Journal of Agricultural Education
Volume 50, Number 4, pp. 14 - 24
DOI: 10.5032/jae.2009.04014

EXAMINING DIFFERENCES IN MIDDLE SCHOOL STUDENT ACHIEVEMENT ON A CRITERION-REFERENCED COMPETENCY TEST (CRCT) IN SCIENCE

Jamie Rich, Middle School Agriscience Teacher
Dennis W. Duncan, Associate Professor
Maria Navarro, Assistant Professor
John C. Ricketts, Associate Professor
The University of Georgia

Abstract

Many authors have posited that agricultural education curriculum in middle schools may enhance student performance in science. To determine the effect that agricultural education curriculum has upon Georgia middle schools' student performance in science, this descriptive study compared science knowledge among middle school students in Georgia who were enrolled in schools with and without agricultural education programs. To quantify the science knowledge and skills of students, the researchers used the state's annual Criterion-Referenced Competency Test (CRCT) (science), mandatory for all students in middle schools. The scores of students in the 51 middle schools in the state with agricultural education programs were compared to the scores of students in 51 similar schools that did not have an agricultural education program. The percentage of students meeting or exceeding the standards in the CRCT test were consistently higher (and sometimes significantly higher) in schools with agricultural education programs over two consecutive school years. Although the researchers cannot conclude that the difference is due solely to the agricultural education programs, the results of this study open a myriad of opportunities for further research.

Introduction/Conceptual Framework

Middle school agricultural education, though not as developed and frequent as its high school counterpart, is gaining ground. Frick (1993) conducted an important study for the discipline that provided a national framework for middle school agricultural education curriculum. Recommendations included age appropriate curriculum, providing for a distinction between offerings from middle school and high school students, and integrating middle school agricultural education into the total school curricula whenever possible. Frick also reported that a taskforce on middle school agricultural education suggested agricultural literacy and agricultural topic exploration as two thematic goals of said programs. The National Research Council (1988) report *Understanding Agriculture: New Directions for Education* had also previously cited the need for agricultural literacy as a focus area.

According to Rossetti and McCaslin (1994), by 1991 14 states had officially created a core curriculum for middle school agricultural education, and 18 states had middle school agricultural education but did "not have a core curriculum" (Rossetti & McCaslin, p. 24). The number of states and the numbers of middle schools in the United States with agricultural education programs are continually increasing. According to a report by Fritz and Moody (1997), "over half of the respondents that did not have junior high/middle school programs wanted to add the program, but the 'school class schedule' was the most frequently identified deterrent" (p. 61). To this day, there continues to be a need for agricultural education at the middle school level in the United States. Gibbs (2005), pointed out the following:

> Traditionally, students have been strongly encouraged at the high school level to consider careers and choose

> courses that would fortify occupations of interest. Today, administrators and educators across the nation realize that developing students' interest must be addressed earlier—at the middle school level. Agriculture educators believe this to be true and are working to grow middle school agriculture education. (p. 1).

Agricultural literacy is vital to people preparing for occupations in agriculture and for all end users of agricultural products (Committee for Middle School Improvement Programs, 2005). At the time this study was conducted, Georgia had 51 middle schools with programs in grades six through eight that explored agriculture and related careers using the total program model: (1) classroom and laboratory, (2) supervised egricultural experience (SAE) programs, and (3) National FFA Organization membership. The middle school agricultural education program is a successful means to connect the classroom and the laboratory with the real world, encourage students to learn, and cultivate the perception that long-term success starts in middle school (Gibbs, 2005).

In addition to agricultural literacy and career exploration, it seems as though middle school agricultural education may also be providing an additional benefit. According to the National FFA's Middle School Discovery Web site, which was sponsored by the United States Department of Agriculture, one of the goals of the site is to "teach youth about agricultural literacy while creating interesting contextual math and science learning opportunities" (National FFA Organization, n.d., p. 1).

In addition, the incorporation of agricultural education into the total middle school curriculum has called for integration of academic and applied concepts. Connecting what students learn through interdisciplinary links in school, real-world connections, and associations to the real-world of work was recommended by the American Association for the Advancement of Sciences (1993). Research findings have supported the argument that the integration of science into agricultural curriculum is an effective way to teach science. "Students taught by integrating agriculture and scientific principles demonstrated higher achievement than did students taught by traditional approaches" (Balschweid, Thompson, & Cole, 2000, p. 37).

