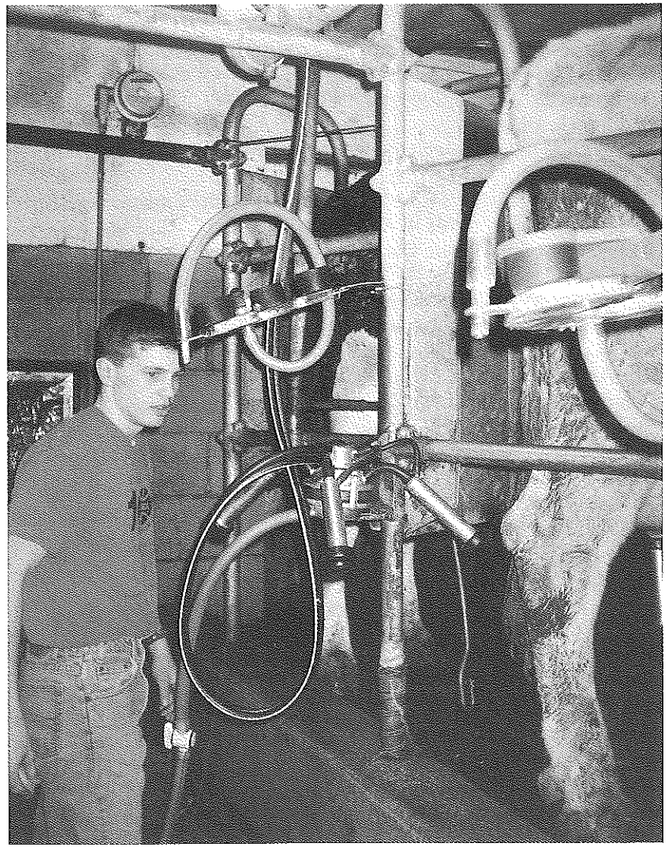
The Role of the Teacher in Agricultural Education

By W. Wade Miller

It is an undisputed fact that technological change is proceeding at a rapid rate. Agriculture, food, and natural resources are a part of this ever-changing environment. Does this increasing amount of technological knowledge affect the role of the teacher? Many teachers quickly answer this question with a resounding "yes". They support their answer with statements such as, "everything is more complicated than it used to be", "the pace of change is faster now than it has ever been", "the agriculture curriculum is much broader than it was a few years ago", "my students don't come from farm backgrounds", "I am teaching subjects that didn't exist when I went to college", and "about the time I learn something, it changes again". These teachers' concerns are real, but are they describing symptoms or identifying a specific problem? The role of a teacher has never been monolithic. It is tempting to accept the dictionary definition of teaching: to impart knowledge and skills. Most teachers realize that teaching is much more than that.

A very popular text used to prepare college teachers is Teaching Tips: A Guidebook for the Beginning College Teacher by Wilbert J. McKeachie. This book has been around in various editions since 1951. In the 8th edition of the book, McKeachie outlined six roles of teachers. These roles are the teacher as: expert, formal authority, socializing agent, facilitator, ego ideal, and person. All teachers perform these roles in varied ways. As an ***expert***, the role of a teacher is to transmit whatever information, perspectives, and viewpoints he or she deems important or necessary. As a ***formal authority***, the teacher is a part of an institution and serves as an agent of control and evaluation. As a ***socializing agent***, the role of a teacher is to clarify the goals and requirements of a particular field or discipline to students and to prepare students for that career path. As a ***facilitator***, the role of the teacher is to promote creativity and growth in students, to help them to develop their problem-solving skills, and to overcome obstacles. As an ***ego ideal***, the role of the teacher is to convey the excitement and value of intellectual inquiry in a discipline or field. And, as a ***person***, the role of the teacher is to lead by example, serve as a role model, to illustrate to students that work adds meaning to their lives and the lives of others.

Of the six roles listed above, maybe the one most adversely affected by technological change is the teacher as ***expert***. It is in this role that teachers express the most concern. Most teachers take a total



Miller lists six roles of the educator: expert, formal authority, socializing agent, facilitator, ego ideal, and person. He states that technology influences, but does not change, those roles. Mark Mueller, of the North Bend, NE FFA Chapter, is shown with his Supervised Agricultural Experience project.

of 12 to 15 agriculture, food, and natural resources course credits in college. Unless they have a considerable amount of experience outside the classroom, they are not experts in any area of agriculture. Student teachers and beginning teachers often try to overuse the expert role with their students through the lecture method. Perhaps they do this to "impress" their students. Maybe they do this because they have failed to develop a lesson plan for the topic. I have observed student teachers and beginning teachers "tell" everything they know about a topic to their students in 15-30 minutes time. Most experienced teachers know that their students aren't necessarily impressed by the amount of knowledge the teacher possesses and that students don't learn very much when they listen to long lectures.

The amount of knowledge in any particular field or discipline is growing exponentially. A teacher cannot expect to be an expert in all the areas of the curriculum in today's agriculture, food, and natural resources program at the secondary or post-secondary level. That does not mean that a teacher cannot develop a considerable amount of expertise in a subject, but to become an expert one must devote much of his/her life to that subject. Most teachers do not have the time and resources needed to dedicate their professional lives to a single subject. If you do experience a "calling", and decide to take action, then you will need to go back to college for one or more advanced degrees. Most teachers, however, do not feel the need to become experts in agriculture.

Of the six roles listed above, perhaps the one most positively affected by technological change is the teacher as ***facilitator***. The term "facilitator" is not without controversy among educators. To some this word is not very strong. It indicates to them that the teacher points the students to the subject matter and then lets them learn whatever they perceive as necessary. McKeachie, however, is using the word in a much more proactive way. The starting point is not necessarily facts and figures; rather it is relevant problems, concerns, difficulties, challenges, and situations. Students learn the subject matter and necessary skills as they solve these problems. In this role the teacher is very active in directing the learning process by providing the structure, resources, direction, and accountability needed for students to learn subject matter and skills in practical and applied situations. The facilitator assists students in their progress through the learning process. In one sense, the teacher who is good at facilitating learning is one who embraces the "learning by doing" concept of agricultural education. The teacher who is good at "facilitating" learning also emphasizes most of the other roles listed above.

By de-emphasizing the role of the teacher as expert and giving more attention to the other roles, the teacher embraces and employs changes in technology. The teacher often seeks out more professional development opportunities. The teacher often learns along with his or her students. The Internet becomes a source of information and ideas to address relevant problems. Students can work alone or in small groups to take on "Web Quests", to develop position papers, procedure guides, and to address many other problems. Students and teachers can use new laboratory equipment and meters in horticulture, aquaculture, or natural resource classes to perform tests and conduct experiments on the soil, water, and air. They can use specialized software and hardware to design almost anything from hog buildings, to greenhouses, to balance sheets. They can use other software to design brochures, write advertising copy, keep records, and develop business spreadsheets. They can use hardware and software to develop presentations and then deliver these presentations to others. They can use electronics to monitor grain quality or to adjust farm equipment. The applications of technology to address human needs and concerns become endless.

Has the increasing amount of technological knowledge affected the role of the teacher? Yes! If you have relied too much on the expert role, the pace and complexity of technological change may have rendered some of the knowledge you possess inaccurate, incomplete, or obsolete. Frustration and burnout may set in. If you have developed your skills and talent as a facilitator of learning and the other four roles of a teacher, then you probably have embraced technological change and look forward to what's next. Finally, maybe your roles will change over the years and technology will certainly play a part, but your purpose remains the same. It's a good idea to read the Ag Teacher's Creed from time to time to remind oneself why we do what we do. You'll find it on the Web at: http://www.naae.org/creed.htm.

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Motivating Students by Giving Them a Gap to Fill

By Breanne M. Harms and Neil A. Knobloch

The teacher's role as a motivator is more important today than it has ever been because students expect to be motivated in many external ways. It is important for teachers to develop a motivation in their students that is internalized. Teachers would agree that they want their students to be motivated to learn in the classroom, but the ultimate goal is to develop motivation that extends beyond the classroom. The purpose of this article is to provide a few techniques that agricultural teachers can use to motivate students to connect the classroom content to real world experiences.

Sharing knowledge with students in today's classrooms is not enough. Instead, teachers must find ways to build interest in the content and lead students to want to learn more about it beyond the classroom. Experts like, John Dewey (1938), have suggested the value of an "educative experience" to motivate students by creating a felt need through real-life, provocative experiences.

Teachers have the opportunity to motivate their students by developing an "out-of-balance" feeling by creating this felt need in their students. This can be characterized by simply giving students a gap that they *want* to fill, and hopefully, they will continue to try to learn until this gap is filled. By giving the learners a gap to fill, in the form of a felt need, teachers will find students engaged in the content, wanting to find out and experience more.

Gap Creators for Agriculture Teachers

Technique	Examples
Problem-based Learning	• Provide students with a complex case existing within their community. • Provide students with a complex case existing at the state, national or international level.
Interest Approach	• Conduct an experiment at the beginning of the unit, telling students that they won't understand the application until the week's end. • Open class with a current event relevant to the topic to be discussed and encourage the students to share viewpoints.
Closing Class	• End class with a statement like, "Tomorrow, we're going to find out how baby diapers relate to plant growth." • Pose a question to end class like, "For tomorrow, I'd like you to come to class and tell me why is agriculture going to go out of business?"
Real World Applications	• Bring in cuts of meat during a meats unit and give students the task of deciding the meat to be served for a backyard cookout for 5 friends on a $25 budget. • Bring in all the parts of an engine and lay them on a table. Ask the students what the part are and how they work. Then, discuss how the parts can affect an engine if they are not working properly.
Closing the Sale	• Place a value on the instruction if the students had not learned it in a classroom. "If you had to pay someone else to do this same thing (e.g. electricity), how much would it cost you?" • Stress to the students how the skill will make them more marketable.
Creating Tension	• Assign students to teams to take part in a class debate on GMOs. • During an animal science unit, hold an informal discussion on the costs and benefits of livestock production on the environment.

