Dual Enrollment and Dual Credit in Agricultural Education in Tennessee

A Research Paper Submitted to the Faculty of The University of Tennessee at Martin, Fulfiling Requirements for the Master of Science in Agriculture and Natural Resources Systems Management Concentration: Agricultural Education and Leadership

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Abstract

Dual enrollment (DE) and dual credit (DC) are similar programs in which high school students are taught college level material and given an opportunity to receive college credit. The push to make a seamless transition from secondary to post-secondary education is becoming a mainstream practice across the United States and DE/DC programs can help with this transition. To examine the prevalence of DE and DC programs within agricultural education programs in the state of Tennessee, a survey was distributed to agricultural education teachers during the 2011 Summer Career and Technical Conference. The survey found that 62%, or 72 teachers surveyed, taught at schools that offered DE/DC programs. Agriculture departments that did not offer DE/DC did so because of lack of interest by their students. Teachers also indicated that the cost to the students was a limiting factor. There was a significant (p < 0.001) relationship between school classification and participation in DE/DC programs. Schools classified as urban had a higher rate of participation in DE/DC programs than did schools classified as suburban or rural. There was also a significant (p < 0.001) relationship between school size and DE/DC participation. Smaller schools (with 1 to 200 students) and larger schools (with more than 1000 students) had higher participation rates than mid-sized schools (with 200 to 1000 students). Survey respondents indicated that most of the students who took DE/DC courses continued their education with the partnering institution after they graduated from high school. Teachers also indicated that DE/DC programs were beneficial to the students, to the post-secondary institution and to the high school agricultural education program. Therefore, the implementation and continuation of DE and DC programs in agricultural education and CTE in Tennessee should be encouraged.
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Introduction:

Dual enrollment (DE) and dual credit (DC) are similar programs in which high school students are taught college level material and given a chance to receive college credit. The difference is in the way that the two programs are administered. In DE, the student is enrolled in both high school and college, must pay tuition fees to the postsecondary institution, and a college professor usually teaches the course. DC differs in that students are taught the college level material by their high school teacher. Then, if they desire, they can pay to take a competency attainment test. If they pass this test, they will be granted college credit. DE and DC opportunities for high school students have been at the forefront of education in the past few years. Career and Technical Education (CTE), is no different. Historically, CTE has not been cast in the best light, but lately state leaders and CTE supporters have helped to strengthen CTE programs. One of the best ways that the programs have become more beneficial to students is through articulation agreements. Articulation agreements are contracts between postsecondary institutions and high schools that define the way courses will be offered. These agreements guarantee that students receive credit upon successful completion of the requirements as stated in the agreement. DE and DC opportunities have increased across CTE programs in Tennessee. This is not just a local effort though. The push to make a seamless transition from secondary to post secondary education is becoming a mainstream practice across the U.S.
Literature Review:

Research has shown that students taking dual enrollment/dual credit courses in high school have an advantage in completing their degree in college and in earning their high school diploma (Karp et al., 2007). Students who drop out of school, get their GED, and become successful members of society are less common today. Students who want to enter into a vocation rather than attend a four-year postsecondary institution still need a minimum of a high school diploma. DE and DC were once limited to high-achieving students and are now used to support postsecondary preparation for average and CTE students as well (Karp et al., 2007). Students need the best start they can get in life. Providing them with the opportunity to gain credit toward their future is very important in today’s highly competitive job market. State leaders, legislators and educational institutions have shown great support for these programs and it is evident that CTE and agriculture education are no different.

Agriculture Education:

The agricultural world has evolved into one of the most technologically advanced industries in the world. The days of just feeding animals or driving a tractor through the field are almost over. In animal agriculture, for example, vaccinations, feed additives, and technologically advanced herd management and animal tracking systems are rapidly becoming the norm. Row crop farming has become even more advanced with GPS driven vehicles and the advancement of precision agriculture. Efficiency is the name of the game in the agricultural world today. Due to increased fuel and fertilizer costs, automated implement operating systems and GPS guidance systems are helping to make each pass through the field more important. These advances require an increased level of education, which often means advanced training. High school students need to take advantage of dual enrollment and dual credit programs to help decrease the time they
spend in college, thus preparing them for the world of work more quickly. Agricultural education is a large part of CTE in the state of Tennessee. In 2009-2010, 35,676 students in Tennessee were enrolled in agriculture education courses, which make up 8.95% of CTE courses (CTE Report Card, 2010).