The theory base supporting this study is summarized best in principle six of the Caine and Caine (1994) brainbased (compatible) learning framework. According to Caine and Caine, whose theory is similar to much of the empiricistic conjectures relied upon by agricultural education (Dewey, 1938; Doolittle & Camp, 1999; Kolb, 1984; Roberts, 2006; Rogers, 1969), the brain is designed to make sense of the world through experience with the big picture (agriculture) and by paying attention to the details of individual parts (science concepts).

In fact, several studies (Chiasson & Burnett, 2001; Enderlin & Osborne, 1992; Enderlin, Petrea, & Osborne, 1993; Ricketts, Duncan, & Peake, 2006) have determined that the level of achievement in science is heightened through agriscience at the elementary, middle, and secondary levels of public education. For example, using a posttest only control group design, Enderlin and Osborne (1991) studied student science achievement of middle school students, and discovered that agriscience students earned significantly higher science scores. In 1992, Enderlin and Osborne also reported that agriscience students scored significantly higher than traditional students, in part, because of the integrated (complete) curriculum of agriscience.

A study provided by the Georgia Rural Development Council reinforced the need for middle school agricultural education programs in Georgia. Gibbs (2005) reported the following:

> Polling almost 4,000 young students in 157 counties [in Georgia] revealed that 90 percent felt that agriculture was important, 60 percent have not had the opportunity to participate in leadership programs, 67 percent wished there were more after school activities available, and 60 percent wanted to learn skills needed to start a business. …The results helped to determine that agriculture education at this level could very well

help decrease the dropout rate; increase interest in science, math, and leadership, as well as agriculture; assist in integrating career connections and academics; involve more students in personal leadership development, and provide students real-life experiences. (p. 2).

Thompson and Balschweid (2000) discovered that teachers felt content with aligning science lessons in the agriculture program. Results from their study also indicated the most frequent answer received when agriculture teachers in Oregon were asked "what they will have to give up to develop a more integrated science curriculum" was "nothing" (Thompson & Balschweid, p. 76).

Purpose and Objectives

The purpose of this study was to identify and compare science Criterion-Referenced Competency Test (CRCT) scores of middle school students throughout Georgia who were enrolled in schools with and without agricultural education programs. The researchers conducted this study to determine if indeed middle school agriscience curriculum has an impact on students' achievement in the sciences as described by Gibbs (2005). To accomplish this purpose, the following research objectives were developed:

1. Determine selected demographic characteristics and enrollments of middle school students attending schools with and without agricultural education programs in Georgia.
2. Compare CRCT passing rates and scores for students enrolled in middle schools with agricultural education programs and those without agricultural education programs.

Methods and Procedures

The methodology used for this descriptive study was a nonrandom control group posttest design. The target population for this study consisted of students enrolled in the 51 middle schools with agricultural education programs in Georgia and students enrolled at 51 schools without agricultural education programs during the 2004-2005 and 2005-2006 academic years.

At the end of spring semester 2006, 51 middle schools in Georgia provided their students with at least one course in agricultural education during the academic year. The schools with agricultural education programs used in the study represented a census of Georgia middle schools with agricultural education programs. The list of schools was prepared using information from the Georgia agricultural education Web page and information from the University of Georgia Agricultural Leadership, Education, and Communication department.

The 51 schools without agricultural education were selected by purposeful sampling (nonrandom). If there was a county with both a middle school with an agricultural education program and one without an agricultural education program, the school without the agricultural education program was also selected (the other school had already been sampled as one of the 51 schools with an agricultural education program). The remaining schools without agricultural education programs were chosen based on selected demographic and socioeconomic characteristics (percentage of students with disabilities, limited English proficiency, migrants, and free lunch) to have a comparison group similar to the schools with agricultural education programs regarding these demographic characteristics. The rationale behind this sampling choice is based on the notion that demographic and socioeconomic characteristics explain "variations in students' average standardized test scores" (Toutkoushian & Curtis, 2005, p. 259).

Agricultural education, or agriscience, in Georgia middle schools provides students with basic science concepts for applied learning and educates students about agriculture while incorporating core course content into the lessons. The agricultural education middle school curriculum covers the three science topics in Georgia middle school science standards (earth science, life science, and physical science), thus making science learning in agricultural education and science classes comparable according to the science standards in the state.