Figure 1: Gap Creators for Agriculture Teachers.

Techniques for Creating a Felt Need

Often, a felt need can be developed through student-centered teaching strategies, rather than simply focusing on delivering the content. The process of creating this gap may take more commitment from teachers initially, but they will find that the rewards will be far greater. Some or all of the following techniques (gap creators) can potentially be incorporated into the high school agricultural education courses either in place of current teaching methods, or as supplementary activities (Figure 1).

* **Problem-based learning** can by used by teachers through providing ill-defined real-world problems to the students, and allowing students to work individually or in groups to decide what path to follow, giving them ownership in the outcome. See the web site at *http://www.imsa.edu/center* for more information on problem-based learning.

* **Interest approaches**, used at the beginning of class, engage students to experience something without immediately understanding the educational significance. This "out-of-balance" feeling may also drive them to want to find out more. Although interest approaches are very common in agricultural education, they continue to be effective in creating a felt need to learn.

* **Closing class** by previewing the upcoming activities in an interesting way may leave learners engaged to think about the content until the beginning of the following day's lesson.

* **Real-world applications** of the content can create gaps that students might want to fill. The key to using this tool is to make sure the application is relevant to students. Also, using realia (real-life examples and visuals) tends to engage student interest to figure out applications, as well.

* **Closing the sale** by finding the needs of the "customers" may serve to spur student interest. By discussing what students will learn by the end of the instruction and finding out additional material that they want to know, teachers will help students "buy into" the classroom content and develop ownership in applying it outside of the classroom.

* **Creating tension** through contrasting views and ideas is another potential technique for creating a gap for students to fill. Discussing controversial issues will lead to engaged learners, as they will feel committed to their views, potentially leading to increased participation by students.

Motivating students in the classroom is one of the most rewarding and challenging tasks faced by teachers. However, in addition to extrinsic motivators including grades, praise, and rewards in class, teachers should strive to motivate their students intrinsically. By developing a desire *within* the students to learn the content to fill a gap, teachers are doing a great service to their students. Teachers will find that when they give their students a gap to fill, challenges will be accepted in the classroom and excitement or urgency will exist. Most importantly, however, students will be motivated, and by doing that, teachers are extending the value of education beyond the classroom.

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The Desire to Inquire Will Inspire

By Lee Smith

Many of us in agricultural education understand that earning a higher degree, though costly, will pay dividends after a long and rewarding career teaching agriculture. However, with the demands of teaching agriculture and advising an FFA chapter, a new teacher might perceive that there are enough limitations of time and resources to forgo this wise investment opportunity. I had these same beliefs early in my teaching career but decided to go back to school while working. Making that decision has been the best career move that I have made thus far. Now, I think it is one of my duties to try to convince other young agriculture teachers to seriously consider going back to the classroom.

When I began teaching I had high ideals; my expectations of my students were just as lofty and I felt that since I had earned my degree, my ticket to success, I was complete. Boy, did I get a strong dose of reality from my first teaching job. I thought that all of my knowledge and enthusiasm for agricultural education would mesh well with my students' willingness to learn, but it did not. Today, I am thankful for that. It would have been too easy if my first students had been as eager to learn as I wanted them to be. I would not have become the teacher I am now if I had not spent the first three years of my teaching career looking for ways to make what I was teaching more relevant to the students I was encountering in my classroom every day. This challenging situation forced me to think critically and become a learner myself.

While battling the daily challenges a new teacher faces and trying to develop a more attractive format for my lessons, I began working towards my master's degree. Initially, my motivation for seeking a higher degree was somewhat monetary but throughout the process I found my rewards to be completely intrinsic. As I began my course work, I started to reflect on how I felt being a learner again and I tried to apply my feelings to the planning for my students. The knowledge I was gaining in these graduate courses made me a more informed source of information for my students, of course, but cultivating their "desire to inquire" remained difficult.

As I continued to reflect on my roles as a student and as a teacher I began to understand that I was motivated to inquire, seek understanding and learn more because of this problem I had… the inability to make students see the relevance of what I was teaching. I began to hypothesize that if my students were introduced to an agricultural topic with a scenario of a plausible, real-life problem, their natural curiosity and their sense of wonder would motivate them to learn. I also thought that if my students were more motivated to learn then their satisfaction with the process of learning would increase.

During the latter stages of my master's program I was required to develop and propose an idea for my master's thesis. The thought of writing a paper longer than any most agriculture teachers wrote while earning their undergraduate degrees as well as the longest many of us will ever write is a strong deterrent to earning a graduate degree. This may be the very reason many teachers choose not to. But should we not expect at least as much of ourselves as we do of our students? Writing a thesis is a huge commitment of time and mental energy; however, that commitment will definitely sharpen any teacher's sense of what their students need. My proposal was not difficult to design. Through my reflections as a teacher and a student I had discovered something to investigate and test… would problem scenarios enhance the content of my lessons and motivate students to learn while increasing the students' satisfaction with the learning?

Expert support from my graduate advisor and the access to technology was key to my success. No one is expected to go through this process alone so with the Internet as a research tool and e-mail as a reliable feedback tool I felt very connected with the sources of help available to me. Through e-mail, I was able to keep my advisor current with my progress and his immediate feedback pinpointed my mistakes before they were compounded. With these resources, any inexperienced writer will be able to improve his/her skills and create a study of which to be proud.

While researching my ideas to establish a theory base for my study, I was very satisfied to find that many of the early educational psychologists thought the same things I did. John Dewey, for example, was convinced that education had failed because it tried to get students to learn solutions rather than to investigate problems and engage in inquiry for themselves (Lipman, 1991). There was very little empirical evidence, however, to support these theories.

I developed an animal science unit with two lessons, one for livestock diseases and another for plants poisonous to livestock. I began each lesson with the basic information about certain livestock diseases and certain noxious plants followed by a pretest to establish a base for the knowledge my students had obtained by traditional classroom methods. Then I divided my class into two groups: a control group that received the traditional knowledge enhancement of study questions and an experimental group that was given stories or scenarios of typical problems veterinarians, extension agents, agriculture teachers, farmers and ranchers might face from diseases or ailments of livestock. Each group experienced both the traditional and problem oriented enrichment activities. I alternated them after the completion of the livestock diseases lesson and before the enrichment of the poisonous plants lesson.

I noticed many actions taking place that differentiated the two groups from each other and these actions were not related to the personalities in the groups. The group with the study questions, for both lessons, quietly went about their work checking their notes and completing their questions. The problem oriented group, however, asked me more questions, observed more details that I did not realize I had included in their problems and seemed to be more involved in what they were doing. Some even asked for other resources to make certain of their conclusions. After the enrichment was turned in and reviewed, a post-test was given to see if any more knowledge had been retained followed by a five day delayed post-test to further establish any retention of knowledge. The scores on the tests, however, showed no significant difference between the two groups' learning for either lesson. After a survey, it was determined that the satisfaction with the lessons was no different between the two groups either. These results disappointed me but they also inspired me to look for reasons why my students did not learn more from a more realistic approach to teaching. I observed some good things that I could not measure and I knew that my devised method did accomplish something even if my data did not show it. I thought of more questions, better-constructed questions, by trying to answer just a few original questions. This made me a better teacher because it made me question all the things I had been doing and this inspired me to change my behaviors and constantly reflect on my methods.

Seeking a higher degree in education will pay dividends but the dividends may not be the ones originally sought after. This process will sharpen your skills as an educator; create a feeling of empathy for your students and, by trial and error, forge a personal pathway to understanding what it means to educate.

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Lee Smith is an Agricultural Educator at Mena Public Schools in Mena, Arkansas.

Smith advises other agricultural educators to consider higher education. He states that "this process will sharpen your skills as an educator, create a feeling of empathy for your students and, by trial and error, forge a personal pathway to understanding what it means to educate." (Photo courtesy of College of Agriculure, Iowa State University.)

Differentiating Instruction in Agriculture Education

By Tom Paulsen

On January 8, 2002, President George W. Bush signed the most comprehensive education reform act to date entitled "No Child Left Behind" (NCLB). If it was not already the case, this act will considerably increase the role of the federal government in the local educational system. Its impact will be felt in the day-to-day operation of each and every educator in this country—and Agricultural Education instructors will not be spared.

The NCLB legislation puts teeth into the accountability in education debate that has been running rampant throughout faculty lounges, coffee shops, and university Colleges of Education across this country. With its lofty requirement to have all students proficient in reading, math, and science by the year 2014, it is certain that not only will no child be left behind, but no teacher will be left untouched. With this new legislation focusing educators' attention on the achievement and improvement of all students, many might wonder how Agricultural Educators might be asked to change what they do each and every day.

