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RESOURCES FOR TEACHING

The Use of Appropriate Resource Materials

By *Jamie Cano*

Real-life experiences provide the most direct type of learning, but they are difficult to supply in the traditional classroom. Most experiences in the classroom occur through verbal symbolism – written and spoken words. These classroom experiences may be easier for teachers to supply, but they may be more difficult for many students to understand. Verbal symbolism depends on the ability to conceptualize and think in the abstract, while the impact of firsthand experience is immediate and concrete. Various multisensory resource materials – texts, pictures, games, simulations – can substitute for firsthand experiences and enhance understanding, so they are an integral part of the learning activity.

Regardless of the type of resource material to be used, a teacher must consider it in light of the purpose of the learning activity. The resource material must be suited to the objective and purpose – whether it is subject matter mastery, skills improvement, or valuing. Although resource materials can stimulate and maintain student interest, they are not meant merely to entertain the students. Unless students are properly guided, they become distracted by the attention-getting aspects of the resource materials and lose sight of their educational significance.

The more senses that are involved in the learning process, the easier it is for the student to learn. Differences in learning styles must also be taken into account. Some students can learn a body of information by simply reading an assignment or listening to the teacher; others need additional stimuli and experiences involving hearing, see-

ing, and manipulating the subject matter.

The experienced teacher will be able to use a variety of resource materials in a multimedia approach in any subject to vary the learning experiences. All students have different interests and abilities that determine what they attend to and learn. But what they learn also depends on the ability of the teacher to capture their attention and spark their interest through the use of appropriate resource materials.

The need of each learning situation determines the resource materials the teacher uses. Here are some general considerations, however, that can help in estimating their value and appropriateness.

■ *Interest* is the extent to which the student's curiosity is aroused and sustained by the use of the resource material.

■ *Relevance* is the degree to which the experience provided by the resource materials is related to the student's personal needs or goals.

■ *Expectancy* is the degree to which the student expects to succeed at the learning and sees success as being under his or her control when using the resource materials.

■ *Satisfaction* is the level of outcome and the student's satisfaction in performing the tasks.

Just what instructional materials a teacher uses depends on his or her knowledge and experience, the availability of the materials, the lesson assignment, the subject, and the students.

Here are some basic guidelines for their use.

■ *Purpose*: ask yourself what you are trying to accomplish and why this resource is important

■ *Definition of objectives*: Clearly defined objectives are essential for planning the lesson and selecting the resources.

■ *Flexibility*: The same resource can satisfy many different purposes.

■ *Diversity*: Use a variety of materials, media, and resources to develop and maintain student interest.

■ *Development*: Resource material must be related to the age, maturity, ability, and student interest.

In conclusion, resource materials are made for situations in general; it is the teacher's job to tailor them to the needs of the students.



Jamie Cano is an Associate Professor at The Ohio State University and is Editor of The Agricultural Education Magazine.

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Oral Reasons for Textbook Judging

By Will Waidelich

“I placed the Textbooks 3-1-4-2.”

“I started the class with 3, the smoothest, easiest to read in the class. Ideally, I would like to see it longer and more detailed! Even so, I used 3 over 1, as it was a larger size, meatier content with more potential for growth textbook. It was a strong textbook, high reading level that has more student activities, with more depth and natural binding down its side and through all portions of the binding. In addition, it appeared to have a higher page count. However, I do admit that 1 was a more gender-neutral, being more refined about its design, longer chapters, and laid in smoother about its spine, but it was shallower in content, shorter in length with a weak binding.”

Introduction

While this is obviously a spoof; what would be the steps that you might go through to make your decisions? What criteria would you use to select the types or kinds of products you might consider? Where would you start? Who is your audience? What are your objectives? Which methods, media, and materials will you and your learners use? How can you and your learners make the best use of the materials? How will you get your learners involved in the learning? How will you evaluate both the learners and your instruction? And how should you revise if you do that presentation again?

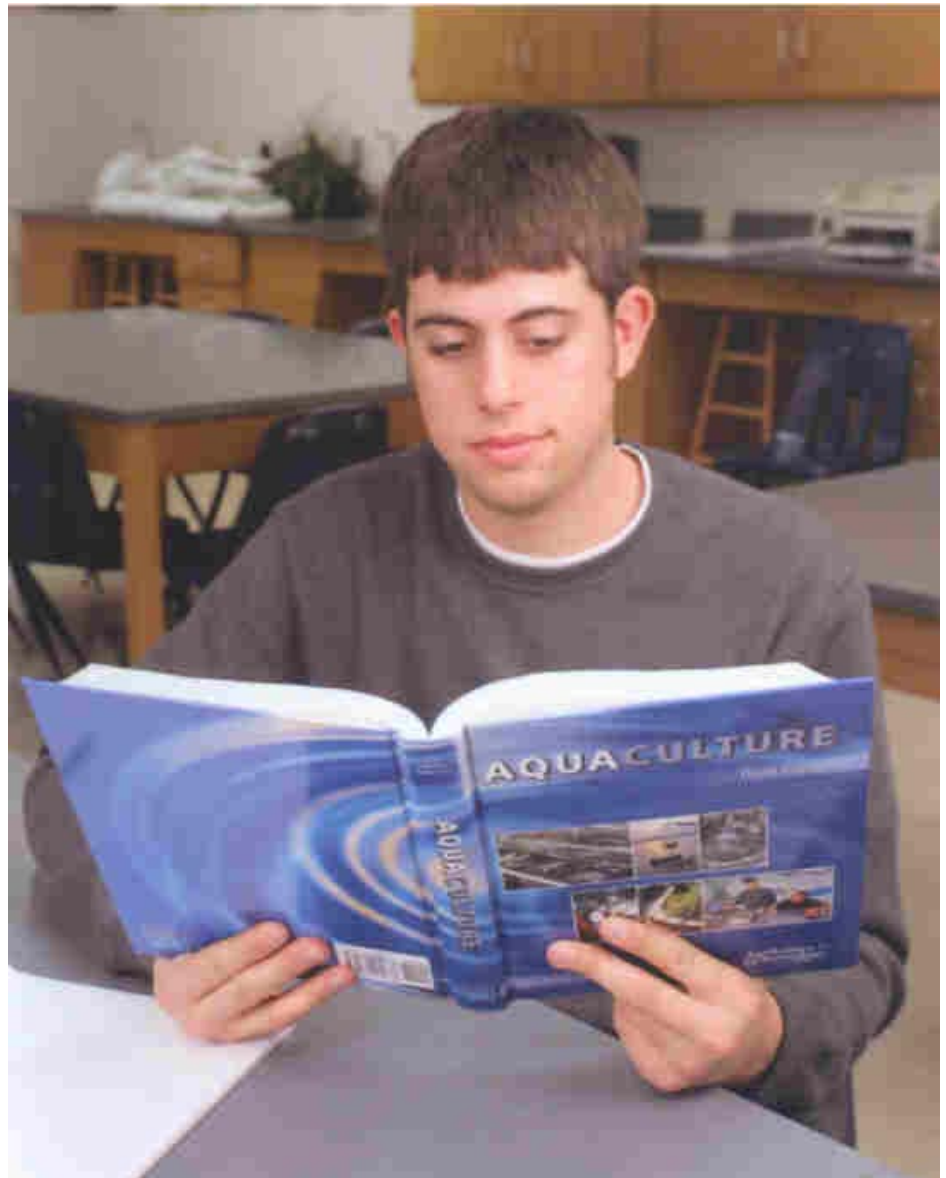
The September-October, 2005 issue, “Resources for Teaching,” of “The Agricultural Education Maga-

zine” will look at the resources available for teachers. The previous issues for 2005 addressed the science of teaching (psychological stuff), the mechanics of teaching (things teachers need to do before entering the classroom), the art of teaching (actual delivery of the instruction), and the assessment of teaching and learning. This issue will incorporate information on resources into each of the prior theme issues.

As the Theme Editor for this is-

sue I was working with individuals to write articles about where to find resources to use for teaching, and maybe some examples from experienced teachers who have successfully incorporated “resources” into their lessons. The bottom line was to let agricultural educators know what resources are available out there for them to use to make their teaching jobs much easier.

The first three articles discuss methods that agricultural educators can use to find, evaluate and use resources.



The next three articles analyze some resources that are available to agricultural educators and discuss the merits of these resources. The final article describes ways to use resources more actively.

An Exercise

An exercise that I use with new and beginning teachers is to set up a role-play strategy, where I give everyone a scenario. The scenario is that they are an agricultural educator in a local school, possibly where they plan



on student teaching. In the scenario the principal delivers a message that states that he or she has \$3000 available for the agricultural education department to purchase new resources for teaching. However, the principal needs a list of the items by the end of the day.

What goes through your head at this point? “This teacher is really lucky. I can’t get that much money for my program.” “How am I going to I decide what I need in just a few hours?” or “This is going to fun.”

When working with agricultural educators, I have found the ASSURE model from *Instructional Technology and Media for Learning* by Smaldino, Russell, Heinich, & Molenda (2005) very effective in helping agricultural educators plan learning experiences. The six-steps in the ASSURE model are meant to be used by an individual instructor when planning classroom use of media and technology. Information

about this model can be found at: www.prenhall.com/smaldino.

