THE STATUS OF INTEGRATION OF ACADEMIC AND AGRICULTURAL EDUCATION IN NORTH CAROLINA

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ABSTRACT

The purpose of this study was to examine the level of integration of academic education into agricultural education programs and to determine agriculture teachers' opinions regarding integration of academic and vocational education. Agriculture teachers who had Southern Regional Education Board (SREB) grants (N = 32) to integrate academic and vocational education and those who did not have SREB grants (N = 32) were compared. The level of integration of academics into the agricultural education programs was low. Teachers who had SREB grants to integrate academic and vocational education did not have more positive attitudes toward integration of academic and vocational education than teachers who did not receive SREB grants. Types of integration activities conducted, advantages of integration, and barriers to integrating academic and vocational education were also examined.

INTRODUCTION/ THEORETICAL FRAMEWORK

As we enter the 21st century, education is becoming more and more technologically advanced. As a result, effective education cannot be either liberal/academic or technical/vocational. According to Kearns and Doyle (1988), liberal education teaches both traditional academic subjects, such as science and history, and critical thinking and problem-solving skills. Figler (1989) outlined some skills taught in a liberal or academic curriculum that are needed in the workplace, including communications, thinking, valuing, and interviewing skills. Technical or vocational education, on the other hand, teaches skills required for many occupations (Roegge, 1994). Rankin (1993) stated that 97% of all high school students enroll in a vocational course during their high school career, and many students consider vocational goals most important to their future. Vocational and academic integration is a marriage of both types of curricula in order to teach the many skills necessary for students' future successes.

Vocational and academic integration has been supported by the teaching profession and business and industry. The concept of vocational and academic integration has been endorsed by the U.S. Office of Education since the mid 1930's (Moss, 1990). Gable and Ransdell (1993) stated that the concept of vocational and academic integration is supported by educators, business and industry,

and government policy makers. Pritz and Davis (1990) emphasized the equal importance of both academic and vocational skills. They identified both types of skills as being essential in the workplace so that workers would be flexible enough to solve problems and keep up with new technology. Capelli (1990) also stated that both academic and vocational skills were important for students' success in the job market. According to Tremaine (1992), vocational and academic curriculum must integrate in order to meet students' educational needs and make education more meaningful and relevant.

The Southern Regional Education Board (SREB) initiated the "High Schools That Work" program in 1987 in efforts to improve the education career-bound students were receiving. One of the key practices of the initiative was the integration of vocational and academic curricula (Miller, 1997). The program now includes more than 650 high schools in 21 states, all of which are integrating vocational and academic curriculum at some level (Miller). Examples of successful integration of agricultural and academic education include a "Principles of Technology" course in Oklahoma that was designed to be a physics course for agriculture (Bottoms, Presson, & Johnson, 1992). Another example from Tennessee dealt with state-wide curriculum changes that resulted in a course which combined biology, chemistry, and physics with agriculture (Bottoms et al.). Other examples of vocational/academic integrated curricula in agriculture included the Science and Agriculture Curriculum Project formed in 1990 in California (Emery & Linder, 1993), the Agriscience and Natural Resources Education curriculum in Michigan (Elliot, Connors, & Steeby, 1991), the Biological Science Applications in Agriculture curriculum in Illinois (Osborne & Moss, 1991), and the Research Methods in Agriculture curriculum in Apex, North Carolina (Clayton, Clayton, & Newman, 1993).

Although the Carl D. Perkins Vocational and Applied Technology Act of 1990 listed as a priority the integration of vocational and academic curricula, the act did not list specific ways to achieve such integration (Stecher et al., 1994). An obvious way to integrate academics and vocational curricula was to include more academic content in vocational curricula. Vocational and academic integration was also accomplished through team-teaching that involved a vocational teacher and an academic teacher teaching an integrated curriculum together (Bottoms et al., 1992; Freeman, 1992; Grosvenor & Thode, 1986; Martinez & Badeaux, 1992, 1994; Olds & Lightner, 1995; Osborne & Moss, 1991; Selfridge & Stillwagen, 1992; Smith & Hausafus, 1993; Whent, 1992).