Agricultural Educators are finding themselves sitting next to their academic counterparts in scientifically-based, professional development as required by NCLB. In hopes of increasing student achievement, the theory of individualization of learning has become a very popular topic in these current professional development training sessions. This phenomenon is commonly called differentiation of instruction. Littky and Allen (1999) contend that differentiating instruction for students is more than teaching the same material at various rates. It also means going beyond the core curriculum in different ways to respond to the needs of each student. Tomlinson (1999a) defines differentiated instruction for teachers as

> ...strive[ing] to do whatever it takes to insure that struggling and advanced learners, students with varied cultural heritages, and children with different background experiences all grow up as much as they possibly can each day, each week, and throughout the year. (p. 2)

NCLB is forcing many schools to take a deeper look at how the individual needs of student learners are to be met. Agricultural educators have always realized that every student learner is different and current educational research suggests that addressing these differences can be beneficial in the process of learning. Cuban (in Willis, 2002) contends that since student motivation is such a critical component in education today, anything that helps to engage students individually in their learning is important Brandt (2002) also proclaims that the students of today need less standardization and more diversification in their learning, while Levine (2002) explains that schools must concentrate on strong relationships, individualized study, and authentic experiences to make student learning more meaningful and enduring.

Agricultural Education instructors have had the benefit of utilizing the FFA and SAE components of a well-rounded Agricultural Education program to implement differentiated instruction for decades. Although the opportunity to differentiate instruction in the classroom component of the program might be as pedagogically new to an agriculture teacher as it is to a math or science instructor, our experiences with SAE and FFA provide us with the background we need to be successful in the classroom as well.

The most feared question any teacher ever gets from a student is, "Why do I need to know this?" Differentiated instruction, applied through a carefully thought out and developed action plan, can answer not only this question, but various others as well. Tomlinson (1999a) tells us that instruction can be differentiated based upon readiness, interest, or learning profile. Numerous students struggle when they are presented with classroom and theoretical problems. But when these same students are confronted with similar challenges in a hands-on or real-world setting, based upon their interests, they are able to not only figure out the correct answer, but they tend to retain the information much longer.

Much professional development has been done in local school districts in the areas of learning styles and multiple intelligences. Gardner (1993) maintains that students have eight intelligences, that include: verbal-linguistic, logical-mathematical, visual-spatial, bodily-kinesthetic, musical-rhythmic, interpersonal, intrapersonal, and naturalistic. Using differentiation to allow students to match essential learnings with a project that facilitates their strongest learning style allows students the best opportunity to retain that learning.

Individualizing instruction for each of the over 100 students many teachers see each day may not seem very practical. However, Sizer (1999) claims that it can be done. Tomlinson (1999b) states that to differentiate successfully, a teacher must know the direction in which he/she is headed. He/she must have deeply embedded into the curriculum an understanding of the essential learnings for the lesson, the unit, or the course. If students know that they are responsible for developing and demonstrating specific competencies, they are then given guidance and direction by their teacher to develop learning specific to their own readiness and interest levels. But remember, to be effective, every assignment can not and should not be differentiated. Tomlinson (1999a) reminds us that a teacher should be careful to modify an assignment only when he/she sees that the student has a specific need and is certain that the modification of the work will increase the likelihood that the student will better understand the important ideas and skills as a result.

For example, in an agriculture welding unit, each student is taught how to complete the technical components of welding using various technologies. It is up to each student, however, to demonstrate those competencies through an instructor-approved project. Scoring rubrics are given to the students to guide them through these essential learnings. It is up to the student and instructor, through a flexible partnership, to develop the project. Student learning styles and interests come heavily into play in this arena as well. A student who enjoys deer hunting might have a tremendous interest in making tree stands for his/her own hunting activities, while another student who runs a lawn-mowing business might need to design and fabricate a trailer to move lawn mowers. Allowing these students to plan, design, calculate a bill of materials, and successfully demonstrate their ability to weld in this project, demonstrates how a differentiated instructional activity can reach individual students interests, readiness, and individual learning profile, while increasing retention of the applied academic math and science skills.

Differentiated instruction can be implemented through other curricular areas and much research done in the area of gifted and talented education supports this notion (Berger, 1991). Consider all of the possibilities in implementing an agriscience research component to a traditional plant science unit. Students would be able to utilize their own interest areas to develop a research project that will demonstrate their aptitude in plant growth and physiology, biotechnology, or current industry issues as well as in the use of the scientific method, logical thinking skills and data analysis (Spencer, 2002).

Agribusiness students who develop marketing plans that include each of the components required by the National FFA Career Development Event utilize their own interest areas to demonstrate the essential learnings of the unit. Research by Caine and Caine (1994) contends that learning occurs only when curriculum is meaningful enough to the student that he or she decides to actively engage in the learning experience.

There is no question that the "No Child Left Behind" legislation will cause all educators to rethink how they facilitate instruction in their classrooms. Tomlinson (1999) tells us as educators that we should, "risk, stretch, [and] push a bit beyond the comfort zone" (p. 119). Differentiated classroom instruction, a new strategy to many teachers, might feel a little bit uncomfortable to us at first, but when we as teachers move out of our comfort zones for the benefit of students, learning can only be enhanced. As agricultural education instructors with practical experience in the differentiation of instruction, it is our responsibility not only to implement scientifically researched strategies in our own classrooms, but also to encourage and support each and every teacher in our local school building to do the same. In doing so, we will be playing a major role in assisting all students in our school in the process of learning. And isn't that really why we go to work each day?

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The Role of the Agricultural Educator in a Culturally Diverse Society

By Anna Ball

"Ain't what it used to be."

Although a bit eccentric, this quote by Yogi Berra serves as a humorous reminder of the many changes in agriculture, in education, and in society in general. The list, below in Figure 1, published by the Institute for the Transfer of Technology to Education (Bailey, Lumley, & Dunbar, 1995) represents some compelling facts on the nature of change for the 21st century.

This list elicits some interesting thoughts on the nature of change in agricultural education, the role of the teacher and how that role has changed, and the challenges associated with meeting rapid changes and preparing for a future that Yogi Berra so poignantly says, "Ain't what it used to be."

Perhaps one of the biggest changes and thus challenges to teaching agricultural education in the new century is the fact that students have changed. In fact, the demographics of the United States population as a whole have changed. The 2000 Census (U.S. Census Bureau, 2001) reported that while 75 percent of the total U.S. population was white, non-Hispanic and 25% of the population comprised the other ethnic groups (including Black, Hispanic, American Indian, and Asian/Pacific Islander to name a few), a total of 65% of the nation's school age children were white, non-Hispanic with the remaining 35% comprising minority groups (U.S. Census Bureau, 2001). The U.S. Census Bureau (2001) projects that by the year 2040, there will be no ethnic majority group in the United States. Further, roughly one-fifth of school age children speak a language other than English at home and 39% of students live at or below the national poverty line (U.S. Census Bureau, 2001). Racially, ethnically, and economically, today's students are very different from past populations and they continue to change at a rapid rate.

Present and Future Change

1. Every two or three years, the knowledge base doubles.
2. Every day, 7,000 scientific and technical articles are published.
3. Satellites orbiting the globe send enough data to fill 19 million volumes in the Library of Congress – every two weeks.
4. High school graduates have been exposed to more information than their grandparents were in a lifetime.
5. Only 15 percent of jobs will require college education, but nearly all jobs will require the equivalent knowledge of a college education.
6. There will be as much change in the next three decades as there was in the last three centuries.

Source: Bailey, G. D., Lumley, D., & Dunbar, D. (1995). *Leadership and technology: What school board members need to know.* National School Boards Association's Institute for the Transfer of Technology to Education. VA: Alexandria.

Figure 1: Present and Future Changes

Not only are today's students more diverse demographically, they also differ greatly from their instructors in mindset. Each year, Beloit College in Wisconsin publishes a Mindset list to inform college and postsecondary educators about the "mindset" of their entering freshmen. This list can inform both secondary and postsecondary teachers regarding how greatly students differ from themselves.

For example, according to the Beloit College list for the graduating college class of 2006 (Mindset, 2002), this year's entering freshmen (or last year's graduating high school seniors), had their mindset shaped by the following from a list of 50 facts: "A Southerner has always been President of the United States; South Africa's official policy of apartheid has not existed during their lifetime; Cyberspace has always existed; George Foreman has always been a barbecue grill salesman; the U.S. and the Soviets have always been partners in space; males do not carry a handkerchief in a back pocket. Ozzy's lifestyle has nothing to do with the Nelson family; and genetic testing and DNA screening have always been available." In reflecting upon this list, how do your students differ from you in mindset?

Research provides us with some guiding principles for addressing diversity in our classrooms. According to theories of culturally relevant teaching (Ladson-Billings, 1994), culturally relevant teachers know that: when students are treated as competent they are likely to demonstrate competence; when teachers provide instructional scaffolding students can move from what they know to what they need to know; the focus of the classroom should be instructional; real education is about extending students' thinking and abilities; and finally, effective teaching involves in-depth knowledge of both the students and the subject matter.

Perhaps in agricultural education we've practiced this all along. Instead of culturally relevant pedagogy, we've titled it, "Making a Difference." As agricultural educators, it's important to reflect upon current research that informs us as well as our own thoughts and beliefs that guide us. Regardless of the label, culturally relevant, characteristics of effective teaching, or even making a difference, it is important to focus and reflect upon how we have adapted and continue to adapt to the changing needs and diverse backgrounds of our students.

As an educator, a manager, and a program leader, are you culturally relevant? Do you know and relate to the diverse backgrounds, the needs, and the mindset of all of your students? Is your program interesting and applicable to a diversity of students or does just one "type" of student enroll in your classes?

In short, today's students are different. They grew up differently, they think differently, and they are more diverse than their teachers in a variety of domains. As we progress toward becoming a nation where there will be no dominant culture, diversity impacts agricultural educators, even in programs that don't currently appear diverse in terms of racial demographics. In addition to the differences in mindset that occur with all generation gaps, in agricultural education, more students are female, more are racially and ethnically diverse, and more are labeled with special needs. One of the major challenges for teaching agriculture or any other subject in the 21st Century is adapting to the diverse needs, interests, and backgrounds of our students, and ensuring that our programs are "relevant", culturally and otherwise, for all students.