The ASSURE Model

- Analyze learners
- State objectives
- Select methods, media, and materials
- Utilize media and materials
- Require learner participation
- Evaluate and revise

The theme of this magazine is devoted to the third step: “Select methods, media, and materials.” Smaldino, Russell, Heinich, & Molenda (2005), provide ten different selection rubrics for this step. These selection rubrics provide a systematic processing for “judging” the qualities of specific materials. Selection rubrics are available for:

- Simulations and Games
- Computer Software
- Multimedia
- Web Resources
- Printed Materials
- Visuals
- Audio Materials
- Video
- Audiovisual Equipment
- Computer Hardware

Most of the selection rubrics are available at the textbook’s companion website: www.prenhall.com/smaldino.

These selection rubrics provide a rating system for “judging” how well a particular resource; whether a textbook, DVD, or a website; will meet the criteria. The “judging” criteria include accuracy of content to amount of learner participation to legibility to evidence of bias.

The next time your principal asks how you might use \$3000; you might be able to respond more succinctly. Additionally, you might be able to justify even additional purchases by using the selection rubrics.

How will you score on the your next class of oral reasons for textbooks?

References

Smaldino, S., Russell, J., Heinich, R., & Molenda, M. (2005). *Instructional Technology and Media for Learning*, 8th ed. Upper Saddle River, NJ: Pearson Education, Inc.



Will Waidelich is Director of the Curriculum Materials Service, The Ohio State University

Harnessing the Power of the Internet

By Clark Harris

Information is everywhere. The Internet is a virtual warehouse of information. But finding the information may seem like looking for a needle in a haystack. Teachers should continue to improve their Internet search skills and learn to sift through the information. Teachers can then help their students find meaningful information on the Internet.

The Internet has information mega sites that contain tremendous amounts of resources such as the 250,000 pages from extension and agricultural experiment station sources on the e-Answers Web site. There are thousands of agricultural related photos available for free use from USDA, NCRS, ARS, NOAA, etc. The Georgia Agricultural Education Web site has vast resources, including excellent national and state FFA CDE information. And over 650 agriculture-related PowerPoints are available free at the Glen Rose FFA Web site.

Besides the mega sites, many sites have extensive agricultural links such as Agripedia, the KSU Agricultural Education Links pages, and the Texas New Agricultural Teacher Resource Center. But most content is found on smaller, less organized Web sites. The sites must be searched to find this information. Enhancing Internet search skills can help the agriculture teacher find the great resources available on topics such as food science, meats identification, precision agriculture, and embryo transfer.

The materials that teachers need are on the Internet. The question is

whether the teachers and their students can find the materials. Many of those resources are free or are available for a reasonable fee. Most states have made their Cooperative Extension Service bulletins available online. This greatly increases the chance of finding the type of bulletin that is needed. Oklahoma State University has a breeds of livestock page with descriptions, pictures, and links to over 925 cattle, sheep, swine and horse breeds. Several greenhouse management handbooks and plant databases with over 7,000 entries are available on the Internet. Students can also find agricultural census data, historical agricultural photos, breed and industry organizations, agricultural magazines and newsletters, and much more. Knowing how to find the resources is the tough part.

Where to Start

Start a search with a good search engine or directory. Google

(google.com) is the largest (Barker, 2005 & Barker, 2005), most popular search engine available and is a great place to start a search. Nielsen (Sullivan, 2005) reported that 48% of Web searches, in May 2005, were done with Google-branded search engines. People used Yahoo-branded search engines for 21.2% of the searches. Yahoo-search is actually a directory. Search engines have "spiders" to search Web sites to find the information that matches a search. Directories actually have people search Web sites and categorize the sites into directories. Directories may give more focused results. If very few results are found then try using two or three search engines and compare results.

When searching with Google, or any other search engine, take care in selecting key words to search. Think about the topic. What kind of pages or information is wanted? What kind of pages do you not want to find? The first key word listed is generally given the

January - February 2006 Issue

Theme: *Motivating Students to Learn*

How do you as a teacher make the classroom come alive? This issue of *The Magazine* will focus on helping teachers motivate students. Questions such as: How do I get students excited about learning?, How does one motivate students using brain-based learning models?, and, How do teachers keep up their energy in an effort to keep the classroom motivation going?, will be answered.

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most weight in the search. Try to select words that will help paint the picture of what you are searching for. Consider synonyms that may help to produce links to Web sites, such as when searching for cattle use the terms cattle, bovine, cows, steers, beef, etc.

**Google is
the largest,
most popular
search
engine
available**

Boolean Searches

Some search engines take advantage of Boolean logic (fig. 1) in their searches. Boolean logic uses terms such as AND, OR, NOT, or NEAR to narrow or expand searches. When using Boolean logic type the word that will shape the search in capital letters. When the word AND is put between two words, the search includes only Web sites with both words. An example might be to use “bucks” AND “rabbits.” This search would look for sites that only use both words bucks and rabbits. It would then narrow your search to reduce sites about deer, dollars (bucks), broncos, and antelopes. It would also reduce the sites about rabbits that don’t discuss bucks.

The search term OR will find all sites that use either word. This is a

good place to use synonyms such as cattle OR bovine, build OR construct, or greenhouse OR hothouse. This is a good way to help expand the search. Users can string synonyms together such as “bovine OR cattle OR beef OR cows” to broaden the search to include any type of reference to cattle.

NOT is a term used to exclude content. Users can use “greenhouse” NOT “global warming.” This type of search would reduce the number of sites that refer to global warming, greenhouse gases, etc. NOT could also be used it when looking for Web sites that are about pigs, but not about pot-bellied pigs (pigs NOT “Pot Bellied Pigs”). Sometimes this search method is done as AND NOT.

Advanced Search Features

Improve search results by using “advanced search” features. Both Google and Yahoo-search have advanced search features that allow users to narrow or expand searches, combining many of the good features of Boolean searches and Internet math at the same time. Advanced searches allow users to qualify the search to...

- include “all” terms
- include an exact phrase (Quotation marks around a phrase can give similar results)
- include “at least one” of a group of words
- exclude words

As an example a search with the phrase “embryo transfer,” and at least manual or handbook provided 3, 370 sites, with the first one being a manual on embryo transfer in cattle from FAO. Many times it is helpful to search for a specific title of a bulletin, article, etc. using quotations around the title. Ad-

vanced search features also allow users to limit searches ...

- with only certain file formats (or not formats) such as pdf, jpg, or doc.
- only from specific domains (or not domains) such as .gov, .edu or .com
- updated since a certain time to get timely information

Google and Yahoo-search also both allow searching for images, news, and much more. You can use the advanced search features to help locate specific types of images. The image search (techniques AI OR “artificial insemination”) had both a drawing and photo of artificial insemination in the top ten images. Be careful when searching images. There is a possibility of accidentally finding inappropriate images.

As teachers and students improve their search skills they will be able to find better information faster. This will give them the time for those other important activities involved with teaching and learning agricultural edu-

**When using
Boolean
logic, type
the word that
will shape
the search in
capital
letters.**

cation.

All of the Internet sites discussed in this article can be accessed from the Kansas State Agricultural Education Web site at <http://coe.ksu.edu/ageducation/links.html>.

Selected Websites

- Agnic http://www.agnic.org/agnic/index_html
- Agripedia <http://www.ca.uky.edu/agripedia/>
- e-Answers <http://e-answers.adec.edu/>
- Georgia Agricultural Education <http://aged.ces.uga.edu/>

- Glen Rose FFA Chapter <http://www.glenroseffa.org/lesson%20plans.htm>
- OSU Livestock Breeds <http://www.ansi.okstate.edu/breeds/>
- Texas New Agricultural Teacher Resource Center <http://www.depts.ttu.edu/agriculturalteachers/>
- USDA Online Photography <http://www.usda.gov/oc/photo/opcphsea.htm>
- USDA ARS Image Gallery <http://www.ars.usda.gov/is/graphics/photos/>
- USDA NCRS Photo Gallery: <http://togallery.nrcs.usda.gov/>