A major student benefit of vocational and academic integration is that vocational and academic integration enables students to be better prepared for the job market (Capelli, 1990; Ellington & Henson, 1986; Oswald, 1986; Pritz & Davis, 1990; Steinauer, 1986). According to Tremaine (1992), problem-solving skills, cooperative learning and teamwork, and job-seeking skills are strongly encouraged in the vocational and academic integrated curriculum.

Another benefit of vocational and academic integration is that students learned abstract academic concepts through concrete, real-life examples (Parkhurst, 1986; Pritz & Davis, 1990; Rankin, 1993). Steinauer (1986) stated that vocational and academic integration changes students' opinions about the relevance of academic skills to real-life situations. According to Oswald (1986), students' academic skills are strengthened by vocational and academic integration because more higher-level academic skills are included in vocational and academic integrated curricula than in a traditional vocational curriculum. Several authors reported improved student performance on vocational and academic material as a result of vocational and academic integration (Keeley, 1990; Martinez & Badeaux, 1992, 1994; Olds & Lightner, 1995; Newman & Johnson, 1993; Smith, 1986). In addition, students mastered both vocational and academic competencies at the

same time, thus creating a more efficient education (Oswald, 1986; Parkhurst, 1986). The SREB reported increased student achievement on national assessment tests as a result of vocational and academic integration (Miller, 1997). Schools with integrated programs also "report that dropout rates have decreased as motivation, test scores, grades, and self-esteem have increased" (Keeley, p. 28).

Teachers also benefit from vocational and academic integration. One major teacher benefit is that teachers from two different backgrounds become familiar with each other's work and, as a result, form mutual respect for each other (Bottoms et al., 1992; Parkhurst, 1986; Pritz & Davis, 1990). According to Pritz and Davis and Bottoms et al., vocational and academic integration also provided teachers with more material to use for lessons, thus allowing teachers to be more creative. Perhaps the greatest teacher benefit of vocational and academic integration is that teachers learned to cooperate with each other (Bottoms et al.; Grosvenor & Thode, 1986; Rankin, 1993; Tremaine, 1992). According to Parkhurst, teachers working in vocational and academic integrated programs gained a better understanding of the educational goals that all teachers share.

Despite the many teacher and student benefits of vocational and academic integration, several barriers hinder the progress of vocational and academic integration. Teachers require more time to develop new curriculum, plan activities, research curriculum integration methods, and work with other staff members on vocational and academic integration (Kentta, 1993).

Another major barrier of vocational and academic integration is lack of funding (Grosvenor and Thode, 1986; Pritz and Davis, 1990; Ramsey, 1995). Yet another concern is that the connection between vocational and academic curricula was not made by students (Bottoms, 1992; Pritz & Davis). Other barriers reported by authors are the reluctance of teachers to change and the lack of commitment to the program (Pritz & Davis). Miller (1997) reported some teachers do not believe that curriculum integration will help the career-bound students, the primary target for the integrated curriculum. Bottoms et al. (1992) listed several additional concerns towards vocational and academic integration; included are administrative support, staff development, and program flexibility. Ramsey also identified student graduation requirements, performance-based assessments, and college admission requirements as barriers of vocational and academic integration.

Purpose and Objectives

The primary purpose of this study was to determine the current level of vocational and academic integration achieved in North Carolina secondary public school agricultural departments. A secondary purpose was to compare the opinions of agricultural teachers who did and did not receive SREB grant monies towards vocational and academic integration. Specifically, the following research questions provided a focus for the study:

1. What percentage of the agricultural curriculum includes integrated academic and vocational education competencies as perceived by the agricultural teachers?
2. What methods are used to accomplish vocational and academic integration in North Carolina secondary agricultural departments?
3. What are the teacher benefits of vocational and academic integration as perceived by agricultural teachers?
4. What are the student benefits of vocational and academic integration as perceived by agricultural teachers?

5. What are the barriers of vocational and academic integration as perceived by agricultural teachers?
6. Are agricultural teachers who received SREB grant monies for vocational and academic integration more in favor of vocational and academic integration than agricultural teachers who did not receive the grant monies?