The researchers used a state created instrument, the Criterion-Referenced Competency Test (CRCT), to compare between groups of schools regarding their students' science level skills and knowledge. The CRCT test taken by students at each grade corresponds to the state standard curriculum for their grade. According to Georgia's Testing Program (2007),

> The CRCT program is designed to measure student acquisition of the knowledge, concepts, and skills set forth in the state curriculum. The testing program serves a dual purpose: 1) diagnosis of individual student and program strengths and weaknesses as related to instruction of the Georgia Performance Standards (GPS) . . . and 2) a measure of the quality of education in the state. (p. 3)

This study relies on the ability of the CRCT to assess how well students acquired scientific knowledge and skills. The CRCT was developed and evaluated by a panel of experts for face and content validity and is used exclusively throughout Georgia to determine student knowledge and comprehension at the middle school level. Reliability and accuracy was based on viewing assessments of posttests applied by other states. Procedures used in administering the CRCT were developed according to educational research. "Key factors taken into consideration include number of answer choices, breaks during testing, and having certain aspects of the assessments read to students by the teacher" (Georgia Department of Education, 2005-2007, ¶7).

Data analyzed included student demographics and enrollment and CRCT science test scores, all taken from the Georgia Department of Education. The researchers used Microsoft Excel and SPSS 15.1 for data organization and analysis, used descriptive statistics (*M* and *SD*), compared means with paired samples *t*-tests (statistical significance was established at 0.05 a priori), and used Cohen's *d* to determine effect size.

This study is not without its limitations. The target population and sampling frame were not the same. Most (but not all) students in schools with agricultural education programs were enrolled in agricultural education classes. Georgia agricultural education programs in middle schools are pursuing many of the same aims stated by Frick (1993), and most have integrated middle school agricultural education into the general school curriculum. The result is that in Georgia middle schools with agricultural education programs, agricultural education classes are incorporated into the class rotation for all students, and most students in the schools take agriculture classes. There are, however, exceptions to this rule, and not all students in these schools take agricultural education classes (band, chorus, or title students in some schools), thus making target population and sampling frames unequivalent.

This study used 51 schools that had agricultural education programs in 2005-2006 and assumed that these schools also had agricultural education programs in 2004-2005. This is not true: Georgia is systematically increasing the number of schools with agricultural education programs every year. In fact, not all the 51 middle schools in the census of schools with agricultural education programs offered agricultural courses during both academic years of the study and in all grades studied.

The researchers chose a purposeful sampling process (according to location and selected demographic characteristics) to have comparable schools. The process followed did not yield equivalent groups, although sampling was purposeful to minimize differences among school groups studied (other than being schools with or without agricultural education programs). There are many confounding factors, and not all differences among schools were balanced with the purposeful sampling.

Findings

To build the comparison group, the researchers chose Georgia middle schools without an agricultural education program based on similar demographics as schools identified as having an agricultural education program. Schools were prioritized first by location (same county as a middle school with an agricultural education program) and then selected by similar student demographics. The demographics used for this purposeful sampling were the following: (1) percentage of students with disabilities, (2) percentage of students with limited English proficiency, (3) percentage of students receiving free lunch, and (4) percentage of students from migrant families. Figure 1 shows the level of similarity of the two groups in the two school years studied regarding the demographics used for sampling purposes.