One of the major disadvantages that face many high school agriculture students today is their distance from the colleges and universities they would like to attend. Much of the U.S. is still rural which sometimes does not lend itself for convenience to postsecondary education. Can DE and DC programs help this situation? DE programs are currently receiving support from policy makers, educators, and foundations to increase academic rigor in high school. This increased academic rigor will help low-achieving students meet academic standards, provide more opportunities to low income students, help students become accustomed to college life, and reduce the cost of college (CCRC, 2007). A study of rural high school students, with regard to dual enrollment opportunities, showed that students participating in DE courses made a better transition from high school to postsecondary institutions (Johnson & Brophy, 2006). Even rural communities, like much of Tennessee, still produce degree seeking students.

Seamless Transition:

An article by The Education Resources Institute, (TERi, 2007) discusses the importance of a seamless transition from P-12 (pre-kindergarten through 12th grade) education to post-secondary institutions. Some of the students that take advantage of DE programs are the first members of their families to attend college in any capacity. P-16 (pre-kindergarten through year four of college) alignment seeks to bridge the P-12 and postsecondary educational sectors in three critical areas: academic standards and curriculum expectations, testing and assessment, and
early college opportunities (TERi, 2007). This push to make a seamless transition throughout a student’s educational career further strengthens the need for DE programs in high schools.

*Degree attainment:*

A study conducted by the National Research Center for Career and Technical Education showed that CTE students who were dually enrolled were much more likely to progress toward degree attainment during post secondary education (Karp et al., 2007). Dual enrollment participation in high school also increases the likelihood that students will enroll in a four-year institution and increases the likelihood that students will earn a degree from post-secondary education (Karp et al., 2007). Students participating in DE programs were 11% (p < 0.01) more likely to persist through the second year of college, and were 12% (p < 0.001) more likely to enter college within seven months of high school graduation. By accumulating credits in high school, students create a nest egg effect, thereby influencing their decision to remain in college (Swanson, 2011). It is reasonable to assume that a student who can start college earlier will stick with it and finish what he/she started. Another factor to consider is that by helping high school students become more familiar with the way the college system works, they will have a much easier time adjusting to college life once they get on campus as a full time student.

*Tennessee CTE:*

Many of today’s high school students are not on academic pathways; thus they can suffer from the lack of dual enrollment opportunities. CTE academic standards have increased the relevance and rigor of CTE classes. Dual enrollment courses can help CTE curriculum by providing students with access to rigorous college courses (Karp & Hughes, 2008). According to the latest data compiled by the Tennessee Career and Technical Education Department in 2008-
2009, 5,554 CTE students in Tennessee were enrolled in college courses while still in high school. In 2009-2010, the number of CTE students enrolled in DE/DC courses increased to 9,165 students (Tennessee Career and Technical Education, 2011). CTE students are taking advantage of opportunities to prepare themselves for college.

_Tuition costs:_

Increases in the number of students attending college and gaining a degree are not the only important result of dual enrollment or dual credit programs. If you consider the savings in tuition a student can gain by taking these courses while still in high school, the benefits become even greater. College educational costs are steadily increasing every year and without programs like dual enrollment or dual credit some students would be unable to afford the tuition fees. Take Kris Douglas, for example. Kris graduated from high school with a high school diploma and an associate’s degree from John Wood Community College. This reduced her four-year degree program by two years and helped to save her thousands of dollars in the process (Gilroy, 2005).

Given the national problem with college retention and completion, the fostering of relationships between high school students and colleges can only be regarded as a positive step (Hughes, 2010). Studies have shown that low-income students benefited greatly from dual enrollment programs (Karp et al., 2007). In today’s stressed economic conditions, it is even more important to save money on a college education. The financial savings can extend into a dual enrollment student’s college career as well. For example, the University of Tennessee at Martin offers scholarships to students who continue their education with them after the high school students have completed dual enrollment credits at the secondary level.
Objectives:

The objectives of this research were to determine how many agricultural education departments offer dual enrollment/dual credit programs, and determine factors that affected the programs being offered. Also, the research will look at which postsecondary institutions and which courses have the highest enrollment.
Materials and Methods:

A dual enrollment and dual credit survey (appendix) was distributed at the 2011 Summer Career and Technical Conference in Murfreesboro, TN, on the campus of Middle Tennessee State University during the final session of the Tennessee Association of Agricultural Educators business meeting. This survey was approved by the University of Tennessee at Martin’s Institutional Review Board (IRB approval number 11-79-EOS/Piat,Bre). The survey was distributed to all teachers at the business meeting. The survey consisted of 38 multiple choice questions that ranged from questions on teacher and school demographics to questions regarding dual enrollment and dual credit opportunities available to Tennessee agricultural education students. The survey questioned teachers about course offerings, which college or universities they partnered with, if the students were successful in their respective courses, which courses had the highest enrollment, how many students took advantage of the dual enrollment/dual credit opportunity, if the teachers felt that it was beneficial to their local program, students and partnering institution, how the courses were taught, if the teachers received a stipend for offering these courses, and if the students continued on into post secondary education. The teachers were asked to complete the anonymous survey and by doing so they had a chance to win a twenty-five dollar Wal-Mart gift card.