METHODOLOGY

This study was descriptive and explanatory in nature. Survey research methods were used to collect the data. Data related to the research questions were collected from two populations. The first population consisted of all North Carolina secondary public school agricultural teachers who received SREB grant monies for vocational and academic integration (N = 32). A current list of North Carolina public secondary schools which received SREB grant monies for vocational and academic integration was obtained from the North Carolina State Department of Public Instruction. From this list, all schools which had agricultural education programs were selected. The agricultural teachers at these schools were identified using the *North Carolina 1996 Agricultural Education Directory.* All 32 teachers identified were surveyed. The second population consisted of all remaining North Carolina secondary public school agricultural teachers who did not receive SREB grant monies for vocational and academic education (N = 281). All schools with an agricultural education program minus those schools which received SREB grant monies were listed according to state region and agricultural education program size. In each of these regions two lists were made, one for schools with one agricultural education teacher and one for schools with two agricultural education teachers.

Schools with one- and two- teacher agricultural education programs were selected from each region using a table of random numbers. The number of schools selected from each region was determined by the number of schools with agricultural departments in each region that received SREB grants. A total of 23 schools employing 32 agricultural teachers was selected to be the sample for the population of North Carolina public secondary school agricultural teachers who had not received SREB grant monies for vocational and academic integration.

Based upon a review of the literature, an instrument was developed by the researcher to collect data for this study. Some items included in the instrument were adapted from studies conducted by Hartzell (1995), Johnson (1996a & 1996b), Schell and Wicklein (1993), Dormody (1993), and Newman and Johnson (1993). Additional items were developed to address further the research questions of this study. The instrument provided for collection of data related to methods used in integrating vocational and academic education, student and teacher benefits from integration of vocational and academic education, barriers to implementation, and teacher attitudes toward integration of vocational and academic education. Finally, agricultural teachers were asked to estimate the level of vocational and academic curriculum integration achieved at their school using a scale which ranged from 0-100 %. Content validity was established by a panel of experts from the Department of Agricultural and Extension Education at North Carolina State University, the North Carolina State Department of Public Instruction, and the College of Education and Psychology at North Carolina State University. Twenty teachers were randomly selected for a pilot study from the remaining North Carolina secondary agricultural teachers not used in either sample. Internal consistency, as a measure of the reliability of the attitude scale, was established using Cronbach's Alpha ($\hat{\alpha}$ = .94).

Sixty-four North Carolina public secondary school agricultural teachers were mailed questionnaires with an appropriate cover letter and a self-addressed, stamped envelope. This mailing resulted in

36 (56.2%) responses. A follow-up letter was mailed 2 weeks later to those teachers who had not yet responded. The second mailing resulted in an additional 13 (20.3%) responses. A total of 25 teachers who were in SREB schools responded, and 24 teachers in non-SREB schools responded. Nonresponse error was controlled by comparing early and late respondents on the mean attitude scores (Miller & Smith, 1983). A t-test was used to examine each group, and the t-values showed the attitude means were not statistically significant (Borg & Gall, 1989).

Data were summarized using measures of central tendency, variance, and frequencies and percentages. The differences between the two groups, agricultural teachers who did and did not receive SREB grant monies for vocational and academic integration, on research questions number 1 through 5 were measured using a t-test (Glass & Stanley, 1970). Alpha levels were set at .05.

RESULTS

To determine which methods of vocational and academic integration were most used by teachers, several methods of vocational and academic integration were listed. Respondents were asked to indicate their use of the listed vocational and academic integration methods using a four-point Likert-type scale with the following choices: 1 = never used, 2 = used very little, 3 = used sometimes, 4 = used many times. Table 1 contains a complete listing of curriculum integration methods presented in the questionnaire and the mean scores of responses by agricultural teachers who did and did not receive SREB grant monies for vocational and academic integration.

Table 1

Means and Standard Deviations for Items Relating to Methods of Vocational and Academic Curriculum Integration

Integration Technique	SREB Teachers M	SREB Teachers SD	Non-SREB Teachers M	Non-SREB Teachers SD
Increasing the amount of science in agricultural classes	3.48	0.51	3.61	0.58
Increasing the amount of math in agricultural classes	3.36	0.57	3.22	0.83
Increasing the amount of reading and writing activities in agricultural classes	3.25	0.68	3.30	0.73
Using or developing curriculum materials that include more academic content within existing agricultural classes	3.08	0.72	3.32	0.60
Using experimental methods in developing learning activities for students	2.88	0.67	2.65	0.80
Team-teaching with an academic teacher	2.44	0.77	2.04	0.95
Reorganizing curriculum and coordinating with academic teachers so that similar topics are taught concurrently	2.32	0.69	1.74	0.89
Connecting one main topic or theme to all subject areas	2.08	0.91	2.26	1.11