Ball states that today's students grew up differently, think differently, and are more diverse than their teachers in a variety of domains. Additionally, the demographics of the United States population as a whole have changed. Ball encourages educators to "reflect upon how we have adapted and continue to adapt to the changing needs and diverse backgrounds of our students." (Photo courtesy of College of Agriculture, Iowa State University.)

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Partnering for Teacher Success

By Dave Grunklee

From row width based on the size of the rear end of a horse to hybrids genetically developed for row width… "bumping" calves to ultra-sound… wire-guided planters to satellite guided tractors…counting bull progeny to counting boar sperm...planter plates and gear adjustment to variable rate planting. Agriculture has experienced many advances in technology and science.

From chalk boards to smart boards...yield checks to yield maps…soil science to hydroponics…designing and constructing sawhorses to designing and constructing landscapes…soil survey books to digitized soil mapping. Agricultural Education has also changed. In fact, one of the hallmarks of agricultural education has been the ability to teach what is new and relevant to our students.

Challenges

According to the text Methods of Teaching Agriculture (Newcomb, McCracken, Warmbrod, 1986), there are four objectives of instruction in agriculture:

* develop avocational and practical arts interests, knowledge and skills
* provide exploration of and orientation to occupations requiring knowledge and skill in agriculture
* develop knowledge and skill for occupational competence
* prepare for more advanced study of agriculture

As career/technical instructors we understand the emphasis on the exploration, skills, and knowledge that is inherent in these objectives. As agriculture has changed we have changed with it. In a previous issue of The Agricultural Education Magazine, Case and Whitaker (1998) expanded on the National Goals of Agriculture Education as outlined in the *Strategic Plan for Agricultural Education*. The very first goal: "To update instruction in and expand programs about the food, fiber, and natural resource system" reaffirms the fact that technology and curriculum content changes must take place in order for a program to succeed. Herein lies the problem. According to White (1993), "As human beings, teachers tend to teach what they are familiar with and enjoy." This presents the challenge that faces many instructors—**how** to develop this familiarity and enjoyment of new topics.

The agricultural producer has had to adapt and learn to efficiently use and utilize the new technology as it comes along. The agricultural educator also has the need to learn, understand, and develop teaching strategies for these technological advancements. Whereas, the producer has the ability to attend industry sponsored, free or inexpensive field days or training sessions that occur during the day in the off-season (winter), the modern agricultural educator has no real *off-season*. Our "off-season" is in the summer when conflicts with officer trips, county fairs, professional conferences, and career development events occur. It is also an opportunity to spend valuable and much needed time with family members and relax. Many instructors will also be taking courses that will move them along their salary lanes and toward a higher degree, but these may not offer the opportunity to delve into something new or hands-on. So the educator needs to:

1. find time to take the training
2. take training that will give credit that can be used for relicensure
3. take training that can be applied to classroom situations
4. take training that is inexpensive.

Partners

This is where community colleges and vocational/technical institutes can help. By their nature as occupational preparation institutions, these schools should have advanced technology and labs that can offer the agricultural instructor an opportunity to develop skills and applications for use in building or updating curriculum. Here at Hawkeye Community College (HCC), and at others across the country, many of our instructors have a background in teaching at the secondary level. We know the challenges of keeping abreast of new material. Three instructors here at HCC developed a plan to aid in this problem. Our plan has three components to disseminate the information to secondary school instructors:

1. one day or less in-service programs on campus;
2. multi-day workshops on campus; and,
3. short workshops at different locations.

A brief description of each component is as follows:

1. Hawkeye Community College has offered in-service programs in conjunction with State Department of Education meetings. The teachers in this district of the state attended a state called meeting for part of the day and then we added a hands-on in-service for the rest of the day. We have provided training in combine operation, GPS equipment operation, golf green development and maintenance, use of ultra-sound technology, prairie plant identification and native seed harvesting, golf course equipment operation and maintenance, soil characteristics, and computer aided landscape design. The emphasis of this training is to whet the appetite of the instructor and get them familiar with the topics. Many times some of their students are already working in this area and this gives the teacher the opportunity to identify with what the students are experiencing.

2. We have also offered multi-day courses on various topics. This past summer we secured a grant from the Agknowledge Center to offer a workshop with three components that would give credit toward Iowa teacher re-certification. If the participant chose to do a curriculum component a local university would grant graduate credit. Since we are located in the NE part of the state, this provided an opportunity for teachers from this area to take relevant coursework for credit without having to travel a long distance.

The workshop was open to 18 participants and set up in three rotations of six "students" each. Each rotation was designed to give the participant hands-on instruction and real-world application of industry-used technology. The three components offered at this workshop were in the areas of: turf management, agronomics, and GPS/GIS technology. Our Center for Agricultural Science Education (farm lab), horticulture lab, and agricultural computer lab were the areas that these sessions took place. Each participant had to participate in all three rotations and complete an action plan to receive credit. Each rotation lasted 8-9 hours so the workshop was completed in 5 days.

Participants were given an opportunity to operate or implement the technologies being focused on and teachers were able to develop strategies that they could take home and use right in the classroom. We have also provided industry training on different subjects. This coming summer we are offering a series of 2-3 day workshops to build in some flexibility for the people attending.

3. Instructors from the Agriculture and Natural Resources department also will travel out to schools and workshop sites throughout the state with mobile lab activities that can provide secondary instructors and their students with information. Some of these mobile lab activities have included turf management, GMO testing, and GPS use.

Summary

These activities are ways that community colleges and vocational/technical institutions can help agricultural educators receive much needed training. It is a win-win situation for all. The community college/institution can get exposure of their programs to a wider audience and the secondary instructor can get new information for developing/updating curriculum. Powers and Powers (1993) wrote, "the teacher's knowledge base of agriculture serves as the basis for planning, developing, and implementing the local agriculture program." As agriculture changes, the agricultural educator must expand his/her knowledge base to keep the local program from stagnating. The local community college or vocational/technical institution has the opportunity to take a lead role in aiding in this expansion. We just need to take it.

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Upcoming Theme: March – April Issue

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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Don't Forget to Dance with the One Who Brung You

By Gary Moore

There is an old cowboy saying that says don't forget to dance with the one who brung you. This homily is good advice for agriculture teachers who are under increasing pressure from all the educational reform initiatives and other external pressures. This author has been actively involved with agricultural education as a teacher or teacher educator since 1969 and has seen a plethora of reform movements come and go. During this 30+ year span I have observed that the enduring key to having a successful agriculture program is to dance with the one who brung you.

We must not abandon practical, hands-on teaching. Public school agricultural education emerged in America during the early decades of the 20th century. There was widespread dissatisfaction with the existing educational system with it's over emphasis on the classical subjects and rote memorization. There was a need for a more practical type of education that was geared to the needs of society.

An article in Hoard's Dairyman in 1895 stated that education is "as it was 60 years ago in our boyhood, so it is today in 99 out of 100 schools. Not a grain of progress that will help the country boy to a better understanding of the problem of agriculture."

Wallace's Farmer (1908) was more emphatic in its denunciation of the educational system, stating that we need to abandon "the cut-and-dried formula of a period when a man was 'educated' only when he knew Greek and Latin".

When agricultural education emerged in the early 1900s, it was a welcome breath of fresh air. The teaching of agriculture was characterized by practical, hands-on activities - a far cry from the boring, insipid education that had little connection to the real world. Students were actively engaged in learning practical information they could use in their communities.

Today there is an emphasis in many states to make agricultural education more academic. In North Carolina there is even a slogan "Career and Technical Education: Its Academic." There is nothing wrong with high standards and requiring the best effort of our students; however, we must be diligent not to swing too far out on the "academic" pendulum.

Some professionals in career and technical education believe agricultural education and other traditional career and technical education fields should embrace the high stakes "paper and pencil" testing movement just like our academic kindred. This is a huge mistake for several reasons:

- Rarely can a "paper and pencil" test measure psychomotor skill development. Just because a student can answer questions on a test about welding doesn't necessarily mean the student can successfully weld. Much of what we do in agricultural education is geared at psychomotor skill development.
- Technology changes so rapidly in agriculture that it would be next to impossible to keep the tests up-to-date.
- Agriculture is so varied from state to state, and even within states, it is difficult to construct a test that would accurately assess student knowledge of agriculture.
- Teachers would start teaching the test. We would return to a pre-1900 era of education where seat-time and rote memorization were the norm.

Teaching practical, applied knowledge that often involves hands-on learning has brought agricultural education to the pinnacle where it is today. This is one dancing partner we must not forget.

We must stay in touch with the community. The worth of an agricultural education program is determined at the local level. The decision to close a program or add additional teachers is made at the local level. The state can pass all types of rules and regulations but it is the local folks who determine if an agriculture education program is good. Therefore, agriculture teachers need to be operating a program that meets the needs of the local community.

The curriculum should reflect the needs of the community. While we should make our students aware of global issues, biotechnology, and other current trends and issues, we cannot forget where they live. Educators involved in international development quickly learn that the success of their efforts is often directly tied to adapting programs and technology to local customs and norms. The same is true domestically. Our agricultural education programs must first meet the needs of the local community.

Having community based agricultural education programs has been one of the guiding precepts of agricultural education since its early inception. Because of the information explosion, school consolidation and increasing involvement of state and federal government in education in more recent times, we may have forgotten the importance of this precept. We need to remember that our communities brung us to the dance; not some educational bureaucrat in the state department. I have never seen an agricultural education program with strong community support in danger of closing.