Data Analysis:

Survey results were recorded for 121 out of 220 agricultural education teachers registered for summer conference. The meeting was a representative sample of the agriculture teachers from across the state. After the completed surveys were collected, the answers for each question were given a numeric code. The coded data were entered into an Excel 2007 worksheet, and the results were analyzed using the count-if statistical formula. Upon completing the count-if
statistical formula, the percentage breakdown for each question was determined. After evaluating the data, a chi-square test was used to examine relationships among important factors.
Results:

Teacher demographics:

Of the 121 Tennessee agricultural education teachers surveyed, 71% were males (Figure 1). The highest percentage (22%) of surveyed teachers were 51-55 years of age followed by 16% in the 20-25 year old category (Figure 2). Of the teachers surveyed, 42% of teachers hold a Bachelors degree, and 36% have a Masters degree (Figure 3). Even though there were many agriculture teachers in the 51-55 year age group, 28% of teachers had only 1-5 years of teaching experience (Figure 4). Perhaps some teachers are entering the teaching profession as a second career.

Figure 1. Gender of agriculture teachers in Tennessee.
Figure 2. Distribution of respondents’ ages.

Figure 3. Distribution of respondents’ educational experience.
School Demographics:

For school demographics, the data showed that 53% of schools had populations ranging from 200-1000 students (Figure 5). This statistic shows that the majority of schools in which the respondents teach are mid-sized with respect to school population. Schools were classified as rural 62% of the time (Figure 6). For these rural schools, distance from major postsecondary institutions can be a factor in DE enrollment. According to the survey respondents, 76% of agriculture departments consist of one to two teachers. Forty-one percent of agriculture departments serve 100-200 unduplicated agricultural education students (Figure 7). Unduplicated student numbers represent the number of students who take agriculture education classes per year (students taking more than one class are not counted twice).
Figure 5. Distribution of school populations among respondents’ schools.

Figure 6. Distribution of school classification among respondents’ schools.
Dual Enrollment/Dual Credit:

The survey found that 62%, or 72 teachers surveyed, taught at schools that offered dual enrollment and dual credit programs in agriculture. Participation was distributed evenly between DE and DC. School classification was found to have a significant (p < 0.001) relationship with DE/DC participation. As reported earlier, rural schools make up 62% of Tennessee schools surveyed. When comparing urban, suburban and rural schools, schools had 86%, 62%, and 56% participation, respectively (Figure 8). There was also a significant (p < 0.001) relationship between school size and participation in DE/DC (Figure 9). Seventy-one percent of schools with populations of 1-200 students participated in DE/DC programs. However they made up only 6% of the schools in this survey.

Agriculture departments that did not offer DE/DC did so because of lack of interest by their students. All Tennessee CTE departments are required to have articulation agreements in
Figure 8. Relationship between school classification and participation in DE/DC programs. Chi-square p-value = $3.43 \times 10^{-15}$

Figure 9. Relationship between school size and participation in DE/DC programs. Chi-squared p-value = $9.7 \times 10^{-10}$
place, but this does not mean that students have to take advantage of the opportunity. The teachers that reported that they did not offer DE/DC did report an interest in offering these programs. Only 4 respondents refused to offer DE/DC.

The majority of agriculture education programs have 1-5 students take advantage of DE/DC opportunities annually (Figure 10). Of these, teachers reported that 17% of students received nine or more credit hours while in high school. The survey also showed that 60% of students continued their education with the partnering institution with which they received post-secondary credit (Figure 11). This statistic alone shows the importance of DE and DC to agricultural education and postsecondary institutions. If educators can get more students to further their education through this program, it would benefit recruitment.

Figure 10. Distribution of the number of students enrolled in DE/DC annually.
Teachers did, however, express a concern regarding cost of enrollment in the programs. Seventy percent of teachers said that cost impacted the enrollment for DE/DC courses. Most students (73%) paid $1-$200 per course. Teachers reported that most students primarily received a grade of B or above and those that did fail did so because of lack of effort on their part. The survey revealed that of all the students participating in the DE program, 89% of students received college credit. Students participating in DC received college credit 58% of the time, but if you take into account that the students only receive credit if they pay to take the competency test this statistic is still reasonable. Teachers reported that the number of students participating in the DE/DC program had increased since it was established in their respective schools.