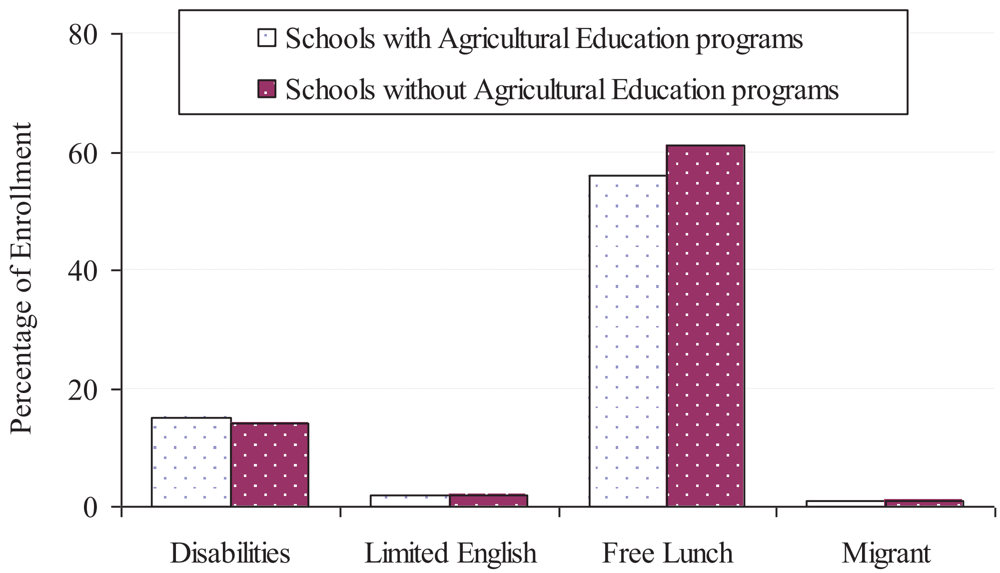

Figure 1. Two-year averages (2004-2005 and 2005-2006) and comparisons between schools with agricultural education programs and schools without agricultural education programs of selected demographics used for purposeful sampling (percentage of students with disabilities, percentage of students with limited English, percentage of students receiving free lunch, and percentage of students from migrant families).

Race was not one of the selected demographic characteristics used for purposeful sampling. Given the correlation between economic status (e.g., percentage of students enrolled who receive free lunch) and race often found in Georgia schools, the researchers were also interested in comparing racial percentages between the two groups. Figure 2 compares the racial distribution between schools with agricultural education programs and schools without.

By selecting for specific characteristics, one could indirectly be selecting for or against other characteristics. The researchers were particularly interested in analyzing how enrollment numbers (size of schools) compared among the two groups. Enrollment numbers by grade and academic year are shown in Table 1.

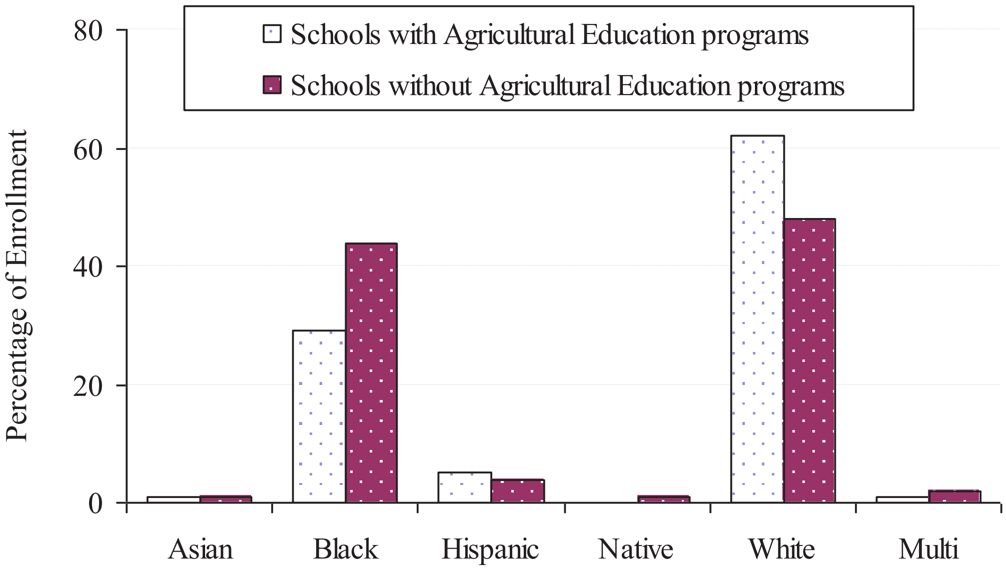

Figure 2. Two-year averages (2004-2005 and 2005-2006) and comparison between schools with agricultural education programs and schools without agricultural education programs of percentage of students who are considered Asian, Black, Hispanic, Native, White, or multi-racial.