Coordinating with academic teachers to teach higher-level thinking skills at the same time	2.08	0.93	1.70	0.86
Shared planning and teaching with an academic teacher	1.88	0.78	1.70	0.91

Note: 1 = never used, 2 = used very little, 3 = used sometimes, and 4 = used many times

The methods of vocational and academic integration used most by both groups of teachers were those methods which dealt with increasing the level of academic content in agricultural classes. Both groups of teachers used the model "increasing the amount of science in agricultural classes" more than any other model of vocational and academic integration; 100% of SREB teachers and 91% of non-SREB teachers identified this method of vocational and academic integration as being "used sometimes" or "used many times." Ninety-six percent of SREB teachers and 78% of non-SREB teachers identified "increasing the amount of math in agricultural classes" as a curriculum integration method that was "used sometimes" or "used many times." "Increasing the amount of reading and writing activities in agricultural classes" was identified by 88% of SREB teachers and 87% of non-SREB teachers as a curriculum integration method that was often used to integrate vocational and academic education.

In addition, "using or developing curriculum materials that include more academic content within existing agricultural classes" was identified by 79% of SREB teachers and 91% of non-SREB teachers as a method of vocational and academic integration that was "used sometimes" or "used many times." The method of vocational and academic integration least used by both groups was "shared planning and teaching with an academic teacher." Seventy-six percent of SREB teachers and 78% of non-SREB teachers identified this method as one which was "used very little" or "never used." The mean score of both groups of teachers for this item was below the "used very little" level.

To determine which teacher benefits of vocational and academic integration were considered most important by respondents, possible teacher benefits of vocational and academic curriculum integration were listed. Respondents were asked to rank the benefits according to importance. The choices of the ranking scale were as follows: 1 = not important, 2 = slightly important, 3 = moderately important, 4 = very important. Table 2 contains a complete list of mean scores and standard deviations of all respondents for the teacher benefits listed in the questionnaire.

The ranking of the teacher benefits by teachers at schools which received SREB grants for vocational and academic integration and teachers at schools which did not receive SREB grants for vocational and academic integration was almost identical. Both SREB teachers and non-SREB teachers identified "has instructional relevance" as the most important teacher benefit of vocational and academic integration; 86% of both groups of teachers indicated this teacher benefit was "moderately important" or "very important." Seventy-one percent of SREB teachers and 83% of non-SREB teachers identified "has more staff communication" as a "moderately important" to "very important" teacher benefit of vocational and academic integration. According to both groups of teachers, "has more curriculum flexibility" was the least important teacher benefit of vocational and academic integration. This benefit was considered "moderately important" to "very important" by 62% of SREB teachers and 52% of non-SREB teachers.

Table 2

Mean Scores and Standard Deviations for Teacher Benefits of Vocational and Academic Curriculum Integration

Teacher Benefits	SREB Teachers M	SREB Teachers SD	Non-SREB Teachers M	Non-SREB Teachers SD
Has instructional relevance	3.24	0.70	3.36	0.88
Has more staff communication	3.14	0.85	3.30	0.91
Has more resources	2.90	1.00	3.30	0.86
Stays refreshed on academic skills	2.86	1.06	3.26	1.01
Has more curriculum flexibility	2.71	1.01	2.74	1.03

Note: 1 = not important, 2 = slightly important, 3 = moderately important, and 4 = very important when referring to the mean scores.

A list of possible benefits of vocational and academic integration was developed from the literature. Respondents were asked to rank each benefit according to importance using the following scale: 1 = not important, 2 = slightly important, 3 = moderately important, 4 = very important. Table 3 lists mean scores and standard deviations for all student benefits listed in the questionnaire.