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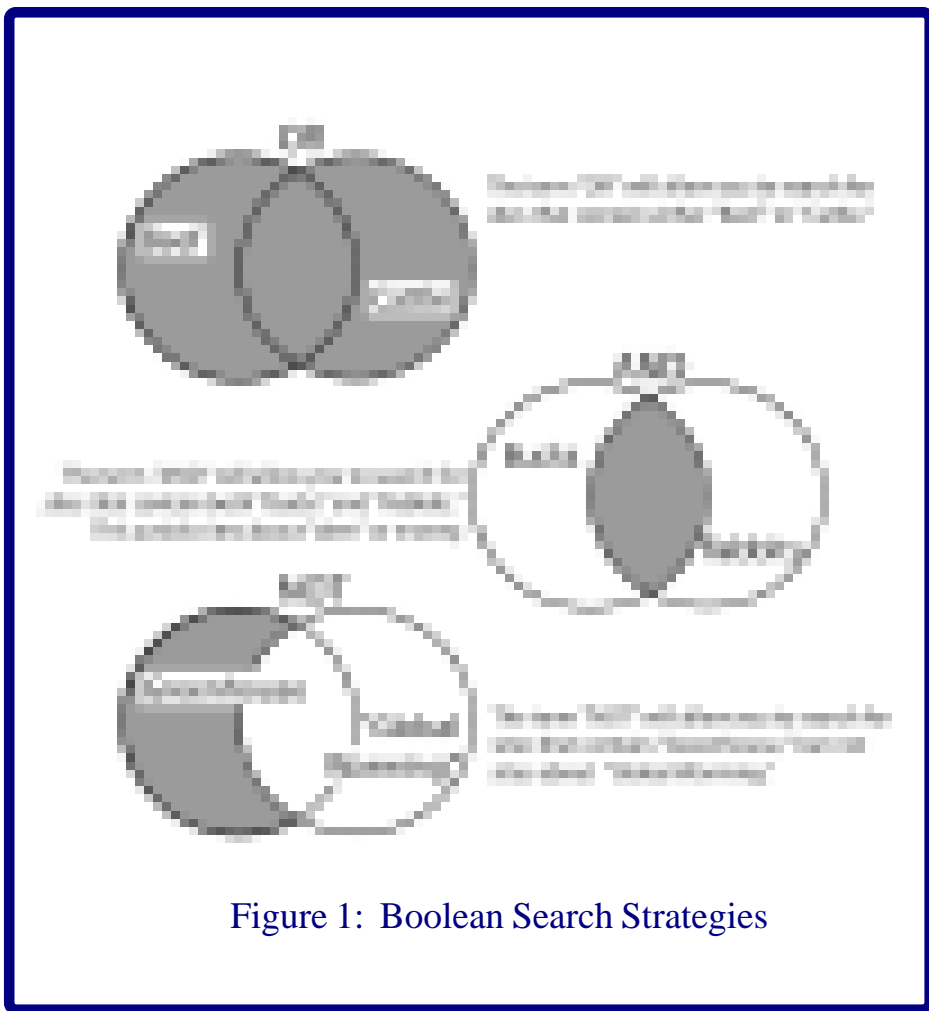


Figure 1: Boolean Search Strategies



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Computer Games for the Agriculture Classroom

By *Aden Kuenzi*

How do teachers keep their students' attention to help them learn at their maximum potential? How do teachers instruct their students so that when they depart the four walls of their classroom, they have a very good idea of what is facing them in the real world and have the tools to be successful? Although I'm not a teacher by profession, I am certain that teachers must often grapple with these questions. They are undoubtedly questions as old as the Socratic teaching method.

While I am not a teacher, and therefore cannot speak with authority on the latest teaching methods and techniques, I did spend 16 years of my life in the classroom. During that time period, like most of us, I came under the tutelage of all kinds of teachers—some were outstanding, and some were not. Those teachers that stick out in my mind as being outstanding all possessed at least two traits: (1) They had a keen ability to make even the duller material come alive in my mind—it became “fun” to learn, and (2) they connected my learning as much as possible to real life. Now I am in a career of public accounting. As I look back across the years of my schooling, I have all the more respect for those teachers that went out of their way to help make a connection between the classroom and real life.

Who among us doesn't like to play a game? What better way could there be to stimulate a person's mind while having fun at the same time? Games were used rarely in my schooling, much

as I wished it were otherwise, but as often as they were used, they had a big impact on me, and it made the learning fun. My first ‘gaming experience’ came outside the classroom when I and my siblings received *The Farming Game* as a present for Christmas. I literally wore the game out. If I couldn't find somebody to play it with me, I played it on my own anyway for hours at a time. It wasn't apparent to me at the time, but this was my first schooling for real life, my first schooling on the entrepreneurial spirit that drives our nation's economy. This game, in its own small way, forced me to think and make decisions like a business person. This game very simply taught me that there is a cost to borrowing money called interest. It didn't use those words, but that's one lesson I learned playing the game. It was a lesson I learned years before I was formally taught in the classroom.

Computer games were not available when I was younger, but the marching advance of technology has brought many of them to the marketplace. Some have even been created with a specific focus on agriculture. It has been a hobby of mine to search out agriculture-related games, particularly those that require the player to make business-like decisions. I am convinced that some of these games would be useful in the classroom in helping develop those two traits of an outstanding teacher, and in helping students have great enjoyment in their learning. Exactly how they should be implemented in a classroom setting is beyond the scope of this article. Suffice it to say, there are some very creative agriculture-related computer games available, each with their own set of strengths and

weaknesses. I have personally spent hours playing these games and am happy to share them with you in the hopes that some teacher would consider using them to liven up their classroom. In Table 1, I summarize the six agriculture-related computer games I have played and reviewed. My comments are based on my experiences as an agricultural computer game connoisseur and public accountant.

While more could be said about each game, space constrains me. Each could be used in some manner in the classroom. I would be hard pressed to pick a favorite, but *Stake Your Acres* has been the most challenging to me. Which product will work best in your classroom will undoubtedly vary, depending on the age level of your students and your goals as a teacher. This review is not a comprehensive population of every business-oriented computer game; I have kept my focus on computer games for the agriculture classroom. The idea is simply this: Computer games can provide a wonderful opportunity to energize students all the while teaching them important economic lessons that will be useful to them in real life. Actually, pursuant to that endeavor, the closest I've seen anyone come in making use of games in the classroom is Dr. Neil Knobloch and his *Reap* product, which teaches kids economic lessons and basic principles of accounting using *The Farming Game*. I applaud his efforts, and wish I could have had that opportunity when I was a student.

Aden Kuenzi is a Certified Public Accountant for Kuenzi & Company, LLC, Salem, OR

Table 1

Computer Games for the Agriculture Classroom

American Farmer™ (Bold Games – ©2004)

- Aesthetic appeal: Outstanding graphics and sound effects.
- Play style: Real-time.
- Financial Model: Provides basic current and historical financial statements.
- Business Model:
 - oEncourages players to think beyond commodity-driven agriculture – fosters innovation.
 - oEncourages players to think about employer-employee relations and recognizes that employees have different skill levels and abilities.
- Drawbacks: Only a partial farming year is played – winter is skipped.

The Farming Game® (Weekend Farmer Co. – ©1996)

- Aesthetic appeal: Okay graphics and sound effects.
- Play style: Turn-based (This is the computerized version of the old classic favorite board game.).
- Financial Model: Provides only basic financial information.
- Business Model:
 - oTeaches basic economic and business principles while keeping things simple.
 - oHas many 'random' events to simulate the real life of a farmer.
- Drawbacks:
 - oFarm labor costs assessed infrequently.
 - oThe game is somewhat unrealistic in terms of equipment and operating costs—they are too low, and do not vary with production levels.
 - oPlayers can get rich by buying and selling assets, which is not typical in farming.

Farm Game (KeyStone Interactive® – ©2004)

- Aesthetic appeal: Okay graphics and sound effects.
- Play style: Turn-based (It is nearly identical in playing features as The Farming Game above.).
- Financial Model: Provides very basic real-time balance sheet.
- Business Model:
 - oEncourages players to be timely in making decisions by only allowing them a certain amount of time each turn.
 - oHas many 'random' events to simulate the real life of a farmer.
- Drawbacks:
 - oFarm labor costs assessed infrequently.
 - oThe game is somewhat unrealistic in terms of operating costs—they do not vary with production levels.

Farm Land USA (ValuSoft®, K.O. Interactive – ©1999)

- Aesthetic appeal: Good graphics and sound effects. Catchy music, too.
- Play style: Turn-based.
- Financial Model: Provides no financial information except for the checking account balance and some information on loans.
- Business Model:
 - oIntroduces students to differing farming practices by climate zone.
 - oDemonstrates the power of leverage to the player in the form of employees and accomplishing farm work.
 - oExcellent online instruction manual on farming practices.
- Drawbacks:
 - oThe game sometimes has problems properly calculating the cash balance. It also sometimes forgets when loans stop amortizing.
 - oThe game doesn't incorporate the concept of operating costs beyond crop planting.
 - oThe game is unrealistic in its presentation of the keeping of livestock, which are 'planted' as if they are crops.

Sim Farm (Maxis – ©1993)

- Aesthetic appeal: Okay graphics and sound effects.
- Play style: Real-time.
- Financial Model: Provides basic financial statements.
- Business Model:
 - oIntroduces the player to the futures markets.
 - oHas many 'random' events to simulate the real life of a farmer.
 - oIntroduces the player to the concept of renting versus owning.
 - oForces the player to think socially in terms of responsible herbicide and pesticide usage.
- Drawbacks:
 - oThe game is somewhat unrealistic. The last time I checked, tractors cost much more than a few hundred dollars!
 - oNo cost is assessed for farm labor.