The high schools represented by the survey respondents are currently offering fifteen college level courses (Figure 12), with the highest enrollment being in greenhouse management.
and livestock (Figure 13). Teachers reported that they were the primary instructor in the majority of the courses offered. They also stated that they thought that it was a benefit to the students, their own agricultural education programs, and the post-secondary institutions (Figure 14). Of all the institutions listed on the survey and others provided by the high school teachers, Middle Tennessee State University and the University of Tennessee at Martin were the top two schools with participation of 39% and 30%, respectively (Figure 15). The last question on the survey revealed that 64% of the teachers feel that in-service training would be beneficial to the inception and retention of dual enrollment and dual credit programs across the state.

Figure 12. Number of times DE/DC courses are offered.
Figure 13. Enrollment within DE/DC courses.

Figure 14. Percentage of teacher responses regarding benefit of DE/DC programs.
Figure 15. Percentage of enrollment in DE/DC courses by post-secondary institutions.
Conclusion:

Many of today’s high schools students are not on academic pathways, which can be defined as pathways that include all core academic courses as well as college preparatory courses. Student not enrolled in college preparatory classes can suffer from the lack of DE/DC opportunities. CTE education is striving to increase the relevance and rigor of its classes. The implementation and availability of DE and DC courses is an important step in helping students continue their education past the secondary level. DE and DC programs are believed to be beneficial to students by 98% of the agricultural education teachers surveyed. In the 2009-2010 school year, almost 425 agriculture education students were enrolled in some type of DE or DC course across the state (Tennessee Career and Technical Education, 2010). This is a testament to how CTE and agricultural education is on the forefront of college readiness for our students across the state.

According to the teachers in this survey, cost is a limiting factor regarding enrollment into DE/DC programs. Seventy percent of teachers felt that enrollment was affected by the cost of the programs, even though 73% of teachers stated that the cost per student ranged from $1 to $200 per course. Students attending public schools in Tennessee are not familiar with tuition fees, thus paying for a class while they are still in high school seems out of context to them. This factor needs to be addressed further through parent meetings, guidance office visits, and visits from postsecondary institutions to help educate students and parents about the cost savings of DE/DC programs. The parents and students need to become aware of how much money they can save themselves by receiving college credit while in high school.

Currently in agricultural education, 15 courses are offered to high school students across the state. This number gives the students an opportunity to gain multiple college credit hours
before high school graduation. Of the 64 teachers that responded to the question regarding the maximum number of credits earned by an individual student, 17% said that they had students that earned nine or more credit hours while still in high school.

The benefits for all parties involved in this program are predominantly positive. Ninety-seven percent of teachers felt that DE/DC programs were beneficial to all involved. Agriculture education programs that offer the DE/DC programs are benefited by adding rigor and relevancy to their programs. Students benefited through, not only cost savings, but also gaining credit toward a college degree. Finally, postsecondary institutions gained students that are more likely to continue their education with them after high school. Ninety-three percent of teachers felt that DE/DC programs were good recruitment tools for post-secondary institutions.

This study helped to shed some light on DE/DC programs and their importance to Tennessee high school students. The future of America is in school today and educators across the state are doing all they can to make sure that the future is bright for Tennessee.
References


Appendix

Dual Enrollment/Credit Survey

This survey is part of the research project being completed by Bret Piatt, a student in the Master of Science in Agriculture and Natural Resources Systems Management (MSANR) program at the University of Tennessee at Martin. The purpose of this study is to describe the agricultural educator’s attitudes and knowledge of Dual Enrollment/Dual Credit in Tennessee. The Survey is completely voluntary, you may withdraw at any time and you may abstain from answering any questions you wish. Please complete the following survey. It will only take about 5-10 minutes of your time. Thank for your participation. Bret Piatt

Please Circle the best answer for each of the following questions.

1. Gender
   a. Male
   b. Female

2. Age
   a. 20-25
   b. 26-30
   c. 36-40
   d. 41-45
   e. 46-50
   f. 51-55
   g. 56-60
   h. 60+

3. Educational Background
   a. B.S. Degree
   b. Masters Degree
   c. Masters +30
   d. Masters +45
   e. EDS
   f. Ph.D.