We must focus on teaching the best and brightest students. One of the hallmarks of the agricultural education program has been the quality of students in the program. People are constantly amazed at the leadership skills, maturity and work ethic of the students who complete our programs. While many agricultural education programs still have high quality students, in some schools there has been an erosion in the quality of the students. Dare I say a few programs have literally become dumping grounds? How did this happen?

After the Smith-Hughes Act was passed in 1917, a Federal Board for Vocational Education was established to administer vocational education. Shortly thereafter, the Federal Board published Bulletin No. 1, which contained general guidelines for operating vocational programs. In describing the population for vocational education the Federal Board (Bulletin No.1, 1917, p. 17) stated, "The Federal Board desires to emphasize the fact that vocational schools and classes are not fostered under the Smith-Hughes Act for the purpose of giving instruction to the backward, deficient, incorrigible, or otherwise subnormal individuals…" This statement left little doubt about which students should be in vocational education.

The pendulum started swinging in the other direction in the 1960s and 70s. Federal legislation mandated that specific amounts of vocational funding be spent on special populations. This federal mandate continued with the Carl Perkins Act of 1984. Because of these legislative mandates, school administrators and the general public started believing that vocational education was primarily for special population students. This mindset still exists in many schools today even though later legislation relaxed the emphasis on special populations.

There is nothing wrong with having special population students in agricultural education. However, there must be a balance. The proportion of special students in agriculture classes should be proportionally the same as their population in the school. Agricultural classes should not be a dumping ground. In order to prevent agricultural education from being a dumping ground, agricultural teachers have a responsibility to have high standards and expectations and offer a sound, quality program of agricultural education. This will attract the quality student.

There are those who believe an agriculture teacher will attract the type of student he or she deserves. If a teacher is conducting a slack program, then this is the type of student that should be expected. Agriculture is important to the future of our nation and needs highly capable individuals to lead us into the future. We need to remember that quality students are the ones who have helped build the enviable reputation enjoyed by agricultural educators. We need to be dancing with these students.

If agriculture teachers will focus on using a practical hands-on approach in their teaching, stay connected with the community, and operate a quality program that attracts talented students, the future will be bright for agricultural education. These three are the ones who brung us to the dance.

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Upcoming Theme: May-June Issue

The Role of the Teacher in Conducting Supervised Agricultural Experience Programs (SAEP).

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 for enhancing the teacher's role in conducting SAEs?

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Changing the Teacher's Role in Teaching Through Problems

By Sheila Settle and Neil A. Knobloch

The role of the teacher in agricultural education has been known as one who helps students solve problems. However, the nature of problems that agriculture teachers use has been evolving from well-defined, structured problems with concrete solutions to complex, messy, ill-structured problems with many possible solutions. Consider the following problem.

> **Problem 1:** Jane has some of the best-looking corn and soybeans in the county. She decides to make an application of Round-Up to her Round-Up Ready soybeans approximately 6 weeks after planting. The day she planned on spraying was fairly windy, but she went ahead with her plans. Later, the first few rows of a cornfield that borders her soybean field start to yellow, wilt, and die. What has happened to Jane's beautiful corn?

The above example may be a bit simplified, yet it paints a picture of the type of problems that are often used in agricultural classrooms to teach students to solve real-world problems. While Problem 1 may occur from time to time in the real-world, as adults, we know that real-world problems are much more complex and much more deep than an example of this sort. If teachers want to develop their students to solve real-world problems, they must learn how to move students beyond their current level of thinking (Lancelot, 1944). One of the most beneficial things teachers can do for students is to teach them how to think broadly, yet deeply about the content (Newmann & Associates, 1996). In agricultural classrooms, the role of the teacher should be to extend students' thinking by giving them ill-structured, real-world problems to solve.

The component of a problem that determines whether or not it is "real-world" is this aspect of it being ill-structured. The four main characteristics of an ill-structured problem are: (1) the problem is messy, complex in nature, and contains several layers; (2) the problem requires questioning, gathering information, and reflection; (3) the problem is changing and tentative; and, (4) the problem does not have a simple or fixed solution, and it cannot be solved with the application of one specific formula or action plan (Illinois Mathematics and Science Academy, 1998).

If a problem contains these characteristics, it will most likely mirror a real-world problem. Students who are exposed to real-world problems are challenged to become active seekers of solutions. Their thinking is extended as they examine many possible solutions to the messy problem. Going back to Problem 1 mentioned earlier, one can see how it limits students to extend their thinking. The problem is uni-dimensional and has a fixed solution. Of course, the students may utilize valuable knowledge and experience to arrive at that solution, but at what level will students be thinking? Chances are that students who are continually exposed to simplified problems will have difficulty in applying what they have learned to real life problems they may later face. Why? The problems they will face in the real world will be ill-structured and require creativity, with the ability to think beyond easily identified solutions.

Perhaps a better real-world problem than the one mentioned at the beginning of this article would look like Problem 2. This case is just one example of an ill-structured, real-world problem that could be used to extend students' thinking. As the problems have more than one solution, so there are many ways to find these problems and incorporate them into a classroom.

> **Problem 2:** It's spring planting time. Jane's crop plan includes for one-half of the 80 acres surrounding her house to be planted in corn. The other half of the field will be planted in soybeans. Jane has two neighbors who live within a quarter of a mile of her acreage. Her neighbors have threatened to call the Department of Natural Resources if they suspect any practices that may be harmful to the environment. Based on sound environmental practices, what varieties should Jane plant? What type of weed management program should Jane follow that compliments her growing situation?

As an example of problem-based learning in agricultural education at the University of Illinois, preservice teachers were engaged to make decisions using ill-structured problems. The preservice teachers received six ill-structured problems involving inappropriate behaviors by agricultural education students in the FFA. These incidents of misbehavior were real-life and involved several factors that needed consideration. The ill-structured problems involved drug and alcohol use on a camping trip, sexual activity in a motel room, theft on a field trip, a violation of good conduct policy, academic ineligibility of the chapter president, and horseplay on the school bus at a convention. The preservice teachers used a model of decision-making (Hoy & Miskel, 2001) to develop criteria for deciding upon an acceptable solution to the problem. Then, they analyzed their particular ill-structured problem and developed 17 alternatives for addressing the misbehaviors. After developing the alternatives, the preservice teachers selected only those alternatives that they believed would be appropriate based on their criteria for an acceptable solution. Then, the preservice teachers wrote a "bad-news" letter to the parents of the students who misbehaved, which told the parents what happened and what actions were taken or would be taken.

Throughout the problem-based learning experience, the preservice teachers had to wrestle with the thought of uncomfortable situations of this sort in the future. Developing solutions that met criteria for acceptability extended their thinking. Eighty-six percent of the preservice teachers agreed that they were more prepared to deal with student problems as an FFA advisor than they were before they studied their ill-structured problems. Ninety-five percent agreed that the problem-based learning experience engaged them to think reflectively, and all preservice teachers said the ill-structured problems engaged them to think of creative alternatives.

Teachers can draw on their own experiences, as the professor did in assigning the ill-structured problems to the preservice teachers. The key to problem-based learning is developing good ill-structured problems that engage students to wrestle with real-life situations. A website that provides teachers with problems to use in their classrooms and information on how to use problem-based learning is located at: www.imsa.edu/center.

As teachers incorporate real-world, ill-structured problems into their classrooms, they will find that their students are challenged and strengthened to grow in creativity. Ultimately, teachers will have enabled students to extend their thinking in new and exciting directions in preparation to solve real-life problems.

Teachers will have enabled students to extend their thinking in new and exciting directions in preparation to solve real-life problems.

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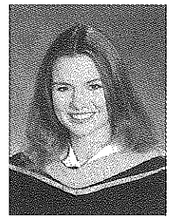

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Technology: Out with the Old, In with the New?

By Michael D. McDermott

Imagine walking through an agriculture shop/laboratory only to find the table saw is missing. The radial arm saw is stacked high with debris and covered with a year's worth of dust. Further investigation on your part finds the arc welders are gone, vanished and the small engines are piled in a corner covered with a layer of dust. You begin to wonder "what is happening in this agricultural mechanics lab?" Ahead, you can hear a faint noise that grows louder as you walk on. It appears that a class is being taught inside the room that you stand next to. Not wanting to interrupt the class but also wanting to satisfy your curiosity, you open the classroom door and find several students working with computers. The teacher is actively moving about the computer lab assisting the students as they require it. The teacher approaches and asks "may I help you?" Your reply to the teacher is "what are you doing here?" The teacher proceeds to explain that you have just seen a hydraulics class/lab working with a CD-ROM disk. The students are calculating pressures, force, and area of various hydraulic system components. "What happened to the wood construction, welding, and the small engine class" you ask? "We do not teach that "old" technology anymore" came the teacher's reply.

While the above scenario is a hypothetical situation, it is one that teachers of agriculture must face as they answer the questions of what to teach and how do they infuse the technological advances in the industry of agriculture into their curriculum. Career and technical education has a technological dilemma. That dilemma is the gap between the so called "older" technology and the "new". For example, programs can produce students that can design a project with CAD, but do not know how to use a crosscut handsaw. This technological expanse is not unique only to career and technical education. This technological dilemma exists within the academic side of education. An example is that general education or academics can produce students that know how to do great feats with or on a computer, but the same students may not have command of their basic math multiplication facts. Nearly all teachers face this same common problem on a daily basis as they plan and prepare their lessons. It can be easy to simplistically define the problem but solutions to deal with the problem can be more difficult to define and implement. How you as an individual teacher address this technological dilemma will help define your success as a teacher of agriculture.

A common mistake we often make as educators is to categorize things and thus put a stigma on the categories. "Old" versus "new" technology, what stereotype is attached to each category? Old technology must be of less value than "new" technology and needs to be diminished in your curriculum. Ponder that point as you drive home from work in a vehicle that still uses some of that "old" technology. The engine in your vehicle operates on the same basic principles that the first internal combustion engine operated on, carburetion, compression, and ignition. Technological advances have given car owners fuel injection, solid-state ignition, and computerized control modules. These advances appear to be quite complicated until they are broken down into individual systems and components so the students can understand them. Students need to see and understand the connections between the "old" and "new" technology and how technology has advanced and created the "engine" (or any other number of topics), that we use today. Don't be afraid of being caught teaching the "old" technology, just be sure to include the "new" technology that is associated with it.

As a teacher you are justified in your concern about teaching the right subject matter to the students and technology being infused into the curriculum. The agricultural education teacher should not grapple with this question alone. Involve others to help answer the question of what to teach and how it is best taught. Look to the agricultural education program's advisory committee to be the eyes and ears in the local agriculture industry and the broader community. The advisory committee members should represent the agricultural community and provide the teacher and the school with recommendations as to the direction the agricultural education program should take. The committee members should also offer some insight as to what sort of technology levels are being used by the agriculture workforce and how the curriculum can prepare students to meet those demands. Graduates of the agricultural education program can also provide valuable information. Former students should be able to indicate what part of the curriculum they have found to be very beneficial to them in their current profession whether it is part of the agriculture industry or outside of it. Graduates can also indicate the technological skills they had upon graduation and the skills they needed to have or have developed in order to achieve successful employment or continuation of their education. After the input has been received from the advisory committee, graduates, and the teacher's own observations/ research, the difficult job of evaluating the agricultural education curriculum begins. The evaluation should focus on how well the program and curriculum is preparing students to succeed in today's technological society.

The findings of the evaluation may indicate the need to "update" the curriculum. The question now becomes how does one implement the changes and infuse the technology of the agriculture industry and prepare oneself to teach it? Start by preparing a list of technological items that is felt would be needed to improve the program's curriculum. The teacher will, most likely, not be able to obtain everything on the list, but each year obtain more items from the list. If the teacher does this it will insure that technology is being infused into the agricultural education program. Realize that the list will, most likely, never be exhausted. For the technology items that a program cannot afford to purchase, make alliances with businesses or industry people that can help bring the technology to the program or take the program to the technology. Field trips and resource people are still viable learning activities that can allow students to be exposed to more than what the local resources can provide.

If the teacher finds that he or she needs to be updated to know more about the technology they wish to teach in the curriculum, identify the want or need and then find the training. Agriculture businesses are often willing to provide training. John Deere, Briggs and Stratton, and Lincoln Welding are three in the mechanical area that provide various teacher training workshops. Textbook publishing companies will often provide in-service training, especially if a voice for the agriculture teachers requests it. Let the state staff or university faculty know what type of training is needed and they can help. Most importantly is to take advantage of the training. The training will help the teacher and if the training sessions are full, the sponsors of the training will feel that they have served a vital role and continue to provide future training for future needs.

Keeping up to date with technology is a continuous effort. It is not easy and at times will feel impossible when funds for purchases are insufficient or time for professional development is short. YOU, as the classroom teacher, help establish the program goals and priorities. If technology is a priority, then teach the important "old" and infuse the identified "new" technology and then prepare yourself to teach it. Good luck, because it's a tough job!

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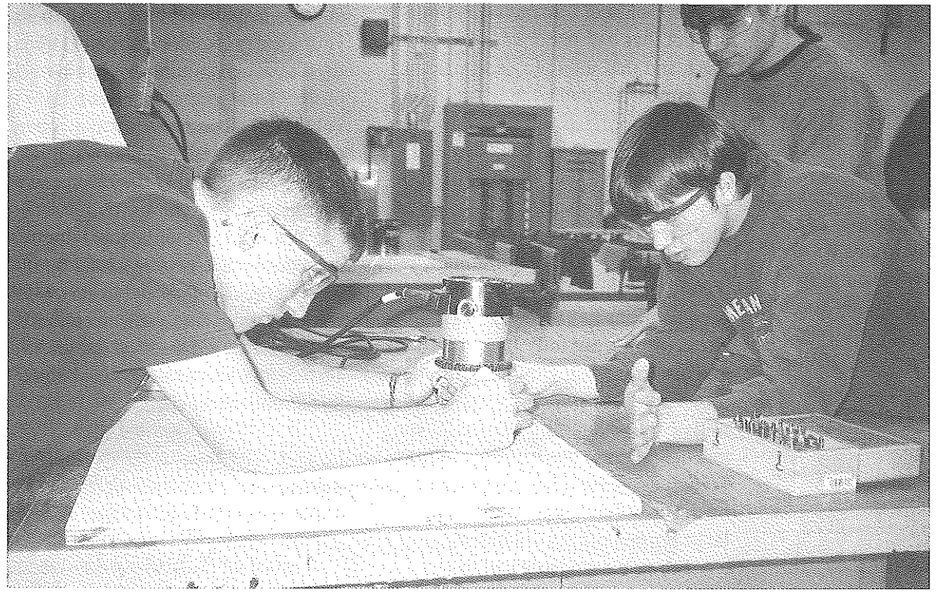

McDermott encourages educators to "teach the important 'old' and infuse the 'new' technology" in making technology a priotiry in the curriculum. Roland-Story, Iowa agricultural education students are shown in the agricultural mechanics laboratory.

The Role of a First Year Teacher

By Patrick Wellert

As a first year teacher, I do not claim to know everything. My first few weeks of teaching were extremely challenging and after the adjustment period, I am becoming more comfortable, not only in the classroom but on other excursions related to our profession. Now don't get me wrong; there have been a lot of adjustments and things that people would call negative experiences but you just have to look at them as learning opportunities.

The first of these learning opportunties, and the most powerful, is the SAE visit. At the university they could not stress this enough; when you visit a student and take interest or have them teach you a certain skill they are doing, the mutual respect between you grows immensely. Whenever I have a student that is giving me problems in class, the first thing I do is schedule a SAE visit. After the visit I would occasionally ask the student how their project and more importantly their family was doing. When the first visit is complete, you will likely see a change in the student's behavior in class. My best students are those who I have gotten to know outside the school environment.

Participate in FFA events and bring as many students as you can with you. A great way to grow interest in an event and even grow future leaders is by exposing them to conferences, workshops, contests, and other leadership activities. When a freshman is able to see a public speaker at an event, turn to me, and say I want to do that next year, I get excited and reassured that the power of seeing your peers try to succeed encourages others to get involved.

Classroom management is the key to having a successful first year. The most important thing you can do is being successful in the classroom.

Have a strong curriculum in place. My first few months have been a breeze and helped me become more comfortable in the classroom because I am teaching units that I acquired and familiarized myself with while student teaching.

In discipline be "firm but fair", always stick to your word, and follow through. From the first day forward, you will lay down a set of rules and the students will test them. Always be firm with the rules and do not play favorites. Reinforcing the positives will help to gain an excellent rapport with the students. A simple "Great Job!" means the world to them.

Work with your administration and school staff. I have been blessed with an awesome, supporting staff that has been able to handle every question I have had. If you do not know, seek out someone and ask. Also, call your fellow colleagues especially those first or second year teachers who have similar situations as you. You will find out that things are not that bad once you speak with them and that they are experiencing the same trials and tribulations as you. Do not be afraid to call teachers that are more experienced and have them give you a boost. Both of these steps are excellent ways to get motivated to further your program.

Have an advisory committee and get alumni support. Having these two organizations has helped to take stress off me, not only for curriculum and discipline but within the community. Countless students went home initially complaining about the "mean" teacher. Having these people in my corner, assuring other parents and businesses that I was "ok", took a large burden off my shoulders.

Enjoy the students and their energy. We chose secondary education because we see the opportunity to make a difference at this stage in a student's life. When presenting a new lesson be enthusiastic. Even though some students may not respond in class, they will remember and become excited about your lesson. They will also discuss and think about the concepts outside of class. I also enjoy visiting students at their non-agriculture events. Showing students that you care about them and not just their involvement in agriculture is important.

Finally, I believe that the role of a first year teacher is more than just that of one who sits back and observes. During your first year you are filled with fresh ideas and an immense knowledge of students and their needs and wants. Get out and try new things, whether it deals with classroom management, class projects, or experiments in the greenhouse. No one will blame you for trying; just follow through. Challenge the experienced teachers at CDE events, become active in your local professional organizations, try a new agriculture mechanics project with your students, and volunteer to become active in your communities and the school's other organizations. Enjoy the chance at a fresh slate.

When all else fails, just remember that we are new teachers and we will make mistakes but it is what we learn from these mistakes that will make us a master of the trade. Thanks to everyone that has helped this first year teacher.

Patrick Wellert is a first year Agriculture Instructor at Chino Valley High School, Chino Valley, AZ.

Changing Pedagogical Paradigms for a New Millennium

By Antoine J. Alston

Current curriculum development initiatives and educational delivery approaches in schools around the nation have not kept pace with the rate of technological change that the United States has experienced over the past decade (National FFA Organization, 1999b). The National Research Council (1988), in *Understanding Agriculture,* emphasized that for agricultural education to remain viable, educators should emulate the best current programs while generating new ways to deliver the material.

How have North Carolina agricultural educators adapted to this challenge? What challenges do the teachers face in implementing instructional technology? What advice do teachers have for preservice teachers in relation to instructional technology utilization? Two North Carolina agricultural education teachers, in Greensboro, North Carolina, Mr. Shawyn Newton, at Southeastern Guilford High School and Mr. Jeremy Johnson, at Southern Guilford High School, shared their experiences.

Both teachers indicated their programs have been greatly impacted by instructional technology. Mr. Newton indicated that instructional technology has allowed him to have greater access to teaching resources, and increased communication with other educators. Mr. Johnson indicated that he utilizes instructional technology as a tool to enhance learning. Through a series of computer modules, he is able to challenge students to make use of their problem solving skills, by working in groups to solve case studies. Students then organize their findings into PowerPoint presentations and reports. Some of the student's work is posted on the department's Web page. Mr. Johnson acknowledged that technology has enhanced his lectures through the use of PowerPoint, which allows for the incorporation of graphics, using a ceiling-mounted projector. Mr. Johnson uses the software package ProLandscape by Drafix, which allows students to take a picture of a real home, design a landscape, and then photo-generate the landscape upon the home.

Barriers exist that hamper incorporation of technology into the instructional setting. Mr. Newton stated the lack of funding for instructional technology in agricultural education is a major hindrance. Another major obstacle identified is the lack of computer preparation students receive in previous grades, especially those students with special academic classifications. Mr. Johnson identified the lack of Internet access. Even though his program is equipped with a twelve computer modular facility, donated by Norvartis Corporation, Internet access is still a major barrier. Both Mr. Newton and Mr. Johnson indicated that the majority of financial support that they receive is through private efforts, primarily conducted through their respective FFA chapters.

Both teachers offer the following advice for teachers: (1.) Utilize technology to capture the student' interest in the subject matter, (2.) Embrace technology as a new agricultural teacher, considering that it a major component of today's instructional environment. (3.) Technology promotes student problem solving, oral, and written skills. Make great use of this vehicle of instruction to develop these skills in students.

Instructional technology has profoundly impacted the agricultural education classroom. As this has taken place, faculty at the university level have also had to make curricular adjustments. At NC A&T State University students formerly took AGED 400: Audio Visual Aides in Vocational and Extension Education, with emphasis on media, such as transparency and bulletin board preparation. It has recently been changed to AGED-400: Instructional Technology in Agriscience Education, with strict emphasis on the utilization of computer technology.

Instructional technology in agricultural education, not only in North Carolina, but nationally has and will continue to impact agricultural education pedagogy. As the National FFA Organization (1999) indicated the field of agricultural education must be proactive in developing its preferred future, a future which will surely be filled with technologically enhanced pedagogy.

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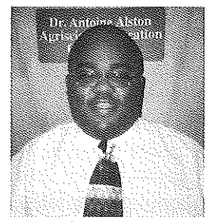

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Finding a Map for Non-Formal Agricultural Literacy Activities

By Stacie M. Turnbull

Have you heard the expression "if you don't know where you are going, any road will take you there?" We know the importance of having course objectives and lesson plans, but non-formal activities, such as displays and field trips, are often designed without a clear map – outlining goals and objectives. An activity is conducted, but without ever clearly pinpointing what the desired educational goal is, or how to get there.

In conducting the 'Mylo's Animal Barn', an agricultural literacy barn that is held at the Dodge County Fair in Nebraska, I have been guilty of failing to plan for the educational goals. At times, my motto was "if I have it, they will learn". The majority of the educational materials that were distributed ended up in trash cans without ever being read. The milk shakes for the milk mustaches melted, as the activity took place during a slow time at the fair. The by-products display was nice, but few people stopped to look at it. The list goes on. Where was my "road" map? I have now begun to pay more attention to the educational aspects of the experience.

Who is going?

Visitors to Mylo's Animal Barn, vary greatly in age, from infants to senior citizens. The experience and agricultural knowledge of the audience also varies greatly. John H. Falk (in Eberbach, 1997) suggests that a learning experience must focus on a specific target audience, while considering all within the audience range.

You need to provide an experience that will be satisfying to the lowest common denominator, typically children. You're missing the boat in a family experience, however, if you merely speak to the lowest common denominator. What ultimately makes it a satisfying intergenerational experience is if there are layers of information and experience that are as satisfying to adults as they are to children (Falk, as cited in Eberbach, 1997, p. 7).

Where are we going?

After you have decided who is going, the next step in planning any trip is determining where you are and where you want to go. The same is true here. A needs assessment should identify the gaps between the learners' current and desired proficiencies as perceived by the learner and others; that is, it should help define the "what is" and "what should be" (Galbraith, 1990). Determine what the audience currently knows, and what you want them to know.

For example, theme days for Mylo's Animal Barn are based on the agricultural commodities grown in Dodge County. The goal of the barn was to increase the agricultural literacy of people primarily living within Dodge County. Therefore, the desired proficiencies primarily focus on alfalfa, corn, soybeans, beef, and swine. Additionally, the objective is to expand the knowledge base, therefore activities related to international agriculture, non-conventional livestock, and entomology are included.

How will I get there?

The itinerary, or instructional package, should consist of educational goals, activities, needed materials and resources, and evaluation methods. The contact time and audience must be taken into consideration when designing the learning experience. The contact time in Mylo's Animal Barn, for example, varies greatly, from simply walking through the barn – in route to another destination – to spending several minutes or several hours in the barn.

Selecting and setting educational objectives should draw heavily from a needs assessment; however, other sources can contribute to the process. A learning objective is the intended or desired outcome and proficiency level that the learner should obtain as a result of participating in the educational experience. Learning objectives may focus on knowledge, skill, or attitude enhancement or a combination of the three to reach the desired outcomes (Galbraith, 1990). It is necessary to develop specific learning objectives to ensure that agricultural literacy remains the focus of non-formal agricultural literacy activities.

Falk (in Eberbach, 1997) states that learning occurs within a series of contexts – personal, physical, and social. The personal context is "the stuff you bring with you…that informs you how to think about the information you get from your environment" (p.7). This is an important context to consider as one's personal feelings on agricultural issues, positive or negative, will greatly influence ones ability or willingness to take in new information.

Falk also suggests that people attend exhibits to place themselves within a certain physical context. For example, one reason that people go to botanical gardens is that they wish to educate themselves about plants. In this same way, the assumption is often made that people attend a County Fair because (1) they are participating in fair activities (such as showing livestock), (2) they wish to learn more about the activities within the fair (such as livestock), or (3) they are looking for entertainment. For the audience member who is looking for entertainment, areas such as a petting zoo will be of most interest. The petting zoo and other related entertainment activities draw an audience. In a well-planned exhibit, there is an educational objective that will be achieved within this context.

Finally, Falk looks at the social context. He states that neuroscience "research shows that socially provided information is as important, if not more important, in forming our thoughts and ideas" (in Eberbach, 1997, p.9). FFA members and adult volunteers, particularly current or retired farmers and spouses and agribusiness persons, help address this social aspect. Activities should be structured to incorporate social interaction between the volunteers and the audience.

Non-formal agricultural literacy programs, such as Mylo's Animal Barn, provide students with the opportunity to take part in agricultural literacy lessons with planned educational objectives and goals. Often overlooked in setting educational objectives is the educational benefit of the 'petting area'. Having animals available for children to pet and look at is an important aspect of the total experience. Ansbacher (1998) restates Dewey's perspective as, "What people *do* (or see, touch, hear, taste, or smell) in an exhibition is a necessary precursor to whatever they feel and learn" (p.4). In petting zoos, children have the opportunity to get close and personal with the animals – seeing, touching, hearing and smelling the animals. This experience allows students to formulate impressions and questions in their own mind. An effective educational program will build on these impressions and questions in meeting overall agricultural literacy goals.

The point of watching television programs ranges from educational to purely entertaining. Petting zoos have the same continuum. If the petting zoo is used with an interactive group, there is reflective follow-up, and if it is used in conjunction with set educational objectives, the activity can become educational, as well as entertaining. Providing a venue for students to investigate on their own, and encouraging them to question why and how, allows them to generate meaning through their own observation.

"The quality of any experience has two aspects. There is an immediate aspect of agreeableness or disagreeableness, and there is its influence upon later experiences …It is (the educator's) business to arrange for the kind of experiences which, while they do not repel the student, but rather engage his activities are, nevertheless, more than immediately enjoyable since they promote having desirable future experiences" (Dewey, 1938, p. 25).

Other considerations

The caliber of the volunteers must be considered in the total environment in which the learning is to take place. An activity is only as good as those presenting it. Having an inadequate number of volunteers, volunteers not being prepared or presenting incorrect information, may have negative consequences.

In addition, the environment, according to Ansbacher (1998), includes the temperature and noise level of the room. For Mylo's Animal Barn, the heat is often a factor. Additionally, the amount of time spent at the fair plays a part. For example, if the visitors are hot and tired when reaching Mylo's Animal Barn, they are less likely to fully participate in the learning. While heat is a factor beyond control, providing a shady spot with chairs for individuals to sit and rest is an appropriate offering. If parents/grandparents have a spot to rest, they are more likely to bring children to the area. This approach then allows children to participate further in the activities.

Non-formal agricultural literacy activities are wonderful opportunities for FFA chapters and community members to share and learn together. With a little planning and a map to guide you, the learning experience will be sustained far beyond that one day at the fair!

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Successful Field Trips: A Three-Step Approach

By Brian Myers and Linda Jones

Field trips have long been a major part of the agricultural education curriculum. However, due to increased liability concerns, many administrators balk at requests for field trips. This may also be due in part to the movement toward academic accountability. The focus on scoring well on standardized tests may cause many administrators to question the value of field trips.