Stake Your Acres™ (Farm Works Software – ©1995)

- Aesthetic appeal: Okay graphics, no sound effects
- Play style: Turn based.
- Financial Model: Provides little financial information except the cash, loan, and equity balances.
- Business Model:
 - oThe most realistic economic model of any of the farm games I've played.
 - oIntroduces the player to the concept of renting versus owning, economies of scale, and insurance.
 - oForces the player to develop math skills in calculating how many pints/gallons of an herbicide he needs to cover his fields, or how many bags of seed corn he needs to buy to plant his acreage, etc.
 - oForces the player to develop math skills in calculating how many pints/gallons of an herbicide he needs to cover his fields, or how many bags of seed corn he needs to
 - oForces the player to a strict time management schedule that is balanced between the number of work hours in a day, the size of his equipment, and the weather.
- Drawbacks:
 - oLimited choices of crops/livestock.
 - oNo cost is assessed for labor.

Maximizing Accountability And Student Achievement

By Jasper S. Lee

Are you one of the Nation's teachers who is being held increasingly accountable for students' test scores and achievement of instructional standards? Most likely, you are. If so, your first question likely is "How do I do it?" Many teachers have found the best approach is to use a long-proven instructional material: the textbook. This is particularly the case with the much improved agricultural textbooks that are available today and the new approaches in using them.

Research reported in the March-April 2001 (Lee, Pp. 6-7) and the November-December 2001 (Lee, Pp. 12-13) issues of *The Agricultural Education Magazine* dealt with relationships of achievement test scores to how the students were taught. Various attributes in the instructional environments of agriculture teachers in the United States were studied. Those familiar with agricultural education are well aware of many of the strategies that are used. Astonishingly, using textbooks as an integral part of the instructional process resulted in much higher student standardized test scores than other techniques in teaching. Increasingly, the use of appropriate textbooks pays big dividends in student achievement!

This article will focus on two areas related to textbooks: selection and use. By following a few simple practices, you can increase student test scores and provide evidence of accountability in the agricultural education instructional program.

Selecting

Agriculture textbooks are much better today than just a few years ago. The research-based improvements have resulted in the authors and publishers working together to better meet the needs and interests of students and teachers. Most of today's textbooks are not, as one teacher said in a recent national study (Lee, 2005), "boring." With the exciting features in the textbooks available today, "boring" most

riculture classes:

■ **Curriculum fit**—The textbook selected for a particular class should cover the essential content and skills information included in the class. This relates to curriculum and standards for the class that may be provided locally or on a state-wide basis. In looking at "fit," remember that today's textbooks are outlined and developed using state standards and curriculum guides as the basis for content and sequence. Over-

Are you one of the Nation's teachers who is being held increasingly accountable for students' test scores and achievement of instructional standards?

likely results from improper selection and use.

"What should I consider when selecting a textbook?" is an important question. Funds for buying textbooks are limited. You want to choose and use those that best meet interests and needs.

Here are a few features to consider when selecting textbooks for ag-

all, there should be high correlation between the standards for a class and the content of the textbook that is selected.

■ **User friendliness**—The textbook selected for a class should be "friendly" to the students and teacher. This means that students and teacher are comfortable with the content, scope, and layout of the book. It is easy to use yet challenging in learning out-

comes.

■ **Student appeal**—A textbook should be appealing to students. Student appeal is influenced by colorful images and layout as well as the use of youthful models in the photographic illustrations. Research has shown the use of student models in illustrations is of high appeal among student users.

■ **Illustrations**—A textbook should be appropriately illustrated with photographs and line drawings. These must show approved and safe practices as well as provide for well-being of organisms and the environment. Student focus groups have repeatedly indicated that they like to see young people depicted in the images.

■ **Up-to-date content**—A textbook should be current in both content and illustrations. Out-of-date information may lead to inaccurate information in the teaching-learning process. The photographic images also convey a feeling of how up-to-date a textbook may be.

■ **Readability**—The reading level of a textbook should be appropriate for the grade level of the students in which it is to be used. Readability is influenced by length of words, sentences, and paragraphs as well as by layout and use of illustrations. Select a book that

has been checked for readability and one with which the author(s) considered reading ease in the writing process. Publishers and/or authors can usually provide information on readability. If not, select another textbook or you can assess readability yourself using a formula for determining reading ease. In addition to the words and sentences, remember that the organization of the content, use of illustrations, size of type, color highlighting, and other features influence reading ease.

■ **Supporting materials**—Select a textbook that has the desired supporting materials. These supporting materials may be used to enhance the teaching-learning process if the teacher chooses to use them. Examples of supporting materials include teacher’s manuals, activity manuals, and electronic lesson plan libraries.

In summary, choose an appealing and user-friendly textbook that best promotes achievement of your curriculum as well as holds students to appropriate standards of learning.

Using

Once the “right” textbook has been selected, using it properly in the instructional process is essential. Every student in a class should have a textbook to use in class as well as outside of class, as needed. Learning is not efficient when the teacher is the only individual with a textbook or there are not enough copies to go around.

Begin by helping students understand the powerful role of a textbook in their learning. Go over how the book is organized, chapter sequence and features such as career profiles and applications, and how you expect each student to use the textbook in the class. Indicate that mastery of textbook content will be followed with hands-on

activities. Such activities will likely mean more if students have the background information. Additionally, the hands-on or practice can be used to reinforce textbook content that relates to higher achievement tests scores by students and greater accountability for the teacher.

Higher achievement results when the chosen textbook is the center or focus of the instructional content. This can be done in an exciting way that involves hands-on application of content as well as experimentation. It also allows students to gain skills in being responsible for their own learning.

The process of integrating textbooks into mastery learning involves active participation by the teacher in directing instruction and leading activities. It can be best explained with a six-point model: RLRWP-E.

■ **R (reading)**—In this stage of the model, students read textbooks to gain motivation, information, and accepted practices. Features of the textbook are used to promote excitement for the learning process. These features include interest approaches, connections, profiles, and other short sections that may be a part of each chapter. Many of today’s textbooks are written sequentially and in short segments set apart by headings. These features help students achieve objectives and learn desired information. A teacher can use a range of strategies to promote student proficiency in reading. These include those used before reading, during reading, and after reading (Park, 2005).

■ **L (listening)**—Listening involves students hearing concepts and procedures discussed. Students gain skills in listening to acquire information. The teacher leads the discussion and involves students in providing information, which leads into the next “R” of

Focus on two areas related to textbooks: selection and use.

the model.

■ **R (responding)**—Responding involves students in actively answering, discussing, and otherwise verbalizing the content of a textbook. It promotes the development of skills in presenting information as well as listening to what has been said. Students develop abilities in orally communicating technical information. This, along with listening and writing, has been described as “engaging students in using the language of the field.” (Bottoms, 2005)

■ **W (writing)**—Writing involves students in recording salient terms, concepts, and other information. This helps them master spelling, definitions, relationships, and practices. Teachers and students may summarize content on a writing surface. Students may record the information in notes using paper and pencil, in a notebook, a laptop computer, or an appropriate activity manual.

■ **P (practice)**—Once the first four parts of the model have been covered, practice is provided through hands-on activities. Such activities should contribute to content mastery and relate specifically to the achievement of objectives. These may involve experiments in agriscience, demonstrations in horticulture, skill development in agricultural mechanics, and many other ways in the agricultural curriculum.

■ **E (evaluation)**—Evaluation is used to assess the performance of students in achieving the objectives. It may be done with paper and pencil tests, computer or web-based tests, projects, and other kinds of individual and group activities. Review of the work done should involve providing feedback and reinforcement to the learners.

The RLRWP-E model focuses on student mastery of the desired content

as specified in the objectives for the instruction. The steps are not sequential and can be used concurrently or in any sequence that best meets needs in a teaching-learning environment. The model has been described in professional literature for agricultural educators, such as *Teaching AgriScience* (2001), which is available from Pearson Prentice Hall Interstate. Some people may express concern about the opportunity to use problem solving approaches with this model. The use of problem solving as a technique in RLRWP-E is advocated though the focus will be on the mastery of content to assure high accountability on standardized tests.

Summary

No teaching-learning tool has greater potential in promoting student achievement of content than a textbook. Proper selection and use are essential. Authors and publishers carefully plan textbooks and supplementary materials to promote ease of use in demonstrating teacher and student accountability. No doubt, your students will achieve higher standardized test scores if the proper textbook is selected and used in a class as a teaching-learning tool.

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New Agriculture Curriculum Incorporates eBooks and Talking Text

By Margi Stone Cooper and
Randy Evans

As teachers are forced to compete with televisions, cell phones, Nintendos, and other electronic gizmos for a student's attention, Oklahoma agricultural educators may have a leg up, thanks to some innovative applications of technology to curriculum products.

Agricultural Education I, a newly revised edition of the best-selling curriculum produced by the Curriculum and Instructional Materials Center at the Oklahoma Department of Career and Technology Education, incorporates several new key features that can help make teaching—and learning—easier. For starters, the new book is deliberately more engaging. In contrast to the outline format of previous editions, the 2005 edition of *Agricultural Education I* more closely resembles a textbook. Each unit in the curriculum includes a feature story about a person in an unusual profession that ties in with the subject at hand. Hundreds of photos and neatly rendered illustrations have been added. In addition, dozens of short stories about interesting facts have been included to pique student interest.

