

AN ANALYSIS OF THE IMPACT OF HIGH SCHOOL DUAL ENROLLMENT  
COURSE PARTICIPATION ON POST-SECONDARY ACