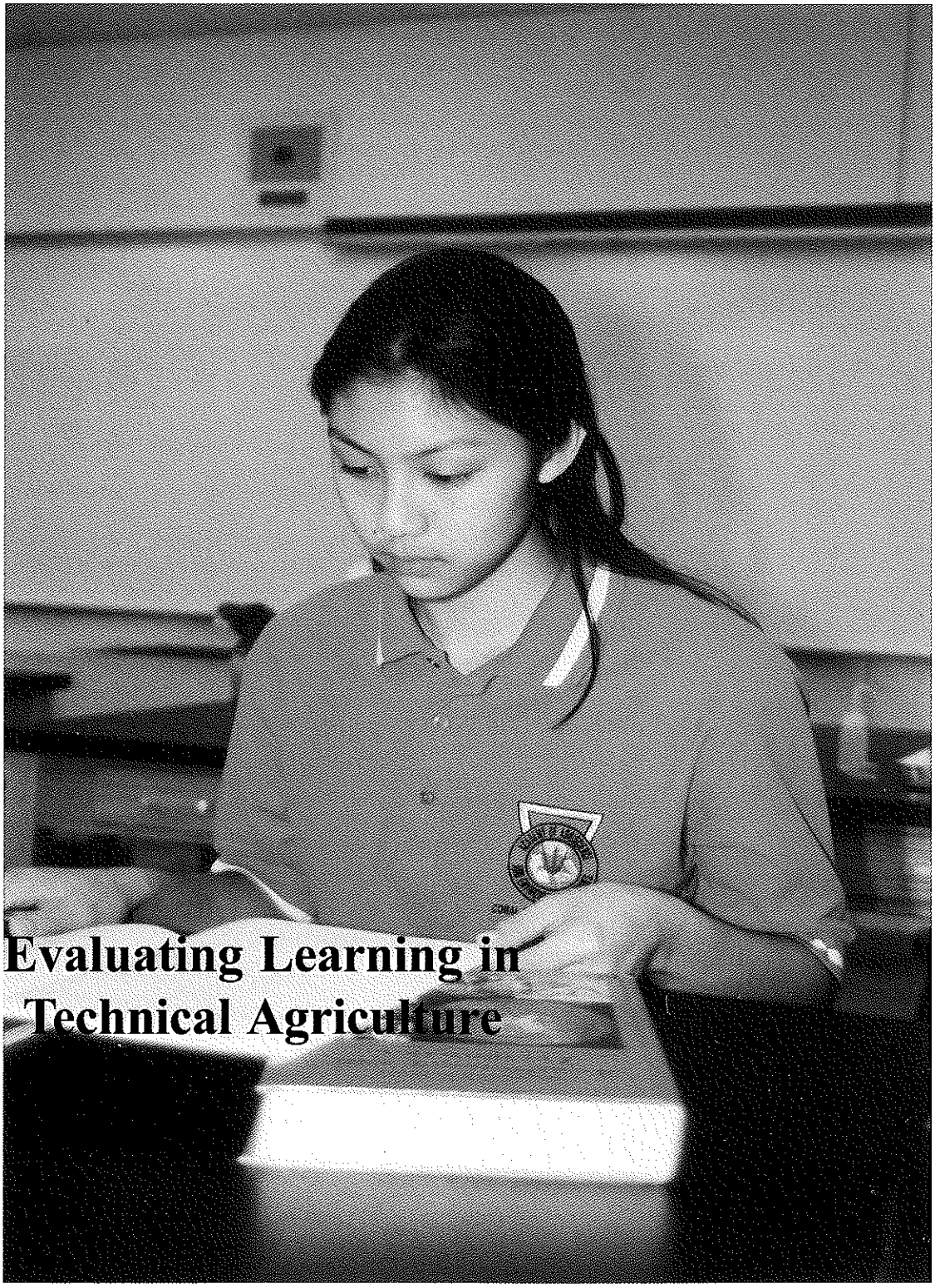
March - April 2001
volume 73
issue 5

The Agricultural EDUCATION MAGAZINE



Evaluating Learning in Technical Agriculture

From Inputs to Outputs: What's the Impact?

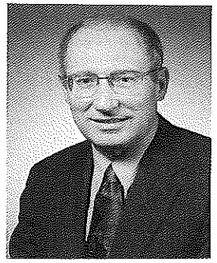
By Robert Martin, Editor

Recently, various educational institutions at all levels have become fascinated with learning outcomes or outcomes-based education. To satisfy the emphasis on results, much attention has been given to the evaluation, or more likely, testing of students at every opportunity. While these attempts to measure results may be appropriate and well-intentioned, it seems worrisome that not much attention is being given to the inputs. Assessing learning often focuses on testing and acquiring some level of output.

Perhaps what we need is a more holistic approach to assessment, which takes into account a broader spectrum of concerns. *What are our goals and objectives? What inputs will help meet these goals and objectives? What outputs are expected? What outcomes will be evident? How will we measure the impact or long-term effects? What differences will be realized from all this effort? Some questions to think about as you read this issue.*

Thanks to Kathleen Kelsey for leading the effort to collect a great variety of articles on a critical issue. Additionally, we appreciate the efforts of all the authors.

I remind readers that your comments and suggestions are welcome. Also, upcoming themes include *Experiential Learning, Service Learning, Role of FFA in Learning, and Lessons from the Classroom and Research on Learning.* If you have ideas for articles on the themes or on other topic areas, please let us know. Your ideas are welcome. Enjoy this issue of the magazine.

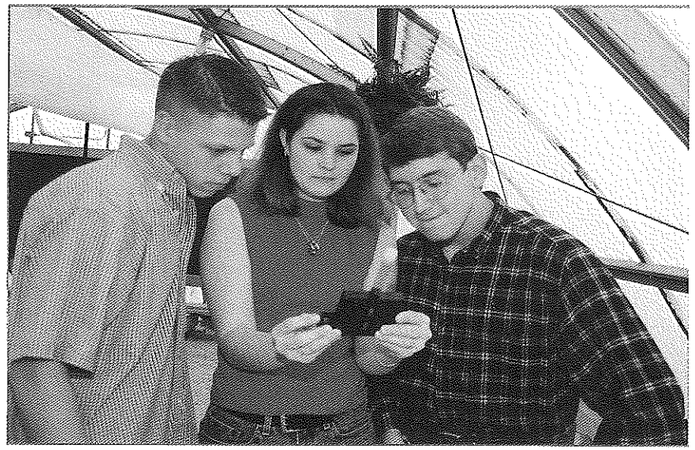


Robert A. Martin is Editor of The Agricultural Education Magazine. He serves as Professor and Head of Agricultural Education and Studies at Iowa State University.

Upcoming Theme Issues

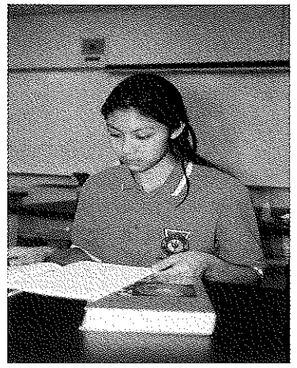
July-August:
Service Learning - What is it? Fad or Tool? Does it make a difference?

September-October:
FFA and Learning - How does FFA help Learning?



Educators are challenged to find effective methods to evaluate student learning in technical agriculture. Here a small student group develops knowledge by testing a water sample in the aquaculture laboratory at James Madison High School in San Antonio, Texas. Photo courtesy of Jasper S. Lee, Demorest, Georgia.

Theme: Evaluating Learning in Technical Agriculture



A student at Coral Reef High School in Miami, Florida, uses an Activity Manual to guide her in learning agriscience. Photo courtesy of Jasper S. Lee, Demorest, Georgia.

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Articles and photographs should be submitted to the editor or theme editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed double-spaced, and include information about the author(s). One hard copy and one electronic copy of articles should be submitted. A recent photograph should accompany the article unless one is on file with the editor. Articles in the magazine may be reproduced without permission.

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Publication Information
The Agricultural Education Magazine (ISSN 073224677) is the bi-monthly professional journal of agricultural education. The journal is published by the Agricultural Education Magazine, Inc. and is printed at M&D Printing, 616 Second Street, Henry, IL 61537.

Periodicals postage paid at Mechanicsville, VA 23116; additional entry at Henry, IL 61537.

POSTMASTERS: Send Form 3579 to Rosco Vaughn, Business Manager, 1410 King Street Suite 400, Alexandria, VA 22314, Phone (800)-772-0939.

Overcoming Standardized Testing with Authentic Assessment Strategies in the Classroom

By Kathleen D. Kelsey

As teachers, we ask ourselves "did our students learn anything today". As evaluators, we also ask, "did they learn what we intended for them to learn today", knowing that schooling and learning are often two independently occurring events. Teachers are increasingly being held accountable for students' learning under the guise of the standards movement where high stakes testing often determines the fate of a child's educational experience.

President Bush chose to focus on public education as his first order of business for his presidency, further focusing the light on what we do as teachers. Unfortunately, the President's plan calls for more standardized and high stakes testing (Bush, 2001). The January 2001 issue of Phi Delta KAPPAN (vol. 82, No. 5) featured four excellent articles on standardized testing, highlighting the fallacy of this movement and the negative impacts on children.

This timely issue of the Agricultural Education Magazine highlights several articles that discuss assessment within the agricultural education classroom. I encourage you to ponder two issues. First, what impact will the Bush Administration's focus on standardized testing have on agricultural education programs, and second, what does it mean to authentically assess your students' achievement in your classroom?

In his article titled "Texas Assessment of Academic Skills", Doug Ullrich outlined then Governor George W. Bush's efforts toward moving Texas to a test-based school system.

The Career Development Events sponsored by the National FFA Organization are designed to authentically assess students regarding lessons learned in the agricultural classroom. Richard Beard, superintendent of the National FFA Agricultural Mechanics CDE, explains the expectations and purpose of that particular CDE in his article. He stresses that the event is designed to recognize students with agricultural mechanics competencies that are important in the workplace, not to win the competition.

In their article, "Authentic Assessment: Good or Bad?", Mel Weber and Bob Stewart define and compare traditional testing with authentic testing, pointing out the benefits and cautions associated with each approach. In her article, "Evaluation of Student Learning in the 21st Century", Carol Conroy elaborates on several "points of agreement" regarding students assessment, noting that diversity is the key to success when evaluating students in the agricultural classroom.

Barry Boyd discusses the importance of developing a classroom that is both learner-centered and teacher-directed in "Formative Classroom Assessment: Learner Focused". He highlights strategies for seeking feedback on student learning. In his article titled "Don't Fear the E-Word! Techniques for Evaluation", Edward Franklin details techniques for easing student anxiety surrounding testing.

Jasper Lee offers an alternative testing procedure to agricultural educators in "Using Achievement Testing in Agri-science" that closely parallels what students are learning in integrated agri-science courses that is weighted toward animal and plant science content.

On a different note, Bill Weeks offers us a treatise on "What's Gonna Happen to the Class of 2010?" as he follows his nine-year old son through a variety of activities that demonstrate excellent starting points for a Supervised Agricultural Experiences.

Authentic assessment is intricately linked to authentic teaching, which consists of modeling, coaching, and organizing the thinking of the students, and creating the conditions for education to happen (Campbell, 2000). Can standardized testing capture the complexities of genuine educational experiences? I fear not, and fear still that teaching to the test will continue to dominate many instructional hours as we school, rather than educate our youth.

References

Bush, G. W. (2001). No child left behind. Available: http://www.ed.gov/inits/nclb/index.html

Campbell, D. (2000). Authentic assessment and authentic standards. Phi Delta Kappan, January, p. 405-407.

Phi Delta Kappan (2001). Available: http://www.pdkintl.org/kappan/ktoc.htm

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Growing New Technologies

By Ron Whitson and Robert Breddin

Our world is rapidly changing. In order to prepare our students for the challenges of the twenty-first century workforce, it is necessary for our instructional strategies to change to reflect those advances in technology.

Even as communities nationwide evolve from rural to urban, nearly twenty percent of our nation's workforce remains connected to the industry of agriculture/agribusiness. It is, of course, a well-documented fact that each year the total number of acres devoted to production agriculture continues to decline. This fact highlights the need for incorporating new concepts and technologies into our Agricultural Education programs.

The Agricultural Science and Technology program at Mansfield High School serves some 350-plus students each year. Agriculture/agribusiness courses at the suburban Texas school range from the traditional to the exotic. The use of technology is incorporated into each of the 21 courses offered.

A long-range instructional goal of the local school district is to provide appropriate technology, adequately supported by technical infrastructure and to integrate this into each classroom. With this goal in mind, the five Agricultural Science and Technology teachers at Mansfield recently wrote, submitted and were subsequently awarded a grant by a local education foundation entitled "Growing New Technologies".

Incorporating technology into the classroom is nothing new at Mansfield, though finding the available resources to keep pace with technology continuities to be a great challenge, however. The program was among the first to introduce computer technology for student use during the early-to-mid 1980's. The school's Computer Maintenance and Repair and StRUT (Students Recycling Used Technology) programs have allowed the Agricultural Science program to build and maintain the equipment necessary to allow each Agri-Science student the opportunity to have hands on experience on computers as a part of each Agricultural Science and Technology course. The program's basic premise that keeping pace with advancing technology helps train better prepared students, has been well supported by the school's administration and the community.

All six classrooms used for Agri-science have multiple fully networked computers for use by both students and teachers. Full computer labs are in use for the "Computers in Agriculture" course as well as at the school's Agricultural Science Center. Incorporating presentation software (Power Point) and other technology into daily lessons has become common. Tools such as the Flexcam provide for exciting ways for students to learn.

The Growing New Technologies grant is providing for the introduction of new ways of learning across the entire Agri-Science curriculum. A complete weather station allows students to study simple meteorology and how the weather can affect agriculture. GPS (Global Positioning System) technology is being introduced to students to demonstrate its use in agriculture as well as in outdoor recreation settings. Three important elements that have proven themselves effective in the Mansfield program are:

1. *Technology should be transparent.* It should be a normal and regular part of the learning events to the extent that everyone not only accepts it, but also expects it.

2. *Technology teaching should be project-based teaching.* Allowing students to use real-life examples provides a greater understanding as well as additional motivation for students. A student's SAE project or the family's home situation can often provide the material needed to bring realism to technology instruction.

3. *Collaboration by students will also enhance the learning experience.* Working together on projects will build teamwork and interpersonal skills demanded by today's challenging job market.

It is important that Agricultural Education students be provided with the opportunities to experience and use technology as part of their learning experience. Exploring and utilizing the new and specialized technologies in agriculture and agribusiness can only better students for the challenges of the 21st Century.

Ron Whitson is an agricultural science and technology teacher at Mansfield ISD in Mansfield, Texas.

Robert Breddin is an agricultural science and technology teacher at Mansfield ISD in Mansfield, Texas.

Using Achievement Testing in Agri-Science

By Jasper S. Lee

Could achievement tests be used to assess student knowledge in technical agriculture subjects? Emphasis on accountability in education has raised the issue of using standardized achievement tests in agricultural education.

Achievement testing has been used to assess students' knowledge in academic subjects. Many schools administer such tests near the end of the school year. The goal is to determine if students have gained sufficient knowledge of subjects such as science and social studies. Since agricultural education now emphasizes the integration of academic areas, the use of standardized achievement tests may be appropriate. These tests are widely used in education and tend to remove teacher and self-assessment bias.

The first test developed is known as the Agri-science Achievement Test (AAT).

Situation

Agricultural educators have expressed that written tests may not effectively assess what students have learned in their classes. This is likely true with some kinds of skills, such as those in agricultural mechanics. On the other hand, students in agricultural education are expected to acquire background knowledge. There is no reason why one approach to assessing this knowledge cannot be the use of standardized tests.

The ability to locally design the curriculum has been a positive factor in agricultural education. Recent statewide standards and moves toward integrated science-based classes have reduced the "localization" of the curriculum. This further supports the use and merit of a broad-based testing approach.

Policy makers are demanding more accountability. They want to increase the use of tests to determine if students are achieving. Having tests specifically for technical agriculture is definitely beneficial in agricultural education.

Test Development

Test development procedures were used to yield an efficient, valid, reliable, and universally acceptable achievement testing approach. Academic achievement testing was included in the process. The first test developed was the AAT. The AAT is designed to assess student knowledge in beginning and advanced science-based agriculture classes. The process of developing the AAT can be summarized in seven procedures.

Procedure One: Test Study - The first procedure was to determine the format of the test and how it could be structured to be readily administered in a wide range of school situations. A multiple-choice format was selected. Two levels of student achievement were identified as introductory or basic and advanced. These levels became the two forms of the AAT. The Basic Form was designed to be administered at the end of the first science-based class. The Advanced Form was for administering following at least two classes in science-based agriculture.

Procedure Two: Technical Content - This procedure involved identifying the technical content to be covered by the AAT and writing the items that assessed student knowledge of the content. State curriculum guides and benchmarks, lesson plans, and commercially-produced materials for science-based courses in agriculture were used to guide the test content selection. A pool of 200 draft test items was prepared.

Procedure Three: Validation - Once in draft form, the test items were reviewed by a national team of validators. The validators represented diverse school situations and geographical areas of the United States. Their role was to rate the appropriateness of each item and indicate if the item should be on the Basic or Advanced Forms. Validators also edited test items and provided other suggestions.

Procedure Four: Structure Test Forms - Sixty items each were configured into the Basic and Advanced Forms of the test. The items selected were intended to reflect the science-based content in classes in areas of plant, animal, and physical sciences.

Procedure Five: Field Use - Both forms of the AAT were field-tested nationwide in schools representative of those offering science-based agriculture classes. Nominations of schools were received from state supervisors and others. Each nominee was contacted to determine their willingness to participate and follow specified and exact procedures. A signed agreement was executed between teachers, test specialists, or others to administer the tests. Exact information on classes and enrollments was obtained to assure proper test packet preparation.

Procedure Six: Administration - Copies of the AAT were prepared in packets for shipping to the schools. Exact numbers of the Basic and Advanced Forms were sent based on class enrollments reported by test administrators. Detailed instructions were provided to assured that all schools used comparable test administration procedures. Envelopes with specially prepared seals were used for returning the tests.

Procedure Seven: Scoring and Analysis - Upon return, all tests were scored. Reports were prepared for the participating schools that provided individual student scores as well as school and nationwide information. Minor modifications were made in the testing procedures based on the field test results.

The Tests

The final product of these procedures was the Agri-science Achievement Test, which includes Basic and Advanced Forms. Several schools have used the testing program to assess achievement of their students. Efforts were made to alleviate test anxiety by both students and teachers. All tests are centrally scored. Test information is individually prepared for schools.

The final test forms stress the assessment of student achievement in areas of integrated science. More question items in both forms of the AAT deal with animal science subjects than with plant science or physical science.

Table 1 shows the number of items in the areas of science. The raw scores of students on 60 items on the Basic Form averaged 37.82, or 63 percent correct. On the Advanced Form the average raw score was 34.23 out of 60 items, or 57 percent correct.

To the reader, these scores may appear low; some would argue that they are below passing in most schools. This does not deter usefulness in comparing scores of individual students and schools with the national scores.

Scores have been determined for each of the three areas of science. Students had a higher percentage correct in the plant science area than in animal science or physical science. The test results are summarized in Table 2.

Implications

Results were analyzed in terms of selected teacher and school attributes, as this relationship offers ways to enhance student achievement.

The implications point to the use of instructional approaches that yield higher student achievement test scores. Teaching practices can be selected that promote higher scores. Overall, students achieve higher scores in classes taught by teachers focusing on content mastery and use deliberate instructional procedures.

Summary

Achievement tests are effective means of assessing student knowledge of technical agriculture. One test is not sufficient when curriculum diversity is considered. Tests are needed for each major subject area in the curriculum. Test items must be developed that assess knowledge of integrated science areas as well as those applied in agriculture. Test administration procedures must be uniform and easy to follow. Integrity of the testing process must be assured; otherwise, the results of testing will be of little value.

Table 1. Areas Covered and Number of Test Items in Each Area

Science Area	Basic Form	Advanced Form
Animal Science	24	21
Plant Science	17	16
Physical Science	15	17

Note: Four items on the Basic Form were not science-based. Six items on the Advanced Form were not science-based. These items related to career and personal information and skills.

Table 2. Student Scores in Science Areas on Both AAT Forms*

Science Area	Basic Form	Advanced Form
Animal Science	13.96 (58%)	11.98 (57%)
Plant Science	12.21 (72%)	10.03 (63%)
Physical Science	7.51 (50%)	9.97 (59%)

*Number correct and percent correct in each science area are reported for the Basic and Advanced Forms of the AAT.

Jasper S. Lee is a consulting agricultural educator in private practice as LEE AND ASSOCIATES, P. O. Box 280, Demorest, GA 30535. More nformation about the AAT and other tests is available from the author.

Don't Fear the E-Word: Techniques for Evaluation

By Edward A. Franklin

Moving to a new community recently, one of the decisions my wife and I was faced with was to decide where we wanted to set up housekeeping. Having elementary school-age children, it was evident that schools played a factor in our decision. We received information on the many school districts in and around the metropolitan area. Listed in promotional materials were individual schools and school districts, along with average standardized test scores achieved by their students. The realtors we visited with expressed their opinions about what school districts were the "best" based on the reported test scores.

It occurred to me as an educator what impact the process of student evaluation has beyond the classroom; specifically on the surrounding community: property values, prestige, and neighborhood development; as if there was not enough pressure on students and teachers already!

Pressure placed upon student performance on one of the many standardized proficiency exams (ACT, SAT, AIM, etc.) is immense. Not only is the student's educational future determined largely on their performance, but the reputation of the school and community. Students are prone to anxiety (Davis, 1993; McCormick, 1994) when it comes to evaluation.

How about tests and evaluation in general? Does evaluation serve a useful purpose in the classroom? When it is used as leverage to correct student behavior or as punishment, then the process is viewed with dismay and something to be avoided. If it is such a stressful activity, then of what value is it?

Role of Evaluation

The purpose of a test should be to assess a student's performance against learning criteria, not to provide the instructor with the basis for a grade (Wong, 1998). Tests should be geared toward your learning objectives. According to Davis (1993), testing serves four functions: first, tests assist the instructor to determine whether students actually learned what we expected them to learn; second tests can be used to motivate and help students direct their academic efforts. If a student expects a test to focus on facts, then they may memorize details; should a test require problem solving, then students will work towards understanding and application.

Third, tests can help the instructor determine how successful he/she was in delivering the material; if students do poorly on an exam, do I fault them for not really trying, or is it possible I did a poor job of conveying the information? Did the test actually measure what I intended to measure? Finally, tests can be indicators to students of what topics or competencies they have yet to master and need to concentrate on (Davis, 1993).

Process of Evaluation

Evaluation can be visually illustrated as a cyclic process (see figure one). Educational objectives are recognized as a change in student behavior; what the student knows (cognitive), feels (affective), or can do (psychomotor) post instruction, compared to pre- instruction. According to McCormick (1994), these changes are the "product". The process by which the change occurs is known as the ways and means.

Methods of Evaluation

Incorporate the evaluation process into several different activities. It does not always have to be a pencil and paper test. Provide a variety of activities and methods to evaluate student growth, strengths, weaknesses, and development.

Evaluation should serve to motivate students, not discourage them. Allow students to conduct a self-assessment of their skills along with your assessment so they can compare. This can be easily done with projects constructed or assembled in the shop, lab, or greenhouse. Chances are, the student will be more critical of their own work than you will. They will begin to understand your criteria for accomplishing the task.

Different class sections of the same course may not learn at the same pace. Be prepared to offer different evaluation assignments. For students with special needs, consult with the resource personnel on your campus. Provide them copies of the evaluation activity as well as your class notes or textbooks and allow special needs students to complete the activity outside of your classroom. According to McCormick (1994), the evaluation process should consider both the beginning status and growth

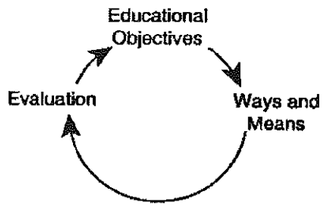


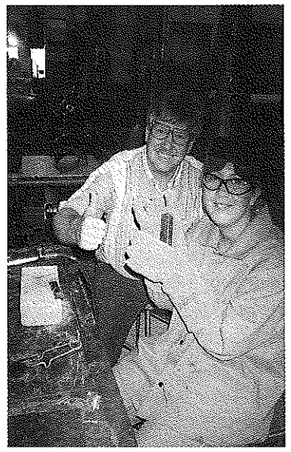
Figure 1. The cyclic process of evaluation from *The Power of Positive Teaching* (McCormick, 1994).

of the student. Rather than measure the rate and pace of growth of the students, we should be considering the amount of growth that occurs in each student.

Students suffer from anxiety because their peers, as well as their parents, judge them by their performance. Mail a sample of one of your tests home to the parents. Give them an opportunity to see what level the questions are prepared and the variety of your questioning methods.

Reduce the subjectivity of grading tests and projects. Do not have students write their names on their work, rather assign random numbers (or utilize school ID numbers) to identify students for the purpose of evaluation when students submit work to be graded.

It is easy for an instructor to unconsciously place a certain level of expectation upon individual students when evaluating their work especially when they are familiar with their previous submissions. A teacher may think: *"I know he/she is capable of doing better work"*, or *" well, what can I expect from him/her, this is typical of what he/she has produced all semester long"*.



Franklin is seen here working with a student.

There is no question that our profession is time consuming. The "extra stuff" can consume more time than the actual teaching of the lesson. After a week of making SAE visits, coaching CDE teams, preparing student speakers, attending booster or advisory committee meetings, faculty meetings, completing paperwork for the state department, and attending professional develop meetings, grading assignments, and picking up material for shop projects, when do we have time to sit down and prepare examinations that include a variety of questions, from all levels of Bloom's Taxonomy as we were taught during our pre-service days at the university? How many times have you heard your principal say during a faculty meeting "If we don't start using that Scantron machine, we will lose it"? Gee, what type of evaluation method should I use?

Check with your administrator before you allow students to "trade papers and grade each other". For the sake of time it is an easy practice; however, you may well be violating the privacy of your students and could face severe consequences, especially if students tease each other about their scores. This should carry over to the practice of using student assistants to grade student papers.

Tracking Student Progress

For those with access to computer technology, an electronic grade book can save time in entering and computing student scores and grades. Using an Excel spreadsheet is an easy way of constructing a useable grade book. Microsoft produces a very useable version that ties in nicely to your Excel spreadsheet software is and is free to download. The key to keeping ahead of the game is to plan to spend time inputting scores on a regular basis.

Also, don't forget to backup your computer software. A printout kept in a secure location will provide you with the data you need should you encounter a glitch, an accidental deletion, or erasure. Your goal should be to have all students' scores inputted and an up-to-date progress grade listed. That way you will be prepared when one of the counselors, a parent, or an athletic coach sends one of your students around asking for a weekly progress report. Don't get caught by surprise!

In The Power of Positive Teaching, McCormick (1994) does a very good job of presenting the advantages and disadvantages of essay or problem solving questions, recall questions, recognition questions, and offers suggestions for writing test questions in the cognitive, affective and psychomotor domains.

On a final note, anybody who said they switched their major in college to Agriculture Education because they thought it was "easier" missed too many Friday morning lectures.

References

Davis, B. G., (1993). Tools for teaching. Jossey-Bass Publishers: San Francisco.

McCormick, Jr., F. G. (1994). The power of positive teaching. Krieger Publishing Company: Malabar FL.

Newcomb, L. H., McCracken, J. D., & Warmbrod, J. R. (1993). Methods of teaching agriculture. Interstate Publishers: Danville, Il.

Wong, H. K., & Wong, R. T. (1998). The first days of school. Harry K. Wong Publications: Mountain View, CA.

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Texas Assessment of Academic Skills

By Doug Ullrich

No issue is more controversial in U.S. education than mandatory statewide or nation-wide testing (Fordham Report, 1998). Many people believe it is an essential ingredient of reform while others feel it is a menace and a distraction to quality teaching and learning.

To better understand the issues that the Bush Administration will support, one must first be familiar with the history George W. Bush brings to the presidency. The accountability system in Texas is one of the nation's toughest, according to Education Weekly (Brooks, 1999). The system began under Governor Ann Richards. Although President Bush did not create the system his administration has expanded and increased the expectations of students as well as school districts and teachers.

For the past decade, as required by state statute, Texas has assessed minimum basic skills in reading, mathematics, and writing, first with the Texas Assessment of Basic Skills (TABS) tests and then with the Texas Educational Assessment of Minimum Skills (TEAMS) examinations. Changes in state law required the implementation of a new criterion-referenced program. This changed occurred at the end of 1990 and the concept of the Texas Assessment of Academic Skills, or TAAS tests was born. (TEA, 2001)

Each year the 7,053 public schools and 1,042 school districts are ranked based largely on scores from the TAAS (TEA, 2001). The primary purpose of the state student assessment program is to provide an accurate measure of student achievement in the areas of reading, writing, mathematics, social studies, and science. The scores on these tests are the backbone of the Texas Education Agency's accountability system. This system rates schools as exemplary, recognized, acceptable, or low performing. Bonuses, pay raises, cash incentives, and public pressure are used to motivate administrators and teachers to teach the skills necessary for success on the tests.

Several shifts in philosophy have occurred since the dawn of the Texas testing program and several new assessments have been developed as a result of legislative requirements or actions by the State Board of Education (SBOE). Additionally the state has stipulated that end-of-course tests be administered in selected high school courses. Currently students must take an exit level test and those not meeting the minimum expectations must retake those sections of the assessment instrument on which they had not performed satisfactorily. Students cannot receive a diploma until they have passed this exit level assessment.

Even with a decade of statewide testing, all is not well. "Schools in Texas hold distinction for one of the lowest graduation rates in the nation coupled with one of the lowest ratings in the nation for college preparation," according to a report written by education research analyst Chris Patterson. Furthermore. As TAAS scores continue to rise, the percentage of Texas students who require remediation in college has grown 16 percent. Additionally, the SAT scores of students in Texas remain below the national average.

The Texas Public Policy Foundation (TPPF) claims that the focus on TAAS is getting as many students as possible to achieve at a very basic level. TPPF concludes that since so much hinges on these scores — promotions, hiring and firing decisions, financial incentives – school administrators are foolish if they don't reallocate time and substantial resources from higher-achieving children whom they know will pass the test to lower-achieving children who might not. Many schools have developed specialized classes during which lower-achieving students learn skills to help them master the TAAS. These classes are mandatory and in many cases the student must give up an elective class in order to stay on track and pass the TAAS.

With the ramifications of doing poorly on these tests, school districts use a wide variety of motivational techniques to encourage students to do their best during test day. Free food, video rentals, class parties, gift certificates to individual students and classes are commonplace. Schools have pep rallies and award ceremonies to further reward students who have passed all sections of the test.

A school that fails to rate "acceptable" faces grim consequences, including possible take-over by the state. As a result, many schools are liberal with exemptions for large portions of students. The Texas Justice Foundation contends that school districts exempt between 10 and 30 percent of their students, most of whom are minorities. The most common reasons given for student exemptions are language barriers and special education needs. Additionally, a huge increase in the number of students taking the GED has also contributed to skewing the data. If a student passes the GED they no longer have to take the TAAS.

According to Bob Chase, president of the National Education Association (NEA), the Bush Administration's education plan relies heavily on test scores. President Bush's plan would require two sets of annual tests (Mollison, 2001). Each state would administer tests in reading and math to all students in third through eighth grade, and the federal government would give different tests in those subjects to a cross-section of each state's fourth- and eighth-graders.

Scores would be made public for each state, district, and school, sorted by race and ethnicity, gender, English language proficiency, disability status and socioeconomic status. The NEA states that evaluations of public schools should be based partly on test scores, but also on attendance, dropout, and graduation rates, the number of students taking college-prep or college-level courses, and performance on SAT and ACT college admission tests. Yet, even with this type of system the focus remains on teaching to the test.

The critics of a national testing system have identified several concerns (Fair Test, 2001). Alleged harms include inflated test scores, curriculum narrowing , emphasis on lower-order thinking, and declining achievement.

Testing experts also add a quartet of other arguments including: 1) standardized tests hurt minorities and women (Robison and Walt, 1997), 2) the tests are too costly, 3) other countries don't test nearly as much as the U.S. does, and 4) many parents, teachers and students in this country are opposed to testing (Jesness, 2001). Furthermore, it is felt that the great emphasis placed on these types of tests and the consequences of doing poorly is the marginalization of gifted students and the incentive to cheat. Improper conduct of teachers and administrators has been found in many instances (Kilpatrick, 2001).

Through all of these concerns, Texas has retained and expanded TAAS. Moreover, the results do appear to be positive. Texas students' average state test scores have shown achievement gains year after year. Texas students have also made gains well above the national average on National Assessment of Educational Progress (NAEP) during the past ten years (Biddle, 1998).

Supporters of the testing system identify other benefits. The Fordham Report (1999) observed the identified the following concerning the TAAS test:

- A greater focus on academic learning;
- A culture of high expectations and enthusiasm toward reaching standards;
- Generous and immediate remediation efforts offered to poorly performing students, both because a system is in place to identify their problems early and because, with high-stakes tests, students' problems are not just passed along to the next grade, where they become compounded;
- Greater interest among teachers in academic strategies and more cooperation with each other to learn which ones work best, and how;
- With a regular system of assessment, quicker feedback for school faculty on which instructional systems work best; and
- To survive the culture of testing and accountability, Agricultural Education must prove to the "academic core" community that the curriculum taught supports the standards evaluated in the tests. If this cannot be accomplished eventually, local and state educational system will phase out or reduce the focus on career and technology programs, including agriculture.

References

Barksdale-Ladd, M.A. and Thomas K.F. (2001). What's at stake in high-stakes testing: Teachers and parents speak out. Journal of Teacher Education, 51(5), 384-397.

Biddle, B.J. (1998). Foolishness, dangerous nonsense, and real correlates of state differences in achievement, Phi Delta Kappan. Bloomington, IN: Phi Delta Kappa Online Article, August 8, 1998.

Brooks, A. P. (1999). Bush must share glory of rising TAAS scores. Available [online] http://www.austin360.com/news/features/national/0801bush.htm

Cizek, G.J. (1998). Filling in the blanks: Putting standardized tests to the test. The Thomas B. Fordham Foundation. October, 1998.

FairTest Examiner (1999). The Case Against TAAS. Available [online] http://fairtest.org/examarts/fall99/The_Case_Against_TAAS.htm

Jesness, J. (2001). The Tail That Wags the Standards Dog. Available [online] http://www.parentscoalition.org/resources/issues/taas/thetailthatwags.htm

Kilpatrick, J. (2001). It's Time for the Texas Education Agency to be Investigated. www.educationnews.org — Editorial, Available [online] www.parentscoalition.org/resources/issues/taas/investigatetea.htm

National Commission on Excellence in Education. (1983). A nation at risk: The imperative for educational reform. Washington, DC: Government Printing Office.

McGill-Franzen, A. (2001). Policy and instruction: What is the relationship? Handbook of reading research (Vol. 3).

McLaughlin, M.W. (1994). Educational policy, impact on practice. In M. Aiken (Ed.), American Research Association encyclopedia of educational research (pp. 375-382). New York: Macmillan.

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What's Gonna Happen to the Class of 2010?

By William Weeks

First, I live in a college town. The land-grant university, some light industry, and an active group of downtown merchants make up our community. We also have a Super Wal-Mart, open 24 hours and that says it all. Second, I'm the father of a nine-year-old son, Nate. I enjoy being a dad, and it has come with some unexpected rewards. I don't have to feel guilty about buying Cap'n Crunch, I have been known to play Nintendo until the wee hours of the morning, and I also know the names of at least a dozen Pokemon characters. Nate includes me in activities of his Cub Scout pack, takes me on bike rides, and allows me to be seen at school occasionally.

From time to time, undergraduates ask me if Nate will enroll in Agricultural Education or join the FFA. While I haven't lost any sleep over this question, I hope he will be interested in at least trying the program. Certainly, his second grade teacher has cultivated his interest in agriculture. Thanks to her, what my son lacks in exposure to production agriculture is being made up for in lessons on tissue culture, wildlife study, and seed germination experiments. When Nate is 14 he will be putting together a high school schedule. If you want him to enroll in your program, don't offer him tissue culture, because he has already done that. While I can convince him to try at least one freshman level agriculture course, I'm not so sure about his classmates. You will have to offer them something special too, or they will cast their lot with one of the other enticing electives.

Over the last few years I have come to appreciate other dads. There is an unwritten "dad-club", a club you automatically belong to because your son is a Cub Scout or t-ball player. In this club, dads usually stand around and either brag on their sons or explain that their son's bad behavior is from his mother's influence. You also get to find out a lot about the others dads in the club. These dads want things for their sons. Mostly the things they want are positive experiences. Can your agricultural education program offer my son positive experiences?

Here's what I saw last week:

§ Monday night we had a Cub Scout den meeting at Tyler's house. Tyler's dad arranged a woodworking activity for the boys where they all learned to use a handsaw, band saw, hand drill and the proper technique in using sandpaper. I said this activity was at Tyler's house, but I should have explained that it was in Tyler's dad's woodworking shop; a virtual showroom of up-to-date woodworking equipment. Tyler's dad works at a company that makes stereo speakers, but his love is woodworking. I left wondering if Tyler's dad would encourage him to enroll in Ag.

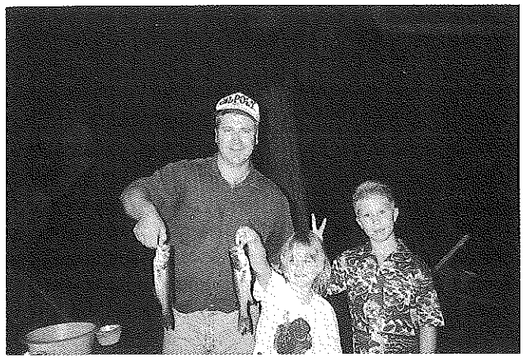
§ On Tuesday night we had coach-pitch baseball. Taylor's dad is the coach and he is an accountant whose first passion is baseball. He knows more about fertilizers and herbicides and turf grass and the clay on the pitcher's mound than I do. Chase's dad is our pitcher and he really is a coach, he coaches football. What he really loves is working in his garden. Tomatoes and peppers prepared into a secret salsa recipe are what he lives for. Taylor and Chase are both good ball players but I wonder if there is place for them in Agricultural Education.

§ Wednesday: I have some free time, so I stop by Sangre Elementary School for an hour. My son's classmate, Kurt, has his dad stop by today as a guest speaker. Kurt's dad is an aquaculture specialist and is speaking on identifying different species of fish. Second graders pull on too-big hip waders and help seine the outdoor classroom's pond. The former agriculture teacher swells inside me and I see an outdoor recreation proficiency award winner, but I'm not sure Kurt will be in Ag either.

§ When I get home from work on Thursday, Nate's friend Kyle is over. His family lives on a small acreage with lots of chickens and a huge garden. Kyle's mother spends every Wednesday and Saturday morning at the farmer's market selling their organically grown vegetables and cut flowers. Thanks to his parents, Kyle knows the difference between a carrot and a weed, and has a pretty good start on an SAE.

§ Friday: I picked Nate up from school and visited with John's dad, a retired big-city homicide detective, who now investigates the broken fence his cows have gotten through. John's mom and dad, who are agricultural economic professors, could help the class of 2010 put together a great FFA Marketing Plan CDE. Oh, there is Parker, whose dad is a former Vo-Ag teacher turned meat science professor. Can you say National Qualifying Meats CDE?

The more I think about my son's friends, the more encouraged I am about the future of Agricultural Education. I see young boys and girls who could really benefit from a challenging curriculum, a student organization that inspires leadership development, and an experiential learning opportunity that can make it come together. Then again, the more I think about his friends the more discouraged I become because I know their parents are going to ask a lot of their local Agricultural Education program. The Agricultural Education potential of this class of second-graders is enormous. I only hope that the programs can deliver for the Class of 2010.



Weeks, shown here with two of his children, wonders what role agricultural education will play in his son's 'Class of 2010',

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Authentic Assessment: Good or Bad?

By *Mel Weber and Bob R. Stewart*

Debates concerning what is right and what is wrong with American education are not new. What is new in the current discussion is the emphasis on high standards for ALL students. 'Standards-based reform' as it is called, demands a collaborative effort between parents, educators, policy-makers and the local community. It is a complex issue that has implications for all areas of education, including agricultural education. In this case, 'standard' means a standard to be both expected and attained - not standardized curriculum, in the sense that all students learn the same things and develop the same skills.

Central to the issue is the development of teaching techniques and assessment sthat are reality-based and flexible enough to take into account the diverse backgrounds and life experiences of all students. This must include a technique or process of evaluating the progress of the student. It obviously must be a process that stems from the philosophy of education that underpins standards-based education, which means being able to develop assessment methods that measure what students actually know and are able to do. There is value in examining the concept of authentic assessment as it is advocated to be used in all of education.

This process is designed to move teachers away from 'true and false' and paper/pencil responses and lead to assessment that is integrated with instruction as it is taking place and is focused on what students understand now and can do now. Grades are to be based on culminating knowledge and competencies rather than on averaging of test scores.

There is a swelling interest in authentic assessment, stemming from perceived inadequacy of the traditional methods of measuring students' knowledge. The argument is made that traditional method of testing does not allow for differences in the cultural and economic backgrounds of the students being tested.

"The proponents of performance assessment would say that traditional assessment relies on indirect or proxy items from which it tries to show valid inferences about a student's performance." (Wiggins, 1990, p. 1).

This, they argue, is too simplistic an approach, as it does not enter into the real life experiences of the student. But, authentic assessment encompasses the learning of a new skill or task by demonstrating the student's understanding of the concepts and the skill to develop the required technique. It is proposed that the traditional methods are weighted towards mainstream American pupils, i.e., white, middle-class and suburban. Consequently, a method of testing is sought that not only takes cultural and economic differences into the equation, but embraces these very differences and builds them into the method and process. Also, the argument of the new method goes on to say that there is evidence to show that with present testing methods, teachers are inclined to "teach to the test." This is confounded by the government's tendency to award funding based on the results of current national tests.

Authentic assessment is a form of testing that requires students to perform a task rather than select an answer from a ready-made list. This method is also known as alternative assessment, performance assessment, and sometimes portfolio assessment.

Comparisons can be helpful in understanding differences in testing approaches. The following contrasts, developed by Wiggins (1990), highlight important distinctions in the design and use of authentic or performance assessment and traditional tests.

1. Performance assessment requires students to be effective performers with acquired knowledge. Traditional tests tend to reveal only whether the student can recognize, recall what was learned.

2. Performance assessments present the student with the full array of tasks that mirror the challenges found in the best instructional activities; conducting research; writing, revising and discussing papers; providing an engaging oral analysis of a recent political event; collaborating with others on a debate, etc. Conventional tests are usually limited to paper-pencil, one answer questions.

3. Performance assessment ascertains whether the student can construct polished, thorough and justifiable answers, performances or products. Conventional tests typically only ask the student to select or write correct responses, irrespective of reasons.

4. Performance assessment achieves validity and reliability by emphasizing and standardizing the appropriate criteria for scoring such (varied) products with the use of a rubric; traditional testing on the other hand, standardizes objective "items" and hence, one right answer for each.

5. The validity of a test should depend in part, upon whether the test simulates real world tests of ability. Validity on most multiple-choice tests is determined merely by matching items to the curriculum content.

6. Performance tasks involve "ill-structured" challenges and roles that help students rehearse for the complex ambiguities of the realities of adult and professional life. Traditional tests are more like drills, assessing static and too-often arbitrarily discrete or simplistic elements of those activities. (Wiggins, 1990, p. 1-3)

What are the benefits of performance assessment? The positives of this form of testing include:

- leads to a change in curriculum and teaching techniques, ...spurs instruction in higher order skills;
- eliminates narrowing of curriculum as with standardized test use;
- responds positively to "teaching to the test" since teaching to the performance-based test will result in better instruction and curriculum;
- results in a greater understanding of the student's abilities than is provided by standardized type of test;
- contributes to advancement of teacher empowerment by expanding the participation of teachers in the development of performance assessment programs and by providing teachers with an active role in the scoring process for such alternative assessments; and
- holds promise for use in the restructuring process of urban-centered educational systems since alternative testing results in a greater understanding of the students' abilities than is provided by the standardized test. ("Student Assessment: A Review of Current Practices and Trends in the United States and Selected Countries", 1991, p. 12-13)

But as expected, if there are positives to an issue, there will also be negatives. Some of the cautions associated with authentic assessment include:

- considerably higher cost than with standardized testing;
- identified by some psychometric experts as less reliable and less valid than traditional tests;
- being asked to do too much since the new tests also will be used as an accountability system for individual schools and the district;
- necessitates that teachers will be required to teach in new ways, consequently requiring professional development and re-education;
- not useful to policymakers since they will be able to draw few conclusions about students' overall performance because only a relatively few number of tasks are used in performance evaluation;
- the cause of narrowing curricula in cases where the performance test may be restrictive, e.g., the production of a social studies docu-drama relating to a specific limited historical time period;
- more vulnerable to bias charges because performance assessments use fewer test items than standardized multiple choice tests and are therefore unable to "balance out" the unfairness of testing. ("Student Assessment: A Review of Current Practices and Trends in the United States and Selected Countries", 1991, p. 14)

Performance assessment requires students to actively demonstrate their knowledge, thus performance assessment may be a more valid indicator of students' knowledge and abilities. Performance assessment provides impetus for improving instruction and increasing students' understanding of what they need to know and do. Students will be able to judge their own work and change accordingly. (Sweet and Zimmerman, 1992, p. 1-5)

To implement authentic assessment across the curriculum will take effort, commitment, and resources. Agricultural Educators have the opportunity to provide leadership for the effort. First by ensuring that they focus on assessment in their courses that cause students to demonstrate what they know and can do and second by sharing with other teachers approaches for authentic or performance assessment. Helping all students in all subjects to identify what is expected and to be evaluated on what they can do can make a significant difference in the quality of American education and to the future of the nation.

References

Baker, E. L. (1990). Cognitive assessment of subject matter: Understanding the marriage of psychological theory and educational policy in achievement testing. (ERIC Document Reproduction Service No. ED 343 931). Center for Research on Evaluation, Standards, and Student Testing, Los Angeles, CA.

Student assessment: A review of current practices and trends in the United States and selected countries, (1991). (ERIC Document Reproduction Service No. ED 337 496). New York State Education Dept., Albany, Office for Planning, Research and Support Services.

Sweet, D. & Zimmermann, J. (Eds.) (1992). Performance assessment. (ERIC Document Reproduction Service No. ED 353 329). Education Research Consumer Guide; n2 Nov 1992. Washington, DC: Education Office of Educational Research and Improvement.

Wiggins, G. (1990). The case for authentic assessment. (ERIC Document Reproduction Service No. ED 328 611). Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

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Evaluating Knowledge in Agricultural Mechanics

By Richard Beard

The educational and industrial representatives which make up the National Agricultural Mechanics Committee includes members from throughout the United States. These members are the responsible for evaluating areas of technical agriculture. The seven members are elected for three-year terms to serve as associate superintendents with responsibilities in the areas of the event. Each area relates to a broad range of information and performance skills common to agricultural mechanics. The seven areas are:

1. Machinery and Equipment: Including repair and maintenance, materials handling, processing, and adjustments.

2. Industry and Marketing: Including customer relations, accounting, communication,service, sales, reading and interpreting regulations, safety, operating instructions, and manufacturer's recommendations.

3. Energy: Including mechanical power, electrical power, chemical power, wind power, solar power, engine operation, maintenance, trouble-shooting, and repair.

4. Structures: Including structures, storage, concrete, plumbing, construction, building materials, ventilation, masonry, heating, and air conditioning.

5. Environmental-Natural Resources: Including water quality, sustainable agricultural practices, soil and water conservation, and waste handling.

6. Team Activity: Working together, team members solve complex technical agricultural problems involving the five subject matter areas above. Using materials and equipment provided, teams prepare computer-generated solutions. Teams organize and plan, assign duties, and complete tasks, together or separately depending on the problem, individual skills, and knowledge.

7. Written Exam: The exam has 100 multiple-choice questions selected from a variety of sources. The exam parallels the subject matter emphasized in other areas of the event. It reflects current technological practices common to the agricultural production industry, requiring memory recall, information interpretation, and problem solving.

The National FFA publishes the general agriculture mechanics theme for each year well in advance. Utilizing each year's general theme and relying on suggestions from industry representatives and educators, the associate superintendents select several possible activities. During November of each year, this preliminary information is placed on the national agricultural mechanics Web site at http://web.missouri.edu/~pavt0689/natcon.html.

The themes for future years:

2001 - Animal Production

2002 - Materials Handling

2003 - Processing

2004 - Plant Production

2005 - Integrated Pest Management

During June each year, the Web-site is updated and details specific to the annual event are added. The required activities for all but the written exam may involve skill demonstration, "paper-pencil/computer" problem solving activity, or a combination of these evaluation techniques. The associate superintendents match each event area with available equipment and supplies. The decision as to specific subject matter evaluated is frequently governed by equipment availability, cost, and as sometimes happens, last minute cancellations or substitutions.

The scope of the national event is narrowed as associate superintendents secure commitments from manufacturers for equipment and supplies. In late August, the Web-site is again updated and team members and coaches are advised to periodically check the site for updates during September and early October. If an equipment substitution occurs or specific details are finalized, the associate superintendents may provide further updates.

The National Agricultural Mechanics Committee provides this information to students and teachers as a guide in preparing for the event. Scheduling the delivery of information in this manner accomplishes two goals. The major goal is to encourage teachers and students to begin studying theme content and skills from a broad prospective, then narrow the focus of learning to allow in depth mastery of the subject content later in the year. A lesser goal is to secure equipment and supplies from manufacturers and to reduce the frequency of last minute substitutions. It is the committee's wish that teachers will place emphasis on students learning how to learn, learning how to solve problems, and developing skills, rather than teaching for the agriculture mechanics competition.

Industry is the primary source used for identifying the technical content that is evaluated in the National FFA Agricultural Mechanics CDE. Industries that employ agricultural mechanics graduates of secondary and post secondary schools are frequently asked to provide a list of competencies needed for someone working in a technical agriculture profession. These competencies reflect many of the traditional skills common to agriculture mechanics curricula. Recommendations also include competencies that emphasize the interrelationships between the modern technology, the necessity for skill mastery that will transfer to many areas of production, and the importance of employees remaining up to date with industry advances.

A list of competencies (shown in part in Figure 1) was drawn from two sources and the recommendations were similar for the two groups. The industry representatives assisting with the CDE were one source and the second group was employers involved in a recent study conducted by Ryan Heger, an Agricultural Education graduate student at Texas A&M University. These attributes are applicable to all areas of this CDE and are competencies employees need for success in the work place.

Technological advances in America continue to influence the way students must prepare for their futures. Students entering the workforce need a strong knowledge base and the ability to comprehend the interaction of complex systems. Employers want productive workers and managers that can access and use a broad range of information. The most sought after employees are those who communicate effectively, continue to stay current with modern technology, and work successfully as individuals and as team members. Students with these skills and abilities are competitive in the job market, receive financial rewards, and are selected for advancement.

Each event activity is in response to problems or needs encountered in the real world. Solving such problems requires an understanding of how each decision or solution imposed on one component will influence the other system components. Solving one component of a problem without using a 'systems approach' can, and often does, result in additional problems. An example of where this has occurred is observed in the many obstacles that agricultural producers currently face regarding environmental pollution and stricter governmental regulations.

Agricultural advances have pushed the Internet to the top of the list as the best reference to use when preparing for this CDE. It is the intent of this national committee that the event activities reflect current technological practices common to modern agricultural production.

The National FFA Agricultural Mechanics CDE recognizes students with agricultural mechanics competencies important to the modern workplace. The technical content and skills evaluated continue to include the traditional areas of the agricultural mechanics curricula. Additionally, the operation of modern equipment, the application of new management strategies, and the mastering of advanced technologies are increasingly emphasized.

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Employers want employees that:

- § Are motivated to learn and have the ability to learn from various methods of instruction.
- § Are knowledgeable about all areas of computers.
- § Ability to calculate cost per units, per hour, per acre, etc.
- § Are able to effectively implement the use of technology in the workplace.
- § Have strong interpersonal communication abilities.
- § Can understand and apply principles of mathematics, economics, biology, and physics.
- § Can identify and interpret the correct resources to use in making an educated decision.
- § Ability to understand and follow detailed instructions.
- § Know how to use technology to maximize resources
- § Know how to write goals and objectives and measure the success or failure of such.
- § Understand business operation, management, accounting, and cash flow.
- § Know how to operate and service modern equipment.
- § Are familiar with on-board computer systems that monitor and report on equipment operations.
- § Know how to be productive and work in a productive manner.
- § Understand how to use a systematic approach to diagnose and solve problems.
- § Know how to diagnose problems and failures in electrical, mechanical, hydraulic, etc. systems.
- § Have experience with CAD software.
- § Understand mechanical systems such as friction, wear, mechanical advantage, gear design, etc.
- § Have people skills in dealing with customers, fellow employees, large groups, and supervisors.
- § Understand cause and effect relationships and can apply both logic and critical thinking.
- § Exhibit common sense and follow safe practices.
- § Understand agriculture, encompassing planning, production, marketing, and finance.
- § Understand how to measure/estimate value of equipment and make buying decisions.
- § Know how to plan and implement changes for business and industry improvements.

Formative Classroom Assessment: Learner Focused

By Barry L. Boyd

You've just finished grading the last exam and the results are in. More than one-half of the class did not pass the exam! Why didn't the students have a clear understanding of the material? You taught the material the same way that you always teach and it has always worked before. What went wrong? How do you find out what could have been done differently?

Classroom assessment refers to the broad area of monitoring the learning progress of students. Assessment ranges from the ninth-grade teacher who stops at a table to systematically observe students preparing an experiment to commercially produced achievement tests. In other words, assessment is the umbrella term that covers a variety of data collection methods used to evaluate educational outcomes (Chase, 1999).

The purpose of formative classroom assessment is to help teachers direct and redirect their instruction to improve student learning. There are often gaps between what was taught and what has been learned. By the time the instructor notices these gaps in knowledge and understanding, it may be too late to fix the problems. Formative assessment may point to a need for adjustment to the instructional strategy, and it can help identify students who haven't grasped the idea or concept.

Assessment Characteristics

Angelo and Cross (1993) identify several characteristics that define classroom assessment. First, classroom assessment is learner-centered. It is designed to improve the students' learning before the summative assessment occurs either by improving teaching or improving how the student goes about learning. Improving teaching may not always be necessary to improve learning. Sometimes the adjustments must fall to the student: improving study skills or developing their metacognitive skills. Classroom assessment can provide the information necessary to guide the teacher and student in making those adjustments.

Classroom assessment is teacher-directed. It respects the autonomy of teachers and depends on their experience and professional knowledge to determine what and who needs to be assessed.

Classroom assessment depends on the participation of students, making it mutually beneficial to both students and teachers. When students know that teachers are interested in their success as learners, their motivation is increased.

Classroom assessment is also context-specific. It is tailored to meet the needs of the teacher, the student, and the discipline being taught. It is important to choose the right classroom assessment technique to fit the situation.

Most important, classroom assessment is an ongoing process. This may best be described as a classroom feedback loop. The teacher uses multiple, simple assessment techniques to evaluate student learning. The teacher in turn, uses the information to provide feedback to the students on how they can improve their learning as well as how the teacher can improve his/her teaching techniques to improve student learning.

Finally, classroom assessment builds on existing good teaching practices by making it more systematic and effective. Integrating classroom assessment into the lesson plan allows for seamless curriculum integration.

Assessment Techniques

Formative assessment techniques allow the instructor to make immediate changes in the course to improve student learning. To determine which classroom assessment technique (CAT) is appropriate to use, the teacher must follow three steps. First, decide which CAT will provide the information needed to assess student learning. Each CAT is designed to give somewhat different feedback to the instructor. Second, implement the CAT. Third, respond to the feedback collected by making changes, if indicated, and providing feedback to the students (Huba & Freed, 2000). Following are several classroom assessment techniques that can provide feedback to the teacher about the student's learning of course materials.

The Minute Paper

This CAT is described by Angelo and Cross (1993) as one of the most frequently used classroom assessment techniques. The Minute Paper helps instructors determine how well students understand the material being presented. When using this CAT, the instructor should stop the class about five minutes early and ask the students to respond to the following two questions:

1. What was the most important thing you learned during this class?
2. What important question remains unanswered? (Angelo & Cross, 1993, p. 148).

Students are usually asked to respond on index cards or half-sheets of paper. Questions can be changed to collect any type of information the instructor requires, but the goal remains to have students respond to a few questions in a short time period.

Muddiest Point

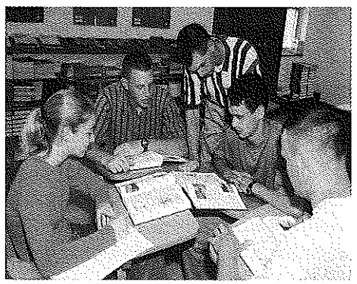
This is probably one of the easiest CATs because it only involves one question: What was the muddiest point in today's _____? The focus of the question may be an assignment, a project, a demonstration, or a classroom lecture. The goal is to clear up any "muddy" points before introducing any new concepts. If several students describe the same points, the instructor may need to modify how the information is presented to improve student learning (Huba & Freed, 2000).

One-Sentence Summary

The purpose of the One-Sentence Summary is to determine how well students can summarize information about a particular topic. The instructor focuses on a particular concept and asks the students to describe who does what to whom, when, where, how and why (WDWWWWHW) (Huba & Freed, 2000). Students should answer the questions in one long sentence. This CAT encourages students to focus on key questions when they read an assignment.

Application Cards

Application cards help students learn how a concept can be applied in the real world. Following a lesson, students are asked to write down on an index card at least one real-world application for what they have just learned. This helps the students connect new knowledge to its application (Huba and Freed, 2000).



Boyd stresses the need for ongoing assessment to determine if students are learning and understanding what is being presented.. Here, an agricultural education instructor at Chase High School in North Carolina guides a small group of students. Photo courtesy of Jasper S. Lee, Demorest, Georgia.

Approximate Analogies

Approximate Analogies allow an instructor to determine if students understand the relationship between two ideas or concepts. Students simply complete the analogy – A is to B as X is to Y. The instructor supplies the first half of the analogy and the students supply the second half. A leadership example might be, "ethics is to leadership as _____ is to _____." An example from animal reproduction might be, "body condition score in mares is to pregnancy rate as _____ is to _____."

The analogies are sorted into piles of "good, questionable, or wrong." Instructors choose samples from each pile to present back to the class, explaining why each sample fell into its respective category (Angelo & Cross, 1993, p. 193).

Turn to Your Partner

Turn to Your Partner (TTYP) helps improve student learning through reflection while providing the instructor with feedback about the students' understanding of the material. The instructor periodically asks students questions about the material, instructing them to formulate their own answer first. The instructor then asks the students to "turn to your partner". The pair discusses each other's answer to the question and formulates a new answer together. The instructor then calls on pairs at random to share their answer, thus gaining valuable feedback about students' understanding of the material (Huba & Freed, 2000).

Conclusions

Teachers of agriculture often teach the same way they were taught, usually through the use of lecture, demonstrations and labs to disseminate information and then giving tests to assess learning (McMahon, 2000). As the field of education transitions from a teacher-centered to a more student-centered approach, the use of formative evaluation in the classroom becomes increasingly important. The use of classroom assessment techniques (CAT) can help an instructor determine if their instructional methods are effective and what, if anything, can be changed to improve student learning.

References

Angelo, T.A., & Cross, K.P. (1993). Classroom assessment techniques. San Francisco: Jossey –Bass Publishers.

Chase, C.I. (1999). Contemporary assessment for educators. New York: Addison-Wesley Publishers, Inc.

Huba, M.E. & Freed, J.E. (2000). Learner-centered assessment on college campuses: Shifting the focus from teaching to learning. Boston: Allyn and Bacon.

McMahon, M.J. (2000). Student-centered learning in agriculture and natural resources at Ohio State University. NACTA Journal, 44(4). pp. 41-47.

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Evaluation of Student Learning in the 21st Century

By Carol A. Conroy

Since the early 1980s various education-related reports (e.g. *A Nation at Risk, New Directions*) have indicated that knowledge acquisition is no longer the primary prerequisite to success in the workplace or higher education. Along with the addition of various process skills, such as writing and speaking competence, to the typical school curriculum, teachers address important items such as working in teams and problem solving.

Higher-order (critical) thinking has also become more important as we continue to move away from a workforce of unskilled and low-skilled workers to one where individuals must possess the ability to transfer both knowledge and skills across many tasks. Central to the needs to change the content and delivery of instruction is the need to also change evaluation methods.

I propose that evaluation cannot be ignored or left until the "end" of an instructional cycle, but must be viewed as one component of a seamless approach to the planning, delivery, and evaluation of instruction. Evaluation should also be both formative (ongoing) and summative in order to develop a true sense of a student's thinking and learning.

√ *What is high quality evaluation of student learning?* As far back as 1933, educational researchers were trying to answer that question, and most agree that it is a technique and skill typically acquired through training, mentoring, collaboration with peers, and practice. A review of the literature on evaluation and assessment of student learning provides us with an overview of what Guskey (1994) called "Points of Agreement:"

√ *Grading and reporting aren't essential to instruction.* Teachers DO need, however, to check regularly on how their students are doing to determine what problems are being encountered. Grades and reporting are simply a measure of how well students are performing at some point in time. Both checking and grading are important to the teaching and learning process as they, together, allow teachers to become both advocates and judges, roles which may not be compatible (Barnes, 1985; Bloom et al, 1981; Frisbie & Waltman, 1992).

√ *No one method of grading and reporting serves all purposes well.* Grades can be used to serve a variety of purposes from reporting information to parents, providing incentives to students to learn, and to target students for specialized programs. Letter grades are brief descriptions of learning progress at a point in time; more detailed methods such as narratives and checklists offer specific information about progress, but are time consuming and may be difficult for parents and students to understand (Austin & McCann, 1992; Cangelosi, 1990; Frisbie & Waltman, 1992).

√ *Regardless of the method used, grading and reporting remain inherently subjective.* Research shows that subjectivity influences grading. Perceptions held by teachers of students' actions could impact their judgment and assessment of student performance. Teachers know their individual students fairly well and, as a result, can more accurately report what they (students) have learned. When there is a bias, however, this subjectivity can prevent deserving students from receiving the grades they truly deserve. School districts and teacher education programs need to provide training in how to recognize and deal with biases in order to ensure fairness in the grading process (Austin & McCann, 1992; Brookhart, 1993).

√ *Grades have some value as rewards, but no value as punishments.* Students view high grades as recognition of their success and hard work. No study supports the use of low grades as a means of punishment; instead of motivating students to work harder, low grades often have the opposite effect (Chastain, 1990; Selby & Murphy, 1992).

√ *Grading and reporting should always be done in reference to learning criteria, never on the curve.* While assigning grades based on the curve usually yields more consistency, it does little to promote effective learning. Students will compete for any high grades that the teacher may award; they can also perceive that helping one another will ultimately hurt them. Modern research tells us that any relationship between aptitude and achievement depends on the conditions of instruction, not grading on the curve. (Bloom, 1976; Johnson & Johnson, 1989).

There is no research to indicate that any one grading practice works best in all situations. In fact, observations of classrooms and assessment practices around the world have revealed several common problems associated with assessment:

1) Success is usually determined by the degree to which students remember and duplicate information and/or procedures they are taught in the classroom or through texts;

2) Standard assessment procedures do not indicate student understanding; and 3) Classroom activities are often NOT real investigations, focused on questions, and do not foster mind engagement. We have to make sure that our "hands on" activities are also "brain on." In the section below are some examples of emerging instructional practices and suggestions for how student learning can be assessed.

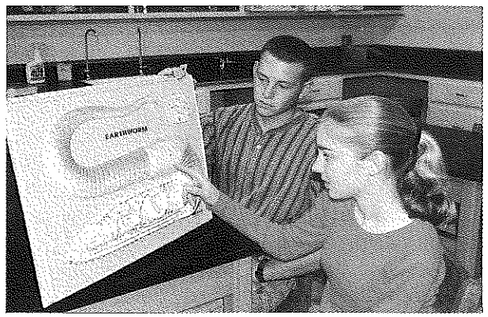
First, the process of inquiry is at the heart of emerging instructional reforms. Evaluating inquiry activities not only tests what students know, it identifies how they implement their knowledge in a new situation. Skills in observation, information gathering, sorting, classifying, predicting, and testing must be evaluated as well as the knowledge gained. Student reflective writing on the processes involved and what has been learned can be a more meaningful tool to assess learning than the typical objective test.

Of course, it will take longer to grade. Peer review is another tool for teaching that can be an effective evaluation technique, as well. Students should be comfortable submitting their work to questioning by others, to disassemble things and put them back together, and to reflect on how their conclusions were reached.

High-quality teaching and effective evaluation recognizes and builds on differences in the learning styles and abilities of students. Building on strengths and differences of students through cooperative learning exercises, portfolio evaluations, and the above-mentioned peer review is much more effective than the teacher's attempts to remove student weaknesses through the typical teach-test-reteach and retest method.

In summary, the effective agricultural education program of the 21st century must be focused on a vision of real learning. The instructional changes, including evaluation of students, need to ensure that this real learning is taking place. The new focus should be on concept mastery; use of inquiry/process skills; use of concepts and processes in new situations; creativity skills, including questioning, proposing explanations, and devising tests for the validity of explanations.

It is only through the adoption of a holistic approach to the evaluation of learning, and one that is developed in conjunction with our planning and delivery of instruction, that we can meet broad-based learning standards as well as the emerging needs of the workforce.



Conroy stresses that higher-level thinking requires the instructor to become creative in their instructional delivery methods. A resource-rich learning environment promotes student mastery in agriscience at Chase High School in North Carolina. Photo courtesy of Jasper S. Lee, Demorest, Georgia .

References

Austin, S. & McCann, R. (1992). Here's another arbitrary grade for your collection: A statewide study of grading policies. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Barnes, S. (1985). A study of classroom pupil evaluation: The missing link in teacher education. Journal of Teacher Education, 36(4):46-49.

Bloom, B. S. (1976). Human characteristics and school learning. NY: McGraw-Hill.

Bloom, B.S., Madaus, G.F., & Hastings, J.T. (1981). Evaluation to improve learning. NY: McGraw-Hill.

Brookhart, S. M. (1993). Teachers' grading practices: Meaning and values. Journal of Educational Measurement, 30(2):123-142.

Cangelosi, J. S. (1990). Grading and reporting student achievement. In Designing tests for evaluating student achievement, p. 196-213, NY: Longman.

Chastain, K. (1990). Characteristics of graded and ungraded compositions. Modern Language Journal, 74(1):10-14.

Frisbie, D.A. & Waltman, K.K. (1992). Developing a personal grading plan. Educational Measurement: Issues and Practices, 11(3):35-42.

Guskey, T. R. (1994). Making the grade: What benefits students. Educational Leadership, 53(2): 14-20.

Johnson, D.W. & Johnson, R.T. (1989). Cooperation and competition: Theory and research. Endina, MN:Interaction.

Selby, D. & Murphy, S. (1992). Graded or degraded: Perceptions of letter grading for mainstreamed learning-disabled students. British Columbia Journal of Special Education, 16(1):92-104.

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Using Standards and Benchmarks to Assess Knowledge

By James G. Leising and Seburn L. Pense

The quest for high quality evaluation and assessment of student knowledge and performance has been repeatedly addressed over the years. Without a clear framework of standards and benchmarks, gaps will persist in curriculum content and the quality of instruction will not be advanced.

Call for Standards

A Nation at Risk, published in 1983 by the National Commission on Excellence in Education, initiated the modern standards movement that called for reform in our educational institutions. It identified "a rising tide of mediocrity" in education that threatened the future of our nation (National Commission on Excellence in Education, 1983). In 1989, an Education Summit held by President George Bush and the nation's governors, established six broad goals for education, to be reached by the year 2000 (National Education Goals Panel, 1991).

In 1990, Congress established the National Education Goals Panel (NEGP) and the National Council on Education Standards and Testing (NCEST). These two groups were charged with identifing subject matter to be addressed, types of assessments to be employed, and setting standards of performance. These efforts led to the setting of national standards in mathematics, science, civics, dance, theatre, music, art, history and social studies, to name a few. Since 1990, the movement has taken hold at the state level with most states and U.S. territories having set common academic standards for students (Kendall & Marzano, 2000).

In 1995, Former Assistant Secretary of Education Diane Ravitch, credited as a chief architect of the standards movement, sums up the need for standards in her book *National Standards in American Education:A Citizens Guide (1995):*

"Americans...expect strict standards to govern construction of buildings, bridges, highways, and tunnels; shoddy work would put lives at risk. They expect stringent standards to protect their drinking water, the food they eat, and the air they breathe. ...Standards are created because they improve the activity of life."

While most content areas have already developed and repeatedly revised their content standards over the last decade, Agricultural Education has produced only two frameworks. Cardwell (1999) developed a framework titled the Food, Fiber, Environment and Natural Resources (FFENR) Matrix with the intent of providing a model that would connect elements of the life and physical sciences to human activities associated with FFENR systems. In 1998, Leising, Igo, and Hubert developed the Food and Fiber Systems Literacy (FFSL) Framework.

The FFSL Framework

A call was issued in 1988 for systematic instruction about agriculture to be given all K-12 students, establishing food and fiber systems literacy among our population (National Research Council, Board on Agriculture, Committee on Agricultural Education in Secondary Schools). In 1996, Oklahoma State University, in cooperation with the W.K. Kellogg Foundation, developed the Food and Fiber Systems Literacy (FFSL) Curriculum Framework. Themes, standards and benchmarks were identified and infused into the core academic curriculum using classroom activities that encouraged active learning. Through an infusion approach across the curriculum, development and testing of the FFSL Framework was carried out during the 1997-98 and 1998-99 academic years at elementary and middle schools in California, Montana, Oklahoma, and Pennsylvania.

A web-site was created to share what was learned through this project and is maintained by the Department of Agricultural Education, Communications, and 4-H Youth Development at OSU. It includes information about the project, a downloadable version of *A Guide to Food & Fiber Systems Literacy* (1998), as well as lesson plans and instructional activities. The web-site URL is: http://food_fiber.okstate.edu

Standards & Benchmarks

The FFSL Guide consists of two sections; the FFSL framework and sample instructional activities. The Framework section includes standards and grade-grouped benchmarks organized into five themes: 1) Understanding Food and Fiber Systems; 2) History, Geography, and Culture; 3) Science, Technology, and Environment; 4) Business and Economics; and 5) Food, Nutrition and Health.

The themes and standards describe what a person should understand to be agriculturally literate, while the benchmarks communicate developmentally appropriate aspects of each standard the students should achieve within each grade grouping. The first part of each benchmark is a minimum cognitive knowledge expectation. The second part is a psychomotor or affective expectation.

Assessing Knowledge

Standards are the foundation for teaching and learning about food and fiber systems, and can provide direction for school administrators, curriculum directors and teachers in planning infusion of food and fiber systems literacy education across the curriculum. Benchmarks, then, serve as a basis for instruction and assessment. As part of the Food and Fiber Systems Literacy Project, four assessment instruments for grade groupings K-1, 2-3, 4-5, and 6-8 were developed, based on the FFSL standards and benchmarks. These instruments were used as a pretest and posttest to measure change in agricultural knowledge of students in schools where the FFSL Framework was being infused across the curriculum in science, mathematics, reading and language arts. Results of field-testing, over two years in K-8 schools, revealed that students increased their knowledge of agriculture. Teachers perceived that students were more enthusiastic about their learning and more connected to their communities. Also, the instruments were useful in evaluating student achievement in each of the five thematic areas of the Framework. By using the instruments for diagnostic purposes, teachers were better able to focus instruction on themes where students needed additional instruction. Some may argue that tests do not measure all of the learning that is taking place. We would agree; but tests, when used as formative and summative measures, do provide a picture of what is being learned and the areas that need additional instruction. Also, we found that the results of assessment provide a vehicle for teachers to communicate to parents, school administrators and others about what students learned about agriculture. Together, the standards and benchmarks help to direct progress toward the goal of developing a food and fiber systems literate person.

Conclusion

A clear framework of standards and benchmarks will help to not only guide curriculum content and improve quality of instruction, but provide a basis for assessment of student agricultural knowledge. Has the time come to develop a national framework that would encompass those basic standards and benchmarks for instructing students in agriculture? The United States Department of Education is in the process of funding a project to determine the career paths and standards for vocational and technical education programs in agriculture (Dr. Larry D. Case, personal communication, December, 2000). Secondary school agricultural programs are vitally important in preparing individuals for employment in food and fiber systems, but in order to protect against gaps in the knowledge taught, and to be accountable for what students are learning, a truly standard-based curriculum in agriculture must be developed and implemented.

References

Cardwell, V.B. (1999). A matrix for connecting science and human activities in education: The food, fiber, environment and natural resource systems. Unpublished manuscript, Department of Agronomy, University of Minnesota, St. Paul, Minnesota.

Kendall, J.S. & Marzano, R.J. (2000). Content Knowledge: A compendium of standards and benchmarks for K-12 education, third edition. [On-line]. Available: http://www.mcrel.org/standards-benchmarks/

Leising, J., Igo, C., Heald, A., Hubert, D. & Yamamoto, J. (1998). A guide to food and fiber systems literacy: A compendium of standards, benchmarks, and instructional materials for grades K-12. Oklahoma State University, Stillwater, Oklahoma.

National Commission on Excellence in Education. (1983). A nation at risk: The imperative for educational reform. Washington, DC: Government Printing Office.

National Education Goals Panel. (1991). The national education goals report: Building a nation of learners. Washington, DC: Author.

National Research Council, Board on Agriculture, Committee on Agricultural Education in Secondary Schools. (1988). Understanding agriculture: New directions for agricultural education. Washington D.C.: National Academy Press.

Ravitch, D. (1995). National standards in American education: A citizen's guide. Washington, DC: Brookings Institution.

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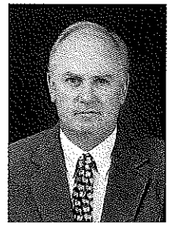

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Getting the Most Out of Power Point

By Ricky Telg and Tracy Irani

It used to be that there were only two sure things in life – death and taxes. Now there's a third: Power Point-supported presentations. Let's face it. Power Point is a way of life, considering that more than 90 percent of computer-based presentation visuals in this country are created using Power Point.

Picture this scenario:You enter a room where the lights are dimmed slightly. The speaker begins to address the audience and uses a projector to cast Power Point-created images from her computer. But you can't decipher much of the text on the projection screen. You spend most of the presentation trying to determine what the projected materials say, instead of listening to the presentation.

Sound familiar? Because computers and high-end projectors are becoming more commonplace in schools and universities, presentations like this happen all of the time. Poorly developed projected visuals distract your audience's attention from what's important – your presentation. This article details ways to make your presentations more effective by using correctly produced computer-generated visuals in PowerPoint.

Words, Words, Words

We've all done it, cramming two printed pages worth of material onto one PowerPoint slide. Don't. Instead, use pictures, clip art, or graphics. People remember pictures more easily. Using images also deters us from reading the material from our slides. But don't use images just to use images. If the clip art, photograph, or graphic doesn't further the audience's comprehension of your presentation, then don't use it. Include visuals that tell your story. However, if you have to use text, follow the next suggestions:

Number of words/lines: A good rule is to limit words to six per line and six lines per screen. Information is best presented using "bullet" points or key words.

Contrasting colors: The use of contrasting colors is an extremely important consideration. Use a dark background with light letters or a light background with dark letters. Avoid backgrounds with dark and light colors swirled together, such as Power Point's "Whirlpool" background template. Light-colored lettering is difficult to read when it crosses onto light backgrounds; similarly, dark-colored lettering is difficult to distinguish when it blends with a dark background.

Letter colors to use: Use white or yellow letters on a dark background or black letters on a white or light-colored background.

Letter colors to avoid: Red is the number one color to avoid, especially if you use a dark background. Red tends to bleed into other colors, making text difficult to read. Avoid colors that are similar to each other. For example, reds and dark greens are difficult to distinguish when projected.

Text size: Use a minimum font size of 32 points. Bigger (up to 48-point) is better.

Italics: On your office's computer screen, italicized words are easy to read. But when they are projected, audiences find it difficult to make out italicized words, so avoid italics.

Upper/lowercase: It is difficult to read all upper-case letters. A combination of lower-case and upper-case letters should be used.

Bells and Whistles

PowerPoint comes with lots of special effects for transitions between slides and for audio. The overall rule is to use special effects only when necessary. Special effects should have a purpose.

Audio effects: Use sparingly! Audio special effects can make a serious presentation seem humorous when it's not supposed to be. PowerPoint has such audio effects as a racing car, breaking glass, lasers, and a typewriter. Ask yourself: "Why do I need one of these effects?" If you can't answer the question with a meaningful reason, then don't use the audio effect.

Reveals and transitions: PowerPoint offers many choices of text reveals and transitions, ranging from text that dissolves onto the screen to text that "zooms" on from the right, left, bottom or top. Again, use sparingly. Your audience may get so enamored with the and transitions that they lose sight of the main points in your presentation.

Random effects: Avoid the use of "random effects" for reveals and transitions. You don't know how text will appear onto the screen in the "random effects" mode. For example, one of PowerPoint's effects is "crawl." If it is one of the chosen "random effects," you can expect to wait a long time for your bullet point of information to appear completely as it slowly crawls on the screen.

Environment: The presentation's site must be taken into consideration as you prepare your PowerPoint.

Preparation: Rehearse the presentation in the room you're going to give it. Make adjustments to the slides accordingly.

Lighted room: If a room's light level cannot be dimmed satisfactorily, try this: Use a white background with black or dark letters. Like traditional overhead projectors that have bright lights, a white (or extremely light) background projected through a high-end computer projector is more easily readable to your audience.

Clip Art, Anyone?

If your budget allows, buy a clip art CD-ROM. You don't have to get one of the 300,000-piece clip art collections. But get one that gives you more selections than the clip art that comes bundled with PowerPoint. You can also get free downloadable clip art images from several Web-sites, such as Microsoft's clip art page: http://www.microsoft.com/clipgallerylive/ For an extensive listing of clip art, check the August 1999 issue of Presentations magazine.And don't underestimate your own creativity.

Remember to keep the images easy to understand. Use bold, simple images.Background templates also are a factor in your PowerPoint presentation, so don't get caught using only PowerPoint templates. You can create your own using PhotoShop, or you can purchase templates on CD-ROMs, such as Vicious Fishes from Digital ArtWare.

Multimedia

Multimedia elements are becoming more common in PowerPoint presentations. A study of corporate trainers, reported in Presentations magazine, showed that 90 percent of respondents "almost always" or "occasionally" used animated transitions in their presentations, 86 percent used animated objects, 70 percent used computer video, 66 percent used sound clips, and 55 percent used musical scores. So do multimedia presentations increase students' comprehension?

According to a study conducted by 3M Company and Presentations magazine, multimedia presentations enhance people's ability to understand and process procedural or fact-based information only slightly better than overhead transparency slides. However, according to the same study, when it comes to persuading an audience, multimedia presentations win out, hands down. People perceive that information provided with multimedia presentations are more credible and persuasive than information provided by overhead slides.