For non-SREB teachers, all student benefits earned mean scores above the "moderately important" level. Teachers from SREB schools also rated all student benefits above the "important" level except one; the "retains more information" benefit received a mean score slightly below the "moderately important" level from SREB teachers. Teachers at SREB schools identified "becomes

Table 3

Mean Scores and Standard Deviations for Student Benefits of Vocational and Academic Integration

Student Benefit	SREB Teachers M	SREB Teachers SD	Non-SREB Teachers M	Non-SREB Teachers SD
Becomes better prepared for workforce	3.54	0.66	3.65	0.80
Develops problem-solving skills	3.46	0.66	3.61	0.74
Receives meaningful instruction	3.46	0.66	3.52	0.75
Gains more appreciation for agriculture	3.38	0.58	3.35	0.91
Develops thinking skills	3.38	0.65	3.65	0.73
Gets reinforcement of basic skills	3.33	0.56	3.39	0.92
Becomes well-rounded person	3.25	0.61	3.39	0.98
Gains more appreciation for academics	3.21	0.66	3.26	0.85
Retains more information	2.88	0.80	3.30	1.01

Note: 1 = not important, 2 = slightly important, 3 = moderately important, and 4 = very important.

better prepared for workforce" as the most important student benefit of vocational and academic integration. For teachers at non-SREB schools, "becomes better prepared for workforce" and "develops thinking skills" were both identified as the most important student benefits of vocational and academic integration. Ninety-one percent of non-SREB teachers identified "becomes better prepared for workforce" as a 'moderately important" or "very important" student benefit, and 96% identified "develops thinking skills" as a "moderately important" or "very important" student benefit of vocational and academic integration.

In addition, 92% of SREB teachers and 96% of non-SREB teachers identified "develops problem-solving skills" as a "moderately important" or "very important" student benefit. While the ranking of the student benefits differed somewhat between the two teacher groups, the high mean scores indicate that both groups considered the student benefits of vocational and academic integration to be important.

To determine what agricultural teachers considered to be the most important barriers of vocational and academic integration, respondents were asked to rank potential barriers according to the following scale: 1 = not important, 2 = slightly important, 3 = moderately important, 4 = very important. Table 4 contains a complete list of mean scores and standard deviations for the barriers listed in the questionnaire.

Table 4

Mean Scores and Standard Deviations for Barriers of Vocational and Academic Integration

	SREB Teachers		Non-SREB Teachers	
Barrier	M	SD	M	SD
Time	3.65	0.59	3.48	1.02
Lack of funding	3.28	0.85	3.13	1.16
Lack of faculty support	3.24	0.77	3.00	0.97
Lack of equipment/supplies	3.19	0.87	3.43	0.93
Planning	3.14	1.06	3.04	1.05
Lack of space	2.95	1.07	3.04	1.16
Lack of instructional materials	2.90	0.94	3.14	1.09
Curriculum development	2.86	0.85	3.00	0.77
Lack of parental support	2.71	0.96	2.87	1.22
Staff development/training	2.67	1.06	2.91	0.79
Lack of administrative support	2.57	1.08	2.96	1.09
Evaluation	2.55	0.94	2.61	0.91

Note: 1 = not important, 2 = slightly important, 3 = moderately important, and 4 = very important.

The ranking of barriers of vocational and academic integration by both teachers at SREB schools and teachers at non-SREB schools was similar in many instances. According to both groups of teachers, the largest barrier of vocational and academic integration was "time." This barrier was rated "moderately important" to "important" by 95% of SREB teachers and 81% of non-SREB teachers. Eighty-one percent of SREB teachers and 71% of non-SREB teachers rated "lack of

faculty support" as a "moderately important" or "very important" barrier of vocational and academic integration. For the "lack of funding" barrier, 86% of SREB teachers and 70% of non-SREB teachers had rating scores of "moderately important" to "very important." Seventy-one percent of SREB teachers and 83% of non-SREB teachers identified "lack of equipment/supplies" as a moderately important to very important barrier of vocational and academic integration. "Planning" was identified by 81% of SREB teachers and 70% of non-SREB teachers as being a "moderately important" to "very important" barrier of vocational and academic integration. The least important barrier of vocational and academic integration according to both groups of teachers was "evaluation;" 42% of SREB teachers and 54% of non-SREB teachers identified evaluation as a "moderately important" to "very important" barrier of vocational and academic integration.

To determine the attitudes of agricultural teachers towards vocational and academic integration and whether teachers from SREB schools were more in favor of vocational and academic integration than teachers from non-SREB schools, 25 attitude statements concerning vocational and academic integration were listed. Teachers were asked to respond to each statement using the following 4-point attitude scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. Negatively stated items were reverse coded for data analysis. Table 5 contains mean scores and standard deviations for all attitude statements listed in the attitude section of the questionnaire.