4. Total Years Teaching
   a. 1-5
   b. 6-10
   c. 11-15
   d. 16-20
   e. 21-25
   f. 26-30
   g. 31-35
   h. 36+
5. What is the size of your school’s student population?
   a. 1-200
   b. 200-1000
   c. Over 1000

6. How many unduplicated agricultural education students do you have enrolled in your program?
   a. Less than 100
   b. 100-200
   c. Over 200

7. How many agricultural education teachers does your school employ?
   a. 1
   b. 2
   c. More than 2

8. How would you classify your school
   a. Urban
   b. Suburban
   c. Rural

9. Do you offer Dual enrollment/credit opportunities at you school?
   a. Yes
   b. No

10. If you answered yes to #9 which one do you offer.
    a. Dual Enrollment
    b. Dual Credit

11. If you answered no to #9 which reason best describes your situation?
    a. Lack of interest by students
    b. Cost to students
    c. Will not fit in schedule because other classes are full
    d. School system does not allow

12. If you had the chance, would you be willing to facilitate dual enrollment courses at you school?
    a. Yes
    b. No
    c. Depends of the terms of the agreement

13. How many students do you enroll annually in Dual enrollment courses?
    a. 1-5
    b. 5-10
    c. More than 10

14. Which college/university do you work with?
    a. University of TN at Martin
    b. Middle TN State University
    c. Tennessee Technological University
    d. Milligan College
    e. Other ____________________
15. What Dual enrollment/credit course(s) do you offer at your school? (choose all that apply)
   a. Greenhouse Management
   b. Agricultural Business/Finances
   c. Livestock management
   d. Small animal Care
   e. Agricultural economics
   f. Agricultural Sales & Marketing
   g. Plant and Soil Science
   h. Forestry Management
   i. Horse Science
   j. Wildlife management and Rec.
   k. Veterinary Science

16. For all you answered in #15 which Dual enrollment/credit course(s) have the highest enrollment (choose all that apply)
   a. Greenhouse Management
   b. Agricultural Business/Finances
   c. Livestock management
   d. Small animal Care
   e. Agricultural economics
   f. Agricultural Sales & Marketing
   g. Plant and Soil Science
   h. Forestry Management
   i. Horse Science
   j. Wildlife management and Rec.
   k. Veterinary Science

17. How many of your students that complete dual enrollment in high school continue on to post-secondary institutions?
   a. All
   b. Few
   c. None
   Give a percentage __________%

18. What grade do your students average in the dual enrollment course
   a. A
   b. B
   c. C or below

19. Did all of your students receive college credit?
   a. Yes
   b. No

20. If you answered no to number 19 why?
   a. Material too difficult
   b. Student failed do to lack of effort
   c. Combination of both a & b.

21. How many students that took advantage of dual enrollment credit major in agriculture in post-secondary education?
   a. All
   b. 75% or more
   c. Less than 75%

22. What are the maximum credit hours that any one student has received in high school through your dual enrollment program?
   a. 3
   b. 6
   c. 9 or more

23. Did your students that participated in dual enrollment continue their education with the school that you partnered with?
   a. Yes
   b. No
24. What was the average cost per credit hour for students in your school?
   a. Free
   b. $1-$200
   c. More than $200

25. Does the cost per student effect the rate of enrollment at you school?
   a. Yes
   b. No
   c. Does not effect

26. Have your dual enrollment numbers grown since your began the program?
   a. Yes
   b. No
   c. Stayed the same

27. What percentage of students that participated, go one to receive a degree?
   a. 100%
   b. More than 75%
   c. Less than 75%

28. How is the course taught through your partner institution?
   a. Completely online
   b. Online with paper tests
   c. No online content, all paper material?

29. Do you receive a stipend to facilitate these courses?
   a. Yes
   b. No

30. If yes to number 29 would you continue to offer courses if a stipend was not offered?
   a. Yes
   b. No

31. Offering dual enrollment opportunities is beneficial to your local Agriculture program?
   a. Yes
   b. No
   c. Does not effect

32. Has dual enrollment encourages more students to enroll in you agriculture program
   a. Yes
   b. No

33. Are you the teachers of the course or do you just facilitate the course and professors do the teaching?
   a. I teach the course
   b. Professors teach the course
   c. I assist the professor in teaching the course

34. Offering dual enrollment/credit courses are a good recruitment tool for post-secondary institutions?
   a. Yes
   b. No

35. Do your students have to purchase books and materials to complete the course
   a. Yes
   b. No, none are needed
   c. No partner institutions provide then to the students
36. Is it beneficial for high school students to participate in these courses?
   a. Yes
   b. No

37. Is the dual enrollment/credit program beneficial to the institutions that you work with?
   a. Yes
   b. No
   c. Undecided

38. If available would you like in-service training regarding dual enrollment/credit opportunities?
   a. Yes
   b. No
   c. Not needed