The instructor's manual includes a CD with supplemental teaching resources, such as Cooperative Extension fact sheets, video clips, livestock breed photos, and tree and plant identification guides. Multiple-choice written tests have been provided on the CD in Microsoft Word format so that teachers can easily customize them for their own classroom use. A set of PowerPoint lecture slides, which

closely follow the book's content, is available as a separate companion product.

Going Paperless

In addition to its popular paper form, *Agricultural Education I* is available in eBook format and can be viewed using eReader—a software program that is easy to use and available at no cost. The eReader software allows books to be displayed on a laptop or desktop computer running on a PC, Macintosh, or Linux operating system. More importantly, eReader can be used on most PDAs (personal digital assistants, or handheld computers) and Symbian Smartphones.

Some may find that reading from a small electronic screen takes some getting used to but, with a little practice, it quickly becomes second nature. When viewing the eBook version of *Agricultural Education I*, students can adjust the size of the font, perform word searches, add electronic bookmarks and personal notes, view photos and illustrations, and “navigate” through the document by clicking on built-in hypertext links. To turn pages, students simply tap on the screen. Traditional pencil/paper workbook activities have been created in Excel, which allows for lockable and editable fields so that students don't accidentally write their answers over the questions. The backlight feature built into most PDAs also allows students to read in situations where they normally couldn't read a printed textbook.

Though not yet formally released to the public, the *Agricultural Education I* eBook curriculum is already having an impact while being piloted in a handful of classrooms across Okla-

homa. The response of Broken Arrow High School agriculture students to the eBook curriculum has been overwhelmingly positive. In fact, many students have said they wish more curriculum products were available in eBook format. The interactivity of the eBook seems to be the most rewarding and educational enhancing aspect of the new design. Students like being able to write notes in their eBooks. They also like tapping on links and being taken to pictures and sidebar stories, rather than being forced to look through them while scrolling.

The Key to Success

Successful early childhood education includes activities that are challenging as well as entertaining. These factors are the reasons for the popularity of such educational television programs as *Sesame Street* and *Mr. Rogers*. Much of the learning in elementary school is also fun and engaging. However, the nature of structured learning often loses some of its luster at the high school level. As a result, some students become easily distracted. Most students today own cell phones, pagers, MP3 players, and gaming systems. Since multi-use handheld computers support these and other functions, the PDA curriculum seamlessly blends education with the students' world of technology. This allows teachers to take advantage of the fact that students are more likely to be drawn to meaningful learning activities that are new and entertaining.

In addition to providing access to electronic curriculum, PDAs allow agricultural education students a one-on-one opportunity to use a computer. In a traditional computer lab, students must share a computer with students

in another class within the confines of one classroom. From a logistical standpoint, this makes it difficult to provide meaningful learning. The use of PDAs in the agricultural classroom allows students to use the technology at the site of instruction, wherever and whenever it is needed—and at a much lower cost than a desktop computer. While students commonly use these devices as an organizer or electronic notepad, they can also be used to track the progress of show livestock, photograph species of range plants in their natural settings, calculate the correct amount of fertilizer to use, take and record environmental readings, and access the Internet. Though students can become quite proficient at taking notes by writing on the small PDA screen or tapping on letters using a stylus, students can also attach a collapsible keyboard, which enables them to more efficiently write research papers and complete other written assignments.

The eBook format offers an added bonus, considering the comprehensive nature of *Agricultural Education I*. With the student workbook numbering more than 800 pages and the instructor's manual approaching 2000 pages, the eBook format encourages students to think of the curriculum as a more portable learning resource than might have previously been the case. Perhaps the greatest unforeseen benefit was that a Broken Arrow High School student with serious back trouble was afforded the ability to carry several books in a device the size of a deck of cards instead of lugging a huge backpack weighing up to 35 pounds!

Project Challenges

New technologies often bring with them new challenges. Recent models of handheld devices have built-in features that make it difficult for teachers to detect instant messaging (electronic note passing), web surfing,

or even cheating. Although sophisticated anti-cheating devices are available that disable the infrared beaming function on PDAs, Oklahoma's pilot study uses a more low-tech—and less expensive—approach to test taking. Written tests are distributed as eBooks, and the students use a pencil to fill in paper answer sheets. The tests are in multiple-choice format, and questions can be reorganized to discourage students from electronically sharing (or “beaming”) their answers with others.

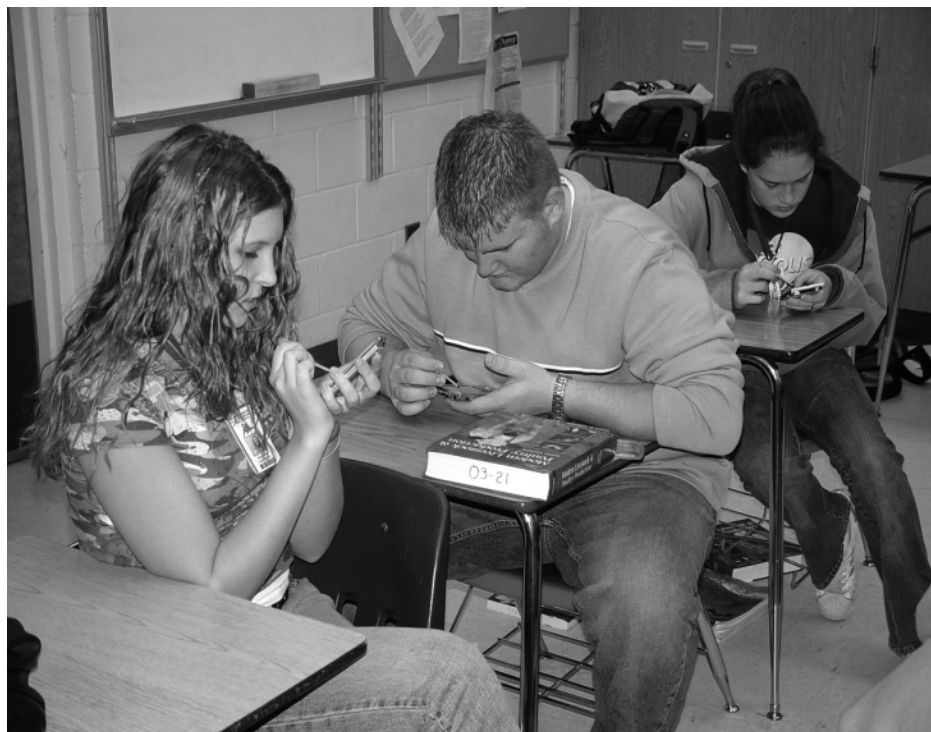
Another challenge has been the inability for students to complete assignment sheets using eReader. Since an eBook is an uneditable file, students must exit eReader and load a different program such as Forms To Go to complete assignment sheets on their PDAs. This step became necessary due to copyright issues, the costs involved with curriculum development, and the limitations of the software used to create eBooks. However, future versions of the software programs may allow for more flexibility.

Clearly, a disadvantage of using PDAs in the classroom is that they can be easily lost, stolen, or broken. Oklahoma students who use the PDAs say they appreciate the confidence shown by their instructors in their ability to use, care for, and maintain the equipment. So far, the PDAs have fared well with only minor mishaps occurring, many of which could be attributed to normal use and wear. Of course, printed materials can also be lost or damaged. If an eBook file is lost, however, it can simply be reinstalled.

Look Who's Talking

The additional text in *Agricultural Education I* means more reading for students, presenting an additional challenge to those with reading disabilities. To address this, CIMC is experimenting with a “Read Out Loud” version of *Agricultural Education I*. This version consists of a secured PDF file that takes advantage of the built-in text-to-speech feature in Adobe Acrobat 6 and later releases. Ideally, stu-

Students using their PDA's to do a class assignment.



dents could listen to the audio file on a desktop computer while following along with the reading in their textbooks or PDAs. Many schools routinely hire teachers' aides who, in addition to their other responsibilities, are assigned to read out loud to students who face reading challenges. Adobe Acrobat's text-to-speech feature can essentially liberate classroom assistants from their reading duties, allowing them to focus on assisting teachers and students in other ways.

So far, interest in the Read Out Loud version of *Agricultural Education I* has been quite favorable, with

A software program that is easy to use and available at no cost!

89 percent of agricultural education teachers recently surveyed saying that they believe such a product would be helpful for students whose reading ability is below average (Oklahoma Survey). Ninety-two percent of teachers said that Read Out Loud tests would be helpful for students who have difficulty completing traditional written tests. In addition, 74 percent of the teachers reported that students who

don't have reading problems could probably still benefit from using the text-to-speech feature.¹

"Real Learning" for the "Real World"

While the "coolness factor" is great for capturing student interest, incorporating technology into curriculum is becoming increasingly important for preparing students for the workplace. Business and industry is inundated with technology, and the use of a PDA is becoming mainstream, rather than an option just for "techies." Currently, doctors use PDAs for viewing their reference materials, cow-calf producers for maintaining records, landscape designers for making on-the-go project adjustments, personal business owners for tracking invoices, and agriculture teachers for keeping one step ahead of their students! More and more, employers expect new employees to know how to use technology from their very first day on the job, making early exposure to those technologies a necessity. Students who have developed skills using technology have a definite advantage over others when entering the workforce.

Broken Arrow High School agriculture students have also shown improvement in such areas as time management, promptness, quality of work, and organization—an added benefit of using the organizer and calendar functions built into the PDAs. All of these are soft skills highly sought after by business and industry and are directly tied to the basic philosophies of successful students and citizens. These skills can be difficult to teach, but they are greatly enhanced by the use of the technology.

Teachers participating in the eBook pilot studies in Oklahoma agree that incorporating technology into the curriculum is the next logical step in

education and workplace preparedness. The eBook curriculum project has proven to be both an exciting new venue for agriculture students and an ideal professional development activity that has helped teachers become more effective and efficient.

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Environmental Programs and Resources for Agricultural Education

By Erica M. Schneider

Agriculture teachers have an impact in shaping student attitudes and what they do after they graduate. They, directly and indirectly, educate students on life knowledge and skills they need to be successful. They teach students responsibility, citizenship, and interdependence. Responsibility to help students to understand the impact of their actions and their roles within society. Citizenship to inform students on their relationships with others and how they as individuals can contribute to a better society. Interdependence to give students the skills to solve problems, make decisions, and plans. Likewise, adding environmental education to agriculture curricula would also help to develop these skills.

Collectively, agriculture teachers are major contributors in shaping the nations' attitudes toward the environment and overall environmental literacy. Agriculture classrooms are far too often the only source where students are exposed to environmental related topics. North American Association for Environmental Education defines environmental education as:

“[A] learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and taking responsible action.”

By helping citizens become more environmentally literate, agriculture teachers would make citizens feel more

accountable for their impacts on others and the Earth. “Environmental education gives people a deeper understanding of the environment, inspiring them to take personal responsibility for its preservation and restoration,” (<http://www.epa.gov/enviroed/index.html>, 2005). Environmental problems are solved when citizens feel more accountable and responsible for their actions. Environmental education a necessary part of youth development, to develop responsible citizens who understand their interdependence with the environment.

Peter Kropotkin put it best when he said, “*What kind of world do you want to live in? Demand that your teachers teach you what you need to build it.*” Agriculture teachers are students' guides to a more sustainable future. Environmental literacy implies, “[A]n understanding of how people and societies relate to one another and to natural systems, and how they might do so sustainably. It presumes both awareness of the interrelatedness of life and the knowledge of how the world works as a physical system,” (Orr, 1990). With environmental literacy the U.S. can begin to create a more sustainable and environmentally friendly nation and global community.

Of course, this type of learning cannot be achieved in one classroom unit or on a single field trip, nor can it be readily accomplished in science classes alone. “Building environmental literacy requires an on-going effort that explicitly addresses knowledge and skills in the sciences, social sciences, and humanities, and allows repeated opportunities to apply those skills.” (EETAP, 2005).

Teacher Programs

The most important step in infusing environmental education in students' curricula is for agriculture teachers to have adequate environmental knowledge. An educator must be, to a certain degree, sure they know what they are talking about before they relay information to their students.

Buethel and Smallwood (1987) examined the environmental literacy of teachers and students and less than half the teachers knew the meanings of widely used terms such as biosphere, particulates, and ozone. They found that students' levels of environmental literacy were positively correlated to the teacher's level of environmental literacy. Clearly, teachers must be environmentally literate if they are to help their students become environmentally literate.

The good news for teachers is that there are many available resources to teach environmental education. Many teachers shyly admitted to not including environmental education in their curricula simply because they felt deficient in the subject. However, this deficiency should not hinder the knowledge of students when there are so many programs designed specifically to help teachers teach environmental education.

Programs such as Project WILD, Program WET (Water Education for Teachers), EETAP (Environmental Education and Training Partnerships), Project Learning Tree, and many more have been helping educators teach environmental education for years (Table 1). The programs offer online courses for environmental education training,

provide free downloads of lesson/program plans and activities, along with helpful hints to infuse environmental education in daily lessons.

Student Programs

The second major step for teachers to create environmental literacy in their students is by having them actively participate in environmental education events. PEYA (President's Environmental Youth Awards) has been

presented annually since 1971 to honor students in kindergarten through twelfth grade who develop projects that help protect local environments and promote local environmental awareness in their communities. Last year's 2004 winners visited the White House and met the President of the United States.

Other environmental education events include Envirothon, an international environmental education program for secondary school students, that

agriculture teachers all over are already taking part in, getting students involved during National Environmental Education Week, Earth Day (April 22), Earth Month (May), and World Environment Day (June 5, 2005). The EPA also has Environmental Kid clubs for young and older students. Being active in environmental events makes learning about the environment fun, allows students to get hands-on experience, have social interactions, and be involved in group learning (Table 2).

Table 1 Teacher Programs

1. Project WILD

- Project WILD is one of the most widely-used conservation and environmental education programs among educators of students in kindergarten through high school. Conduct 6 hour long training workshops to help educators gain confidence in teaching environmental education.
- <http://www.projectwild.org/>

2. Program WET (Water Education for Teachers)

- A non profit water education program and publisher for educators and young people ages 5 - 18. The program facilitates and promotes awareness, appreciation, knowledge, and stewardship of water resources through the dissemination of classroom-ready teaching aids and the establishment of internationally sponsored Project WET programs.
- <http://www.projectwet.org/>

3. EETAP (Environmental Education and Training Partnerships)

- Where you can take online courses helping you to gain a foundational knowledge of environmental education and learn how you can incorporate quality environmental education into your instruction. Workshops are also available for environmental education training.
- www.eetap.org

4. Project Learning Tree

- Project Learning Tree (PLT) is a partner in the Environmental Education Training Partnerships (EETAP), the national training program of the U.S. Environmental Protection Agency's (EPA) Office of Environmental Education. PLT provides useful workshops to train educators in environmental education. Search the calendar of events to find a workshop close to you.
- <http://www.plt.org>

5. NAAE

- Provide support for environmental education and educators, NAAE offers a variety of programs and activities. These include NAAE's Annual Conference, NAAE publications, and EE-Link.
- www.naaee.org

6. EPA

- Provides information on workshops and conferences for educators.
- <http://www.epa.gov/epahome/educational.htm>

Table 2

Student Programs

1. PEYA

- This program recognizes young people across America for projects which demonstrate their commitment to the environment. Young people in all 50 states and the U. S. territories are invited to participate in the program.
- <http://www.epa.gov/enviroed/awards.html>

2. Envirothon

- The Envirothon idea is simple - combine the proven concepts of hands-on education with the excitement of a good competition and the fun of spending a day in the outdoors. The result is an effective educational tool which will help our state's schools to nurture environmentally aware students and meet the immediate need to teach more environmental education. They are run state to state.
- <http://www.aiswcd.org/Envirothon.asp>

3. EPA

- The EPA also provides links and lists of service projects and environmental events for youth.
- <http://www.epa.gov/teachers/community-svc-projects.htm>

Curriculum Resources

An important step that teachers can take in infusing environmental education in their curricula is knowing where and how to infuse it (Table 3). Most people assume that environmental education is considered as science education. However, as Van Matre (1990) points out, "The primary aim of science education is the process of 'sciencing,' i.e., gaining the skills necessary to apply the scientific method. And its purview does not usually include the task of helping learners analyze and craft more appropriate lifestyles." Yes, though environmental education brings up many concepts, science courses should not be the only place students are exposed to environmental education.

Like agricultural education, environmental education by nature is interdisciplinary. "It places emphasis on the learning process, problem solving skills, and the use of community as a learning resource," (Smith, 1994). Further, environmental education has roots in multiple subjects including social studies, language arts, mathematics, and of course, science. It overlaps several fields because its complexity demands well-rounded subject matter (Smith, 1994).

Consider, for example the topic of carrying capacity and population overgrowth:

"A mathematics teacher could integrate the numerical dynamics of these issues into a unit. A social studies teacher could use them to examine

their social aspects and implications. A science teacher could examine their effects on human and animal populations. A language arts teacher could suggest using different aspects of these issues as topics for a planned speech, thereby infusing environmental education into a unit on public speaking skills," (Smith, 1994).

By understanding the complexity surrounding environmental education and acknowledging that it should be infused in a variety of subject matter, educators can help students instill positive attitudes about the environment and develop a sense that they need to alter their lifestyles in order to live in an "environmentally responsible manner," (Smith, 1994).

Getting agriculture teachers to include environmental education in their

curricula is a natural fit because the subject matter is so closely related. Agricultural education is the great place to start developing environmental literacy because environmental topics already exist within agriculture curricula. Through increasing agriculture teachers' overall environmental literacy, student involvement in environmental events and activities, and awareness of resources available to agricultural educators can help contribute to creating a more sustainable future.

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Table 3 Curriculum Resources

1. Project Learning Tree

- Provides lesson plan material and activity guides for infusing environmental education in curricula.
- <http://www.plt.org>

2. NAAEE

- Provides resource links for educators as well as workbook downloads and catalogs of lesson plans on a variety of subjects.
- www.naaee.org/resources
- <http://eelink.net/lessonplans.html> (a partner from NAAEE) offers free downloads of environmental education for educators.