PowerPoint in the Classroom

Power Point is undeniably a powerful tool when it comes to making a presentation, but there are some divided viewpoints and some considerations to keep in mind when considering the use of PowerPoint as a teaching tool. For example, Andrew Hoffman, writing in the October 2000 issue of T.H.E. Journal, a magazine focused on the use of technology in education, argues that, from the teacher's perspective, use of PowerPoint may be something of a trade-off. Although PowerPoint-based presentations are more portable, and can be saved for repeated use, they typically take longer to assemble than writing the same material on a blackboard or an overhead. Many creative K-12 teachers have been able to take PowerPoint to the next level in the classroom, designing presentations that focus on involving students. PowerPoint's ability to incorporate photos, graphics, animation, even sound and video, meshes well with the more visually oriented aspects of the agricultural curriculum, and this can be especially effective with younger children. Further, teaching older students how to use PowerPoint can be an effective method to enhance their presentation and organization skills.

The Bottom Line

Like any other teaching tool, effective use of PowerPoint requires that you have some goals and objectives in mind that presentation software can help you achieve successfully. And it goes without saying that training – knowing how PowerPoint works and what it can do – is important as well. The Web is a great resource for online tutorials and training on PowerPoint. One good site tutorial site that also works well with K-12 students is Act360 Media's "PowerPoint in the Classroom" tutorial, at http://www.actden.com/pp/index.htm. Another source of information on conducting effective PowerPoint presentations is Presentations magazine, free to educators. You can subscribe at http://www.presentations.com.

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Integrating Sustainable Agriculture into the Classroom

By David Williams

Advocates of sustainable agriculture visualize an agricultural industry that is economically sound, environmentally protective, and socially acceptable. In the past, an agricultural practice was frequently accepted or rejected by asking the question, Is it economically sound? A "yes" answer provided strong support for adoption, whereas a "no" answer supported rejection. But now there is a growing awareness that agricultural systems must work within more responsible boundaries and respond not only to economic criteria but also to environmental and social concerns.

Historically, economic principles have been integrated into the agricultural education curriculum to a greater extent than have environmental and social aspects. Concurrent integration of economic, environmental, and social factors into the agricultural education curriculum encourages a multidisciplinary approach to learning in and about agriculture that parallels emerging developments in agriculture.

Dimensions

Sustainable agriculture can be visualized as overlapping economic, environmental, and social dimensions. The economic dimension is concerned with profitability, giving special attention to supply-demand balance, global competitiveness, government policies regarding price supports for farm commodities, and technology. Shifts in food consumption relating to the diet and health of consumers, food quality and safety, and marketing of agricultural products also are addressed (Council for Agricultural Science and Technology, 1988).

The environmental dimension of sustainable agriculture is embedded in the fact that natural resources, along with science and technology, serve as a base for the agricultural industry (Stansbury and Coulter, 1986). The United States has a strong natural resources base, but new technologies and sound conservation practices are needed to extend its viability.

From a social perspective, the desired outcomes of sustainable agriculture include providing a safe, abundant, and nutritious food supply at a reasonable cost while preserving the wholesomeness of our rural heritage. The impact on society and not just on the farmer, consumer, or agency immediately affected is among the desired outcomes. For example, application of pesticides significantly benefits producers and consumers in many instances, but residues from pesticides may cause health concerns.

Basic to these three dimensions of sustainable agriculture are sound agronomic principles; issues related to chemical fertilizers, pesticides, and animal waste management; integrated pest management; and issues related to biotechnology. Precision agriculture is complementary to sustainable agriculture in that both use a systems or interdisciplinary approach to decision-making.

The central concept of sustainable agriculture is to bring about an expanded way of thinking and decision-making in the agricultural industry. The following are among the beliefs paramount in this endeavor:

- Science and technology are the base of the food and fiber industry.
- Natural resources are critical to the food and fiber industry.
- Decision-making is based on economic, environmental, and social factors.
- Food and fiber can be produced more responsibly.
- Application of sound agronomic principles is crucial.
- Technologies are becoming more integrated and multifunctional.
- Changes in agriculture impact both rural and urban communities.
- The agricultural industry is globally interdependent.
- The public monitors the environmental and social impacts of agriculture.

Curriculum Enhancement

The beliefs regarding sustainable agriculture listed in the previous section should be examined and, if agreed on by local stakeholders, infused into the program philosophy. Philosophy serves as a screen to select subject matter (what to learn) and student learning activities (how to learn) and supports the development of learning partnerships (with whom to learn).

Teachers are challenged to identify students' current level of sustainable agriculture knowledge and to select learning opportunities that will help them achieve a higher level. Concurrently asking the following questions in decision-making situations provides a multidisciplinary approach to learning that will support the quest toward a sustainable agriculture:

- Is the agricultural practice or system economically sound?
- Is the agricultural practice or system environmentally protective?
- Is the agricultural practice or system socially acceptable?

Agricultural education programs can help prepare future agriculturists for work in a sustainable agriculture industry by carefully considering what to learn, how to learn, and with whom to learn.

What to Learn? Recognizing the lack of information and management skills as a major barrier to the adoption of sustainable agriculture, Pretty (1995) advocated that a greater diversity of agricultural practices, along with more emphasis on resource-conservation technologies, be included in the curriculum. Examples of sustainable agriculture content integrated with more traditional topics in the agricultural education curriculum are the following:

- Agronomy, including agroecology, weed management, efficient use of on-farm and purchased inputs, biological principles, soil development, and soil organisms.
- Integrated Plant Nutrition, including fertilizer use tailored to each field and crop, use of manure, management of synthetic chemical use, crop rotation, agroforestry, and precision agriculture, e. g., global position system (GPS).
- Integrated Pest Management, including resistant varieties and breeds, alternative natural pesticides, releasing predators and parasites, and precision agriculture, e. g., crop scouting and record keeping.
- Animal Science, including sustainable livestock production systems, livestock manure management, grazing management, and combining aquaculture with the production of crops.
- Marketing, including food quality and safety issues, global competitiveness, and marketing of products produced under conditions for targeted populations.
- Communications, including dialogue between rural and urban communities; between the agricultural sector and the general public.
- Natural Resources (soil, water, air, and wildlife), including soil erosion control, contour farming, of wildlife habitat, filter strips, and the minimization of air pollution .

How to Learn? Agricultural education has unique features that facilitate learner-centered education and the integration of sustainable agriculture into the curriculum. Suggestions for using these features to enhance learning in sustainable agriculture are outlined here.

- Classroom/laboratory – involve students in making decisions about agricultural practices using the three questions listed previously and plan for learning through SAE and FFA.
- SAE – practice sustainable agriculture in hands-on learning settings.
- FFA – apply sustainable agriculture principles in career development activities.
- School Based – tie sustainable agriculture issues to learning in other subjects.
- Community Based –analyze sustainable agriculture systems used in the community.
- National Interactions – research sustainable agriculture systems used in other states.
- International Connections – feature sustainable agriculture in international exchange visits.
- Technology – use computers to gather and process information about sustainable agriculture.

With Whom to Learn? The increased emphasis on learner-centered education and the multidisciplinary nature of sustainable agriculture provide a wide range of people with whom students can learn.

- Teachers – serve as directors of learning, encourage wider student involvement, and facilitate decision-making skills that consider the three questions asked in this paper.
- Students – cooperative (group) learning encourages multiple perspectives and stimulates critical thinking.
- Parents – home provides a setting where students can test their ideas and apply sustainable agriculture practices in their SAE programs.
- Employers – community organizations (farms, businesses, and agencies) can provide students with hands-on experiences in problem solving and using sustainable agriculture practices.
- Researchers – partnerships with university or industry specialists can engage students in sustainable agriculture research projects and demonstration plots.
- Mentors – connect students with people using sustainable agriculture systems, facilitating interaction for continuous learning.

The integration of sustainable agriculture, using learner-centered activities, can enhance the agricultural education curriculum. Such action not only impacts *what to learn*, but more importantly *how to learn* and *with whom*.

References

Council for Agricultural Science and Technology. (1988). Long-term viability of U. S. agriculture. Ames, IA.

Pretty, J. N. (1995). Regenerating agriculture: policies and practice for sustainability and self-reliance. Washington, D. C.: Joseph Henry Press.

Journal Paper No. J-18666 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa, Project No. 3488, and supported by Hatch Act and State of Iowa funds.

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From Inkwells to Electronic Learning Communities

By Dwayne Cartmell and Jim Dyer

A century ago, teachers taught handwriting in elementary schools with the fountain pen, the prescribed writing instrument of the time. Desks had inkwells in the upper right-hand corners. The ballpoint pen was introduced in 1938, however, many students were forbidden to use the ballpoint pen in those early years because teachers felt it represented a passing fad. Teachers insisted that students be taught to write with a fountain pen so they would be equipped with the necessary skills for success in life. Also, it was believed that ballpoint pens would never be accepted since they represented too huge of a technological leap for students at that time. Sound familiar?

In the early 1980s, computers made an entrance into the educational setting. However, many teachers in the early years of the computer discouraged the use of this technological tool for doing homework assignments. Many students used a computer for word processing of an assignment and then transcribed the information in hand writing to meet teachers' requirements. The current status of technological delivery systems and electronic learning communities is leading to situations analogous to these examples. When students first turned in writing assignments citing sources from the World Wide Web, it alarmed many teachers. Even though they prided themselves on embracing new technology, in reality many could not conceptualize a library beyond the traditional brick and mortar foundation.

The same can be said for courses offered via the Internet, satellite television, or similar technologies. Many teachers still do not believe that a degree can be sought without ever attending a class on campus or sitting in a classroom.The pervasiveness of technology, such as the Web and email, has enabled us to reach all corners of the world, yet making it more personal at the same time. However, many agricultural education programs around the country – secondary and post-secondary – are still lacking in classroom technology. Tools like film projectors, chalkboards, overhead projectors, flip charts, and slide projectors still dominate many agricultural education settings. These delivery systems are not negative, but those programs utilizing only these limited resources are impeding students from growing into the basic foundation of their livelihood. New basic delivery methods exist that should be prevalent in all classrooms. Today's classrooms are ill-equipped if they do not have available such items as computers, Smart boards, Elmos, computer presentation programs, satellite television feeds, Internet access, and other similar technologies. What are future opportunities for technology in agricultural education classrooms? The best answer may lie in our ability to reach populations not currently being served. Nearly 55% of Iowa high school agricultural education students have no access to agriculture courses. Approximately 60% of the students in Missouri and 70% in Illinois have no way to enroll in agriculture classes. In Iowa, many school systems are so small they cannot afford to hire a full-time agriculture teacher – and the distance between schools makes driving from one school to another an impossibility during school hours. In Illinois and Missouri, most of the deprived students are in larger cities. Administrators are reluctant to commit the resources necessary to implement a full-time agriculture program. Technology may provide us the unique opportunity to reach students that, in the past, have been unreachable with messages about agriculture - through distance learning. Too often, we fail to utilize the technology available to us before it is obsolete. For example, why do agriculture programs still use paper record books in teaching students how to maintain and utilize records? Are we preparing students in the most advanced manner? Are we preparing our students for the real world? There are virtually no businesses today that maintain records using paper and pencil techniques.

We are teaching an MTV generation of students. Bringing technology to the forefront of our initiatives and giving our students the education they need in the most meaningful way to them is the best formula for preparing students for life. Otherwise, we may as well be using inkwells and slide rules.

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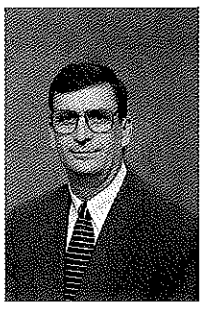

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