Teachers from schools which received SREB grants for vocational and academic integration most strongly agreed with the statement "vocational and academic integration enhances my agricultural program's image" ($\underline{M} = 3.16$). Ninety-six percent of these teachers "agreed" or "strongly agreed" with this statement. For the same statement, agricultural teachers from schools which did not receive SREB grants had a mean score of 3.09; 74% of these teachers indicated that they "agreed" or "strongly agreed" with this statement.

Table 5

Mean Scores and Standard Deviations for Attitudes Towards Vocational and Academic Integration

Attitude Statement	SREB Teachers M	SD	Non-SREB Teachers M	SD
Vocational and academic integration enhances my agricultural program's image	3.16	0.47	3.09	0.74
Vocational and academic integration is adaptable to an ever-changing workforce	3.08	0.50	3.17	0.51
Vocational and academic integrated curricula is challenging to average-ability students	3.04	0.45	3.04	0.45
Vocational and academic integration better prepares students for employment	3.00	0.51	3.00	0.55
Vocational and academic integration does not meet the needs of my students**	2.96	0.64	3.05	0.78
Vocational and academic integrated curricula is challenging to low-ability students	2.96	0.73	2.57	0.87
Student achievement is not really affected by vocational and academic integration**	2.88	0.54	3.05	0.51
Vocational and academic integrated curriculum is an efficient way to teach students	2.88	0.61	2.83	0.51

The vocational and academic integrated program has enabled students to better understand that math, science, and agriculture are highly related	2.84	0.55	2.86	0.75
The vocational and academic integrated program has enabled students to value the worth of math, science, and agriculture in today's society	2.80	0.58	2.76	0.72
At this school the academic teachers do not want to work with the agriculture teachers on vocational and academic integration**	2.80	0.71	2.86	0.69
Vocational and academic integrated curricula is challenging to high-ability students	2.76	0.66	3.30	0.46
Vocational and academic integration prevents the teaching of important vocational skills**	2.75	0.53	2.91	0.70
The vocational and academic integrated program has enabled myself and math and science teachers to work together as a team	2.64	0.64	2.24	0.89
Students in a vocational and academic integrated program learn more than students not in a vocational and academic integrated program	2.62	0.71	2.71	0.66
Vocational and academic integration requires me to incorporate more science material into my agricultural curriculum	2.60	0.58	3.17	0.70
Vocational and academic integration causes me to teach fewer practical skills**	2.56	0.77	2.65	0.86
Vocational and academic integration allows me to be flexible with my curriculum	2.52	0.67	2.52	0.76
I enjoy teaching vocational and academic integrated curricula more than previous curricula	2.48	0.65	2.59	0.68
Vocational and academic integration takes too much time**	2.45	0.83	2.81	0.51
Adequate curriculum materials are available for the integration of vocational and academic subjects	2.42	0.65	2.13	0.73
I prefer to teach vocational and academic integrated curriculum instead of the traditional ag curriculum	2.39	0.66	2.43	0.75
Student class participation has increased due to vocational and academic integration	2.26	0.54	2.20	0.71
I have adequate equipment and supplies in my department for teaching integrated curricula	2.16	0.75	1.96	0.71
Student enrollment in my department has increased due to vocational and academic integration	2.04	0.73	2.00	0.86

Note: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree.
**negative items; these items were reverse coded for data analysis

Teachers from both groups also agreed with the statement "vocational and academic integrated curricula is challenging to average-ability students." Ninety-two percent of the teachers from SREB schools and 91% of the teachers from non-SREB schools agreed or strongly agreed with this statement. Another attitude statement that both teacher groups agreed with was "vocational and academic integration better prepares students for employment."

Both teachers from SREB schools and teachers from non-SREB schools disagreed with many of the same attitude statements. Sixty-four percent of the teachers from SREB schools disagreed or strongly disagreed with the statement "student class participation has increased due to vocational and academic integration." For the same statement, 57% of the teachers from non-SREB schools had scores which indicated they disagreed or strongly disagreed. Teachers from both groups also disagreed with the statement "I have adequate equipment and supplies in my department for teaching vocational and academic integrated curricula." Also, 80% of SREB teachers and 70% of non-SREB teachers indicated that they disagreed or strongly disagreed with the statement "student enrollment has increased due to vocational and academic integration."