In spite of these concerns, well-planned field trips are a valuable tool in the agriculture teacher's educational toolbox. A field trip can be an integral part of the classroom / laboratory instruction component of an agricultural education program. Good field trips provide first-hand experience related to the topic or concept discussed in the classroom. They provide unique opportunities for learning, not available within the four walls of the classroom or laboratory. One example is a turf grass management class visiting a golf course. A trip such as this would allow students to see first-hand the many principles of plant growth and management, pest control, and watering techniques.

A field trip should be designed so students can easily make connections between the focus of the field trip and the concepts they are learning in class. Numerous research studies in science education have documented significant increases in student factual knowledge and conceptual understanding after participation in well-planned field trips. When planning and organizing a successful field trip, three important stages should be included: pre-trip, trip, and post-trip (see Figure 1).

The pre-trip stage of a field trip involves two major components: administration and instruction. The *administration* component involves all of the steps taken by the teacher to organize the logistics of the field trip. Steps include securing permission from the school administration, organizing transportation to and from the field trip location, contacting the field trip location to verify the schedule and activities, and obtaining signed permission slips from parents/guardians of the students attending the field trip. Most school districts have well-defined policies and procedures teachers should follow in order to complete the administration component of the pre-trip stage. Unfortunately, many teachers only focus on administrative concerns during the pre-trip stage of field trip planning. Although the activities of the administration component are important, if teachers only focus on logistics, a major segment of the pre-trip stage is missing and field trips may not be educationally successful.

The *instruction* component of the pre-trip stage is critical in preparing students for a field trip. Numerous research studies have shown that students often have high levels of anxiety when going on a field trip. Anxiety levels can be especially high for field trips to novel, unfamiliar settings. Often a field trip is the first experience a student has with a particular off-campus location. When students experience high levels of anxiety, learning cannot take place. To reduce anxiety, teachers need to make students feel comfortable and safe at the location of the field trip just as they would in the classroom. One method of accomplishing this goal is to provide students with vicarious exposure to the field trip site as part of pre-trip instruction. Vicarious exposure could involve the teacher showing students photographs, drawings, or a videotape of the site to be visited. Items such as the location of restrooms and basic features of the site should be discussed. If students will be at the field trip site for lunch, such arrangements should also be discussed. Studies in science education have shown time and again that providing students with vicarious exposure prior to a field trip significantly reduces student anxiety and increases overall trip effectiveness.

As part of instruction, teachers should review safety and behavior rules and expectations with students. These items should also be included in permission slip letters to student parents/guardians. Some agricultural education teachers have also found it helpful to develop a form for students to use to notify other teachers of their absence due to a field trip.

To increase the educational effectiveness of field trips, pre-trip instruction should also focus on the content topics and concepts that students will be investigating during the field trip. It is important for teachers to give students verbal clues regarding what to look for during their field trip activities. This pre-trip instruction helps students better focus on the educational goals of the field trip. As part of pre-trip lessons, teachers should demonstrate the use of any equipment and explain in detail any assigned activities that will be occurring during the field trip.

Research has clearly shown that during field trips learning activities involving groups of 2-3 students are most effective. These groups should be assigned during the pre-trip stage. Specific roles of each group member during assigned activities (such as observer, recorder, graphic artist) should also be explained in advance.

The second stage is the trip itself. Two components should be addressed during this stage: the role of the student and the role of the teacher. The *role of the student* is accomplished by establishing a field trip agenda and sharing this agenda with the students. A suggested agenda for a field trip starts with a brief amount of free time for students to explore the field trip site on their own. This open exploration may not be appropriate in all locations. For example, students could not roam freely inside an equipment manufacturing plant. They could however, have free time to view items in the visitor area or lobby prior to the guided tour. This exploration time allows students to get comfortable with their surroundings. Once the basic curiosity of the facility is satisfied, students are better able to focus their attention on the content topics to be learned. The second phase on the agenda is often a whole-class guided tour. During the tour, the teacher or tour leader can point out specific items that relate to the educational goals of the trip. This also provides an opportunity for students to ask any questions they may have developed during their exploration time. The third phase of a suggested field trip agenda is a small group learning activity. Working in pre-assigned groups of 2-3 students, students can complete an activity such as a short worksheet or scavenger hunt. The worksheet should be designed in a manner that is challenging to students yet not frustrating. The worksheet should clearly relate to the educational goals of the field trip.

The *role of the teacher* is also an important consideration during the trip stage. Although monitoring and management of student behavior is important, monitoring student learning is also a major teacher responsibility. Throughout the field trip, the teacher should be actively engaged in teaching activities. However, on field trips the teacher must utilize different teaching approaches than those used in traditional classrooms. Teachers should interact with students to help answer questions they might have. Teachers should also initiate discussion with small groups of students by asking them questions. During field trips, teachers should function more as facilitators or guides rather than directors. By playing an active rather than a passive role during the field trip, teachers can increase student interest and learning.

The third and final stage of a successful field trip is the post-trip stage. Like the stages before it, this stage also contains two components: debriefing and a culminating activity. During the *debriefing* session, students should be encouraged to share and discuss their experiences during the field trip. This could include sharing and discussing data or results of assigned small group activities as well as sharing feelings about specific aspects of the trip or overall impressions. Students should also be given an opportunity to identify and discuss problems encountered during the field trip. The second component is a *culminating activity*. This activity should give students an opportunity to apply the content knowledge they gained during the field trip. Culminating activities should help students tie together content they covered in regular class sessions and content learned during the field trip. They can be whole class or small group experiences. Both the debriefing and culminating activity should occur as soon after the trip as possible.

Planning and organizing a successful field trip can be a great deal of work for a teacher. However, by following the simple steps in each of the pre-trip, trip, and post-trip stages, your students can greatly benefit from your labor. Also when a well developed field trip plan is presented to administrators, many of their concerns are usually addressed. Field trips should be an integral part of agricultural education. If teachers properly plan and execute educational field trips everyone can benefit from the experience.

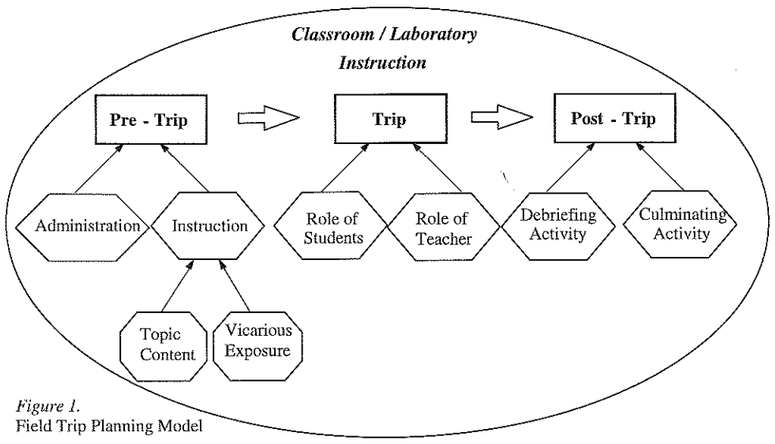

Figure 1.
Field Trip Planning Model

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"They Can't Do That To Us!"

By G. Victor Beekley

G. Victor Beekley taught agriculture at 1000-student Country High School, grades 9 to 12. His experiences, recounted in a series of vignettes, describe the challenges and opportunities teachers face as they teach and learn from students.

Agriculture teacher G. Victor Beekley and seven junior and senior students were attending the State FFA Convention in the state's largest city. On trips like this Beekley tried to include experiences in addition to convention activities that provide students opportunities to see and learn something about the city they are visiting. In this case, the convention city was not only the state's largest but was the home of a zoo regarded to be one of the most extensive and outstanding in that part of the U. S. One afternoon during a break in convention activities when Beekley proposed they visit the zoo, the enthusiastic response was, "Let's go."

When they arrived at the zoo entrance they were confronted by a sign that read, "No whites admitted to the zoo today." Since Beekley and all the students are white, the sign immediately drew reactions. The students were stunned, and Joe, one of the more vocal of the group, proclaimed, "They can't do that to us!" Another student proposed that they enter anyway, but cooler heads prevailed when Beekley called to their attention a security officer nearby.

Beekley realized that he and the students were experiencing an unusual incident for "whites." They were being denied admission to the zoo on this particular afternoon simply because they were white. They were experiencing discrimination, probably for the first time. Beekley, gathering the students around him, asked, "What do you think the sign says the other six days of the week?" Immediately the students realized and stated in various ways that each day the zoo was open, with the exception of this particular day of the week, the sign prohibited persons who are non-white, specifically African-American, from entering the zoo. So Beekley and the students selected another activity for the afternoon, then returned to visit the zoo another day.

Over the following months and years Beekley's reflection on this incident repeatedly bothered him. Five years after the Supreme Court of the United States declared racial segregation in public schools unconstitutional, why was he – a teacher in a segregated public high school– seemingly oblivious to the wrongness of racial segregation? Similarly, why was he unaware and apparently unconcerned that only males enrolled in agriculture courses or taught agriculture in the state where he was employed? Gradually he came to realize that he had identified two significant social issues of the day – racial segregation and discrimination against females as students or teachers of agriculture – about which he was not mindful, if not indifferent.

The lesson Beekley learned from reflection on this incident was to resolve throughout his subsequent career to be sensitive to this question: "What are the important social and ethical issues of the day that I should be aware of and concerned about, should learn more about, should think more about, and most important, take a position on and do something about as a responsible citizen and educator?"

When Beekley and his students find themselves experiencing discrimination for the first time, it proves to be a strong lesson. A multitude of agricultural education resources and FFA programs are available to assist students and educators in reflecting and acting on social issues. Students are shown in Japan, while traveling through the FFA Global Program. (Photo courtesy of Stacie Turnbull)