3. EPA

- Provides information on grants, curriculum guides, free materials for students, service projects, lesson plans, etc.
- <http://www.epa.gov.epahome/educational.htm>

4. Project WILD

- Provides materials and resources for educators wishing to teach about the environment, including videos, lesson plans, and activities.
- <http://www.projectwild.org/>

Reap the Benefits of Games and Simulations in the Classroom

By Neil A. Knobloch

Agricultural educators teach students business management and entrepreneurship through classroom instruction, supervised agricultural experiences, and career development events. Entrepreneurship and financial decision-making has been a part of the agricultural education curriculum and purpose since its inception. The need for teaching entrepreneurship and business management is as critical today as it was a century ago. Small businesses are the economic life-line for many American communities and for those who are in agriculture as well. The need is clear—America needs entrepreneurs, and agricultural educators have an excellent educational model to prepare them.

Agricultural educators need instructional resources to motivate and engage students to learn business management concepts and skills that will translate into entrepreneurship. Learner-centered teaching engages students to be active participants in the classroom while the teacher facilitates the learning process. Educational games and simulations are instructional resources teachers can use to make their teaching more learner-centered. The purpose of this article is to briefly discuss the advantages and considerations of using games and simulations in the classroom and to highlight a simulation that agricultural educators can use to teach business management and entrepreneurship to their students.

Educational Games & Simulations

Games and simulations are not new in education. They were used to

teach military personnel strategic planning since the 1600s, and became a common method of teaching in business and medical education in the late 1950s (Gredler, 2004). Although business simulations have been commonly used to enrich learning environments in management education (Keys & Wolfe, 1990), games and simulations are a neglected educational resource (Sniedovich, 2002). *Games* are competitive exercises that players must apply relevant knowledge to advance through the exercise and try to win. *Simulations* are evolving case studies of a social or physical reality and participants play real-like roles with well-defined responsibilities and constraints (Gredler, 2004).

Games and simulations have a number of educational benefits. Academic games may help achieve four purposes: (a) practice already-acquired knowledge and skills; (b) identify gaps or weaknesses in knowledge or skills; (b) serve as a summary activity or review; and, (d) develop new relationships among concepts or principles (Gredler, 2004). Simulations bridge the gap between the classroom and the real-world with complex, evolving problems. Simulations can uncover student misconceptions and understandings of the content and they can also provide feedback on students' problem-solving strategies (Gredler, 2004). Further, students were more interested in learning and had greater retention when games and simulations were used compared to conventional classroom instruction (Randel, Morris, Wetzel, & Whitehill, 1992).

Although games and simulations create interest and provide students with hands-on learning opportunities to apply knowledge and concepts, teach-

Games and simulations create interest and provide students with hands-on learning opportunities.

ers have a few considerations when selecting games and simulations. Although there may be an abundance of educational resources, there is a "lack of well-designed games for the classroom setting" (Gredler, 2004, p. 573). Teachers should select educational games for their classroom based on Gredler's essential design criteria: (a) winning should be based on knowledge and skills and not random factors; (b) games should address important content and not trivia; (c) the dynamics of the game should be easy to understand and interesting to players, but not obstruct or distort learning; (d) students should not lose points for wrong answers, but be encouraged to learn from making mistakes; and (e) games should not be zero-sum exercises in which only one player wins at the expense of others (p. 572).

Teachers should select well-designed games or simulations that would help achieve desired educational outcomes (Gredler, 2004), not just because they would be a fun activity for students. Teachers should also provide instruction regarding the relevant knowledge and skills before engaging students in a game or simulation. Teachers should model the skills and decisions for students before engaging them in the educational exercise. After students understand the procedures and general knowledge and skills they will need to apply, teachers will need to serve as a facilitator by providing appropriate structure, feedback and guiding comments for students to be successful in the educational exercise.

Reap the Benefits of a Business Management Simulation

Teaching students about agricultural business management can be challenging. When asked how students respond to teaching agribusiness management, agriculture teachers consistently replied, “they get bored.” Passive learning leads to unmotivated learners in most high school classrooms. Teachers search for resources that will promote hands-on learning and motivate students to learn. Some topics lend themselves for active learning and other topics are more challenging to teach. As a beginning agriculture teacher, I discovered a way to teach high school students about accounting, business management, and entrepreneurship using a board game I played as a teenager growing up on the family farm. With the help of my friendly accountant (my spouse, June), we adapted the classic, award-winning *Farming Game* to motivate and engage my high school students to learn a too-often boring topic.

After getting my doctorate degree and conducting research on

learner-centered teaching, I developed *Reap: A Business Management Simulation* for high school and college teachers. Based on John Dewey’s philosophy of experiential learning, I developed Reap for teachers to provide their students with real-life business experiences. Using The Farming Game, each student assumes the role as a farm manager and starts the game with 10 acres of hay, 10 acres of grain, and \$5,000 cash from an operating note. The Farming Game is set up on a calendar (fiscal) year. There are harvest seasons for hay, grain, fruit, and cattle. Each time a player lands on a harvest season for an asset they own, s/he rolls the dice to determine the level of yield or income. An expense card is also

next level of learning by providing students with real-life experiences as business managers, therefore, making it an educational simulation. The Farming Game is slightly modified for the Reap version. The paper money, bank notes, and vinyl stamps are removed. Option To Buy cardholders are added for players to keep their cards organized for continuous play between class periods. Students track all their expenses using a transaction register worksheet just as business entrepreneurs do and learn how to analyze their financial performance to make better decisions and returns on investments. At the end of each year or each time around the board, students complete financial statements to determine their profit or loss, owner’s equity, assets, and liabilities. Students learn the business management cycle—strategic planning, decision-making, accounting, and financial analysis—by repeating the process each time play a fiscal year. Reap is a complete package of instructional resources for teachers to teach introductory business management to high school and community college students.

Reap is a user-friendly teaching tool. All the teaching tools are on a CD so teachers can adapt the files to fit their students’ needs. The CD comes with the 130-page facilitator’s guide of all 15 financial transactions and all the business management concepts that can be taught while playing Reap. The Facilitator Guide pages and worksheets are in a printer-friendly PDF format. In addition, there are customizable PowerPoint® Presentations, Excel® Spreadsheet, Study Guides and Tests with answer keys. The CD also has teaching tips and student handouts. Reap can be used as an instructional unit for 3 weeks in a high school classroom, an introductory activity or summary activity in a college classroom, or integrated throughout an educational program or business classroom to teach specific business

Games and simulations are a neglected educational resource!

drawn at the time of each harvest. Players can borrow up to \$50,000 to purchase assets in which they have an Option To Buy card. Players continue to play the game, purchase assets, make profits, and build their net worth. The goal is for players to reach \$250,000 in net worth.

Reap takes a board game to the

concepts. More information about Reap can be found at: www.ahhtomoney.com.

Teacher Reviews

Reap has been field-tested and reviewed by over 30 teachers and business experts during the 2004-05 school year. The results are consistent—Reap is a powerful tool to motivate and engage students to learn business management, accounting, and entrepreneurship. Here are a few reviews from agricultural educators who have used Reap in their classrooms.

Jeff Maierhofer, Agriculture Teacher at Seneca High School in Illinois, used Reap with his junior-level agricultural business class. Jeff shared, “My students really liked it! Reap is an outstanding method to teach double-entry accounting. It is very thorough, yet down to earth way to teach...the hands-on approach made it seem real.”

Tony Stoller, Agriculture Teacher at Smithville High School in Ohio, used Reap with his agricultural business students after he started a milk vending business. His students quickly learned the accounting system and were able to organize a way to keep track of the income and expenses for their milk vending business. He shared that Reap was “very ‘real-life’ in an entertaining, competitive format. This is a great way to create a felt need in learning business management and decision-making.” Tony also taught his freshmen how to complete the SAE record book using Reap version Farming Game. He found that Reap helped his students develop a better understanding of how money flows through a business and his students SAE records were more accurate after they played Reap.

Kellie Warner, Agriculture Teacher at Edgewood High School in Ohio, taught her juniors agribusiness

management using Reap. Kellie noted that Reap helped her students learn valuable information about agricultural business, promoted friendly competition, and helped her facilitate learning. She shared, “Students were excited, engaged, and interested from beginning to end. They interacted well, helping each other through the game while remaining competitive. Reap teaches extremely valuable information that even the students recognized as beneficial from the very beginning. The game involves the use of math, problem-solving, critical analysis and planning—all skills that students typically don’t consider to be vital in running an agricultural business. After finishing this unit, many students commented on how their perceptions of agricultural businesses had changed.” Kellie added, “The Facilitator’s Guide provided excellent examples of financial transactions, making it easy for the instructor to teach using examples and situations that students may encounter during the game.”

Reap is a successful business management simulation because it has the characteristics of being a well-designed simulation (Gredler, 2004): (a) Students interact with an adequate model of the complex real-situation; (b) students have defined roles with responsibilities and constraints; (c) students execute a range of decision-making strategies in a data-rich environment; and, (d) students receive feedback in the form of changes in the problem or situation. Games and simulations can get students excited and engaged in learning about business management and entrepreneurship. Well-designed instructional resources can be the catalyst for student-centered learning, but a motivated teacher is the most important instructional resource in the classroom.