Table 1
Student Enrollment Average Numbers by Grade Level in Schools with and without Agricultural Education Programs During School Years 2004-2005 and 2005-2006

	Average student enrollment in schools (*n* = 51)		
	6th grade	7th grade	8th grade
2004-2005			
Schools with ag education programs	235	262	257
Schools without ag education programs	248	267	225
2005-2006			
Schools with ag education programs	253	256	261
Schools without ag education programs	221	227	228

Table 2 shows the means and standard deviations of the percentage of students who did not meet standards (below), met standards (met), and exceeded standards (exceeds) in the results of the CRCT tests by grade level and year.

To compare differences between CRCT students' scores among the schools with agricultural education programs and the selected schools without agricultural education programs, the researcher compounded a new variable, "meeting or exceeding standards," which was the sum of the percentage of students meeting or exceeding standards.

Table 2
Means and Standard Deviations of Percentage of Students WHO Did Not Meet, Met, and Exceeded Standards in the Results of the CRCT Tests by Grade Level and Year

	2005-2006					
	Schools with ag ed (*n* = 51)			Schools without ag ed (*n* = 51)		
	6th grade	7th grade	8th grade	6th grade	7th grade	8th grade
	Mean					
Below	35.71	35.78	20.38	41.38	40.82	25.44
Meets	52.93	46.00	65.34	49.30	44.44	63.02
Exceeds	11.26	18.02	14.82	9.57	15.20	11.44
	Standard Deviation					
Below	12.25	13.04	8.24	15.77	15.10	11.12
Meets	7.00	5.84	4.90	10.54	7.78	6.61
Exceeds	7.72	10.54	8.17	7.03	10.29	7.05

	2004-2005					
	Schools with ag ed (*n* = 51)			Schools without ag ed (*n* = 51)		
	6th grade	7th grade	8th grade	6th grade	7th grade	8th grade
	Mean					
Below	14.38	13.24	21.98	17.02	16.86	26.46
Meets	71.19	71.84	69.16	70.95	69.90	66.50
Exceeds	13.82	14.98	8.70	11.75	13.06	7.06
	Standard Deviation					
Below	7.75	5.81	9.92	8.67	8.21	11.95
Meets	6.36	6.21	6.24	6.91	6.81	8.04
Exceeds	9.17	8.11	5.49	9.12	9.42	6.18

Note. Percentages presented may not equal 100% due to Georgia Department of Education data analysis and reporting.

In 2005-2006, middle schools with agricultural education programs had 64% of sixth graders (*SD* = 12.22), 64% of seventh graders (*SD* = 12.83), and 80% of eighth graders (*SD* = 8.40) that met or exceeded standards on the CRCT science test. In middle schools without agricultural education programs, percentages were as follows: 59% of sixth graders (*SD* = 15.31), 60% of seventh graders (*SD* = 14.91), and 75% of eighth graders (*SD* = 11.19) met or exceeded standards on the CRCT science test.

In 2004-2005, middle schools with agricultural education programs had 85% of sixth graders (*SD* = 7.61), 87% of seventh graders (*SD* = 5.88), and 78% of eighth graders (*SD* = 9.51) that met or exceeded standards in the CRCT science test. In middle schools without agricultural education programs, these percentages were as follows: 83% of sixth graders (*SD* = 8.39), 83% of seventh graders (*SD* = 8.31), and 74% of eighth graders (*SD* = 11.94).

To compare percentages of students meeting standards in schools with agricultural education programs versus schools without agricultural education programs, the researchers did a series of paired sample *t*-tests (95% confidence interval), grouping variables by grade level and year. The pairs were pairs of schools from the same county or pairs of schools paired according to demographic and socioeconomic characteristics. Table 3 shows the results of this analysis.

In all cases, the mean percentage of students meeting or exceeding standards in the CRCT test was higher in the schools with agricultural education programs than in the schools without agricultural education programs (Table 3). This difference was significant for grades six (small effect size) and eight (medium effect size) for the 2006-2006 academic year, and for grades seven (medium effect size) and eight (small effect size) for the 2004-2005 academic year.