A mean attitude score was calculated for each group of teachers to determine if the attitudes of each group towards vocational and academic integration differed. The mean attitude score for agricultural teachers from schools which received SREB grants for vocational and academic integration was 2.68 ($\underline{SD}$ = 0.21). The mean attitude score for agricultural teachers from schools which did not receive SREB grants for vocational and academic integration was 2.69 ($\underline{SD}$ = 0.28). A t-test was calculated to determine if the difference in mean scores between the two groups of teachers was significant. The resulting t-value of 0.90 was not statistically significant, indicating there was no difference between the two groups of teachers on attitudes towards vocational and academic integration.

To determine what level of vocational and academic integration agricultural teachers were achieving, the respondents were asked to indicate by a percent number the level of vocational and academic integration achieved in their agricultural departments. Respondents were allowed to choose between 0 and 100%. Teachers from schools which received SREB grants for vocational and academic integration had percentages ranging from 5 to 87.5%. The mean vocational and academic integration level for SREB teachers was 36.25%. Teachers from schools which did not receive SREB grants for vocational and academic integration had percentages ranging from 0 to 90%. The mean score for non-SREB teachers was 39.13%.

CONCLUSIONS

Agricultural teachers in North Carolina are using a variety of methods to integrate vocational and academic curriculum in their programs. Infusion of academic content into the existing vocational curriculum is the predominant method of achieving vocational and academic integration. Agricultural teachers perceive that teachers and students benefit from vocational and academic integration. Several teacher benefits from vocational and academic integration were considered important by North Carolina public secondary school agricultural teachers, with instructional relevance as the most important teacher benefit from vocational and academic integration. The most important student benefits from vocational and academic integration according to agricultural teachers were those which dealt with workforce preparation of and higher-level skill development by students. However, the teachers were not as convinced that students retain more information as a result of this approach.

Agricultural teachers felt there were significant barriers to vocational and academic integration. A majority of the most important barriers dealt with time, and administrative and financial support of this initiative. However, receiving a grant for vocational and academic integration does not affect teacher attitudes towards vocational and academic integration or the level of vocational and academic integration achieved.

Overall, the level of vocational and academic integration in North Carolina secondary public school agricultural departments is fair. North Carolina secondary public school agricultural teachers are not strongly in favor of vocational and academic integration. The lack of strong teacher support of this educational reform may be related to the many barriers teachers encounter when attempting to integrate vocational and academic curricula.

IMPLICATIONS

A variety of models for integration of academic and vocational education were found in the literature. Agriculture teachers in this study were using a variety of models to accomplish academic integration into their programs.

The finding in this study that students benefit most from academic and vocational education integration in the area of workforce preparation supports the previous findings of Capelli (1990), Ellington and Henson (1986), Oswald (1986), Pritz and Davis (1990), and Steinauer (1986). This perception disagrees with Miller's (1997) finding that some teachers do not feel integration of academic and vocational education benefits career-bound students. Agriculture teachers also perceived that higher levels of academic skills were developed among students, which is consistent with the findings of Oswald, Martinez and Badeaux (1994), and Olds and Lightner (1995).

The major barriers of time and funding for equipment and supplies identified by Kentta (1993), Grosvenor and Thode (1986), and Ramsey (1995) were supported by the findings of this study. Apparently, agriculture teachers are similar to other teachers in expressing this concern related to their ability to implement an integrated academic and vocational education curriculum.

RECOMMENDATIONS

North Carolina secondary public school agricultural teachers should be allotted more time to implement vocational and academic integration. This may require additional planning time or a reduction in other expectations related to non-instructional assignments. In addition, school administrators must communicate support for integration of vocational and academic education in tangible ways, including funding for programs, equipment, and supplies.

The State Department of Public Instruction and the State Agricultural Education staff should continue to provide guidance on improving the implementation of vocational and academic integration. The expectation for the level of integration of vocational and academic teachers should be clearly communicated to teachers. Teacher workshops should be focused on training teachers to use specific models of vocational and academic integration and reducing time requirements of vocational and academic integration.

A study should be conducted to determine which model(s) of vocational and academic integration result in the highest student achievement gains. Results of that study would be used to determine which methods of vocational and academic integration should be emphasized at teacher-training workshops.

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