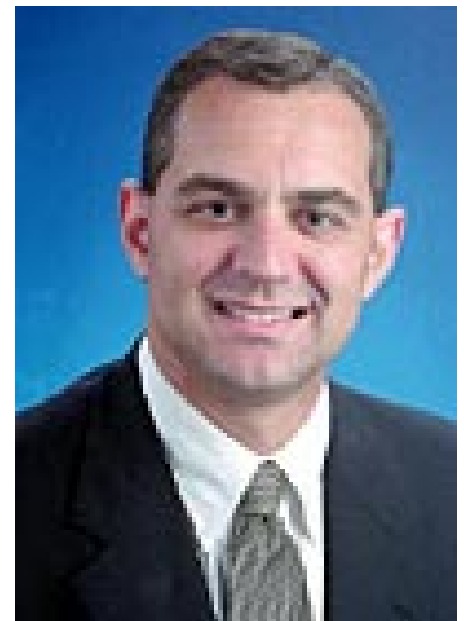
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Actively Teaching: Strategies for Use in the Agriculture Classroom

By Paula Faulker and
Connie D. Baggett

How often have you asked the question, “How can I keep my students involved during lessons?” or “What can I possibly do to promote student interest and motivation?” The answer to either question is not as complicated as you may assume. The use of active learning strategies (see Table 1) has proven to be successful for involving students in the learning process.

Active learning refers to techniques where students do more than simply listen to a lecture (McKinney, 2005). Active learning allows the student to move from the role of note taker to a participant in the learning process (Deeter, 2003). According to Mankin et al. (2001), “Students in agriculture, Kansas State University, were asked to identify specific teaching styles, classroom environments, grading methods, and assignment types that motivated them to learn.” Mankin et al. found “the most motivating characteristics in each category were an enthusiastic and interesting teaching style, an interactive classroom environment, fair grading methods, and assignment types that provided experience relevant to the profession. The most-cited factor reducing motivation was a long, boring lecture.” However, Mankin et al. is not discounting lectures but stressing the importance of involving students in the learning process.

Agriculture science teachers, like other teachers, can use these active learning strategies for motivational benefits. Today’s agriculture is biotech-

nology, international marketing, genetics, engineering, food science, computers, horticulture, communications, veterinary science and much more (Gagnon & Keith, 1988). To prepare students for the “real world”, innovative teaching strategies must be used. Agricultural science teachers will find they can increase student learning and participation if an active learning environment is provided. The essence of learning styles is that each of us receives and processes information differently, and because this is so, teachers should make every attempt to learn how students learn best (Ellis & Fouts, 1993).

There are numerous active learning strategies that can be successful in the agriculture classroom. For example, games and role-playing are popular active teaching strategies. They stimulate student interest and motivation, which increases student learning. DeBord (1987) stated, “These approaches have high group member involvement while facilitating meaningful and fun learning.”

Sara Beth Wanbaugh, agricultural science teacher at Big Springs High School, Pennsylvania agrees. Ms. Wanbaugh says, “Games such as tic-tac-toe, word searches, and football are always classroom favorites.” In her classroom, one student is designated as the referee and another student as football controller at the chalkboard. Students are asked questions by the teacher about the food chain, such as naming a predator or a consumer. Teams take turns answering questions. When a correct answer is given, the football is moved toward the end zone. If an incorrect answer is given, the other team gets the football. Ms.

Wanbaugh stated, “Games are a great way for reviewing for tests or quizzes.”

Several active teaching strategies for the agriculture classroom are provided below.

Active teaching strategy: Cooperative pairs and Role-play Topic: Small gas engines

For this strategy, Ms. Wanbaugh teaches her students about small gas engines. A job site is the hypothetical setting. First, students are paired with a peer. Next, each pair receives a small gas engine with a missing part(s). The cooperative pairs are instructed to work together to decide what the problem is and what they need to do to make the necessary repair(s). Ms. Wanbaugh’s role is that of the customer. When the students make the repair(s), they must explain to Ms. Wanbaugh what was wrong and how they made the repair. Ms. Wanbaugh stated, “This activity provides the opportunity for my students to prepare for “real world” situations when they enter the workplace.”

As it relates to cooperative learning, Ellis and Fouts (1997) stated, “Cooperative learning is one of the biggest, if not the biggest, educational innovations of our time.” Ellis and Fouts continued by stating, “Cooperative learning takes on many different forms in classrooms, but they all involve students working in groups or teams to achieve certain educational goals.” McKeachie (2002) agrees that cooperative learning methods increase student participation, interaction, and improves social skills training.

Active teaching strategy: Response cards. Topic: Agribusiness

Response cards provide short responses and they are best with a limited number of possible responses. They provide a way of increasing responses and give every student the opportunity to respond. Answers for

cards can be preprinted or written by students. The teacher provides students with background information on basic terms used for keeping records. Next, the teacher provides students with pre-printed short answer response cards that include income versus expense, assets versus liabilities, net income versus labor income, net income

versus net worth, and partial budgets. Questions are posed and students are expected to hold up the card that reflects their answer. The teacher is able to see individual answers and corrects incorrect answers immediately. After the successful completion of this lesson, students should gain an increased understanding of how accounting

Table 1
Active Learning Strategies

Strategy	Description
Role Play	Provides the opportunity for the student to act out a real-life situation in front of an audience
Choral Response	Involves a short or same wording (i.e. “yes/no”) for responses. Responses are conducted simultaneously. Prompts (i.e. finger snap or a tap on an object) are provided to promote responses.
Games	Promote rich discussions as students work hard to prove their point. However, games can also promote competition, so students need to be reminded of rules prior to the game.
Response Card	Use with limited number of possible responses. Responses can be handwritten or pre-printed on index cards. When questions are posed, cards are held up displaying the response(s).
Think / Pair / Share	Give a question, problem, or example to solve. Give 2 - 5 minutes of think time. Next, allow time to discuss ideas for 3 - 5 minutes with a peer, and then ask or choose student pairs to share their ideas with the entire class.

records are used to make management decisions in agribusiness operations.

Conclusion

Active learning strategies provide highly effective opportunities for students to become involved in the classroom environment. When student interest and motivation are peaked, learning is inevitable. In smaller classrooms, not all active strategies can be successfully implemented. Teachers should plan lessons according to the number of students, materials needed, and allocated time. In larger classes, classroom management, especially off-task behaviors, can pose concerns. Teach-

ers should plan for increased lesson planning, evaluation, and student learning and participation.

When agriculture teachers use active teaching strategies, every student is guaranteed the opportunity to increase their interest and motivation to learn.

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“Games are a great way for reviewing for tests or quizzes.”
S. B. Wanbaugh

The Agricultural Education Magazine - 2006 Themes

The focus of The Magazine is to be a “hands-on,” practical approach journal. Articles should share specific steps one can take to make teaching and learning in and about agriculture more efficient, enjoyable, and effective. The best articles for The Magazine are ones that have a clear point and share practices that can be used in the “real world” of teaching agriculture.

January – February 2006

Motivating Students to Learn

How do you as a teacher make the classroom come alive? This issue of The Magazine will focus on helping teachers motivate learners. Questions such: How do I get students excited about learning?, How does one motivate students using brain based learning models? and, How do teachers keep up their energy in an effort to keep the classroom motivation going?, will be answered.

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Due to Theme Editor: November 15, 2005
Due to Editor: December 1, 2005

March – April 2006

Developing Students for Careers

What careers should agricultural education be focused upon? How does a teacher of agriculture, at any level, prepare students for the selected careers? What steps are incurred in developing students for their chosen careers? How does the teacher involve the community and connect to the

community in the preparation of students for various agricultural careers?

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Due to Theme Editor: January 15, 2006
Due to Editor: February 1, 2006

May – June 2006

Thinking Critically

What does it mean to think critically? What does it mean to involve students in thinking critically? How does the teacher know when optimum critical thinking has occurred? What are some strategies to use to engage students in critical thinking?

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Due to Theme Editor: March 15, 2006
Due to Editor: April 1, 2006

July - August 2006

Enhancing Diversity

This issue will look at the issue of diversity in a global perspective. Why does agricultural education need to diversify its programs? Is the concept of urbanizing agricultural education programs now at the forefront of the profession? What different ways of knowing related to culture, gender, and place of living? How does one build a sense of belonging in students?

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Due to Theme Editor: May 15, 2006
Due to Editor: June 1, 2006

September - October 2006

Developing Professionals

What does it mean to be a professional? Why should one belong to professional organizations? How does one mentor student teacher and first year teachers? What is the responsibility of first year teachers related to their professional development?

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Due to Theme Editor: July 15, 2006
Due to Editor: August 1, 2006

November – December 2006

Reflections and the Future

This will be a unique issue. The authors for this issue will be by invitation only. The authors will come from amongst the retired agricultural educators across America. The essence is for the retired agricultural educators to reflect on the past, and provide some wisdom for what the current profession should be doing. How should lessons from the past drive our profession today? What ought to be the foundation of agricultural education? What would I do different today if I could do it all over again?

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2006 Themes