Table 3
Results of Paired Samples t-Tests to Compare Percentages of Students Meeting or Exceeding Standards in the Science CRCT Test in Middle Schools with Agricultural Education Programs vs. Schools Without Agricultural Education Programs

	Paired differences (paired samples *t-tests*)							
	M (*Difference*)	*SD* (*Difference*)	95% conf. int. of the difference lower	upper	*t*	df	Sig. (two-tail)	Cohen's *d*
	2005-2006							
6th grade	6.78	19.56	.90	12.66	2.324	44	.025	0.36
7th grade	4.38	20.96	-1.58	10.34	1.478	49	.146	0.29
8th grade	5.70	15.45	1.31	10.09	2.608	49	.012	0.51
	2004-2005							
6th grade	2.96	11.31	-.44	6.35	1.753	44	.087	0.25
7th grade	3.86	10.77	.80	6.92	2.535	49	.014	0.56
8th grade	4.30	15.02	.03	8.57	2.024	49	.048	0.37

Note: df does not correspond to *n* = 51 because there were missing values in some schools for some of the data.

Conclusions, Recommendations, and Implications

In this study, 51 Georgia middle schools with Agricultural Education programs were compared with 51 Georgia middle schools without agricultural education programs. The study focused on comparing the CRCT science test scores between the two groups. The CRCT test scores were used because Georgia middle school science curriculum and performance standards (tested in the CRCT) are integrated into the agricultural education curriculum.

Upon analyzing data collected from the Georgia Department of Education, the researchers concluded that the percentages of students meeting or exceeding the standards were significantly higher in middle schools with agricultural education programs than in schools without agricultural education programs, though the effect sizes were only small or medium. This middle school study builds upon a growing body of research (Chiasson & Burnett, 2001; Conroy & Walker, 1998; Enderlin & Osborne, 1991; Mabie & Baker, 1996; Ricketts et al., 2006), indicating that participation in agricultural education can improve student achievement in science.

The results of the study suggest that there may be a relationship between participation in agricultural education and science CRCT scores. However, whether or not the difference in test scores was caused by student participation in agricultural education programs and not other factors could not be determined due to the limitations of the study (target population and sampling frame not equal, sampling error, and confounding factors). The researchers recommend further research regarding the measure of the potential influence of some of the confounding factors that may be at play.

The researchers recommend further research to establish whether or not student participation in agricultural education curriculum has an effect on CRCT test scores in Georgia middle schools. It would be ideal for the researchers to set up a pretest/posttest (random) control group design. If this is not possible, the researchers may use a pretest-posttest, non-equivalent control group design. The pretest would help in better balancing for other confounding factors. One of the limitations of this study was that the target population and the sampling frame were not equal. It is important when collecting data on the population "students taking agricultural education classes in middle school," the researchers only collect data on students enrolled in agriscience classes.

This study analyzed averages of school test scores because individual student test scores were not available. A nested study (by schools and type of agricultural education classes) using individual student test scores would add information to the analysis. Also, a longitudinal study that could determine if changes of individual students through time are affected in different ways by participation in science or agricultural education classes (the CRCT test of one year could serve as pretest score for the next year) would be beneficial to the profession.

Many researchers indicate that integration of science into agricultural curriculum is a more effective way to teach science, and that students taught by integrating agricultural and scientific principles demonstrate higher achievement versus students taught by traditional approaches (Balschweid et al., 2000). This study and similar studies may help further advance the proven benefits of agricultural education programs.

References

American Association for the Advancement of Science. (1993). *Project 2061 - Science for all Americans.* Washington, DC: Author.

Balschweid, M. A., Thompson, G. W., & Cole, R. L. (2000). Agriculture and science integration: A pre-service prescription for contextual learning [Electronic version]. *Journal of Agricultural Education*, *41*(2), 36-45.

Caine, R., & Caine, N. (1994). *Making connections: Teaching and the human brain*. Somerset, NJ: Addison & Wesley.

Chiasson, T. C., & Burnett, M. F. (2001). The influence of enrollment in agriscience courses on the science achievement of high school students. *Journal of Agricultural Education, 42*(1), 61-71.

Committee for Middle School Improvement Programs and the Georgia Department of Education (2005, January). *Middle school programs in agriculture education*. Retrieved January 15, 2007, from the Georgia Agricultural Education Web site: http://aged.ces.uga.edu/Program_Information/Middle%20School%20Development%20Guide.pdf

Conroy, C., & Walker, N. (1998). *National aquaculture curriculum evaluation phase final report*. Ithaca, NY: Cornell.

Dewey, J. (1938). *Experience and education.* New York: Simon and Schuster.

Doolittle, P. E., & Camp, W. G. (1999). Constructivism: The career and technical education perspective. *Journal of Vocational and Technical Education, 16*(1). Retrieved September 11, 2007, from http://scholar.lib.vt.edu/ejournals/JVTE/v16n1/doolittle.html

Enderlin, K. J., & Osborne, E. W. (1991). *Achievement and retention in middle school science students in a laboratory oriented agriculture plant science unit of study.* Paper presented at the Central States 45th Annual Research Conference in Agricultural Education, Springfield, IL.

Enderlin, K. J., & Osborne, E. W. (1992). *Student achievement, attitudes, and thinking skill attainment in an integrated science/agriculture course.* Paper presented at the 19th Annual National Agricultural Education Research Meeting, St. Louis, MO.

Enderlin, K. J., Petrea, R. E., & Osborne, E. W. (1993). *Student and teacher attitude toward and performance in an integrated science/agriculture course.* Paper presented at the 47th Annual Central Region Research Conference in Agricultural Education, St. Louis, MO.

Frick, M. J. (1993). Developing a national framework for a middle school agricultural education curriculum. *Journal of Agricultural Education, 34*(2), 77-84.

Fritz, S., & Moody, L. (1997). Assessment of junior high/middle school Agricultural Education programs in Nebraska [Electronic version]. *Journal of Agricultural Education, 38*(1), 61-65.

Georgia Department of Education (2005-2007). *Criterion-referenced state competency test (CRCT)*. Retrieved March 16, 2007, from http://public.doe.k12.ga.us/ci_testing.aspx?PageReq=CI_TESTING_CRCT

Georgia's Testing Program. (2007). Georgia's Criterion-Referenced Competency Tests. *Georgia Testing Program Newsletter,* p. 3-4. Georgia Department of Education.

Gibbs, H. J. (2005, February). It's not just in high school – Agriculture education in middle school. *Techniques*. Retrieved February 25, 2007, from www.acteonline.org/members/techniques/feb05_feature3.cfm

Kolb, D. (1984). *Experiential learning: Experience as the source for learning and development.* Upper Saddle River, NJ: Prentice Hall.

Mabie, R., & Baker, M. (1996). A comparison of experiential instructional strategies upon the science process skills of urban elementary students. *Journal of Agricultural Education, 37*(2), 1-7.

National Research Council (Committee on Agricultural Education in Secondary Schools, Board on Agriculture). (1988). *Understanding agriculture: New directions for education*, Washington, DC: National Academies Press.

Ricketts, J. C., Duncan, D. W., & Peake, J. P. (2006). Science achievement of high school students in complete programs of agriscience education. *Journal of Agricultural Education, 46*(2), 48-55.

Roberts, T. G. (2006). A philosophical examination of experiential learning theory for agricultural educators. *Journal of Agricultural Education, 47*(1), 17-29.

Rogers, C. R. (1969). *Freedom to learn: A view of what education might become*. Columbus, OH: Charles Merrill.

Rossetti, R., & McCaslin, N. L. (1994). A status report on middle grade agricultural education and FFA programs in the United States [Electronic version]. *Journal of Agricultural Education*, *35*(2), 22-26.

Thompson, G. W., & Balschweid, M. M. (2000). Integrating science into agriculture programs: Implications for addressing state standards ad teacher preparation programs [Electronic version]. *Journal of Agricultural Education, 41*(2), 73-80.

Toutkoushian, R. K., & Curtis, T. (2005). Effects of socioeconomic factors on public high school outcomes and rankings. *Journal of Educational Research, 98*(5), 259-271.

JAMIE RICH is a Middle School Agriscience Teacher at Lee County Middle School, 185 Firetower Road, Leesburg, GA 31762. E-mail: stevensja@lee.k12.ga.us

DENNIS W. DUNCAN is an Associate Professor at the University of Georgia, 106 Four Towers Building, Athens, GA 30602. E-mail: dwd@uga.edu.

MARIA NAVARRO is an Assistant Professor at the University of Georgia, 107 Four Towers Building, Athens, GA 30602. E-mail: mnavarro@uga.edu.

JOHN C. RICKETTS is a TITLE at the University of Georgia, 110 Four Towers Building, Athens, GA 30602. E-mail: jcr@uga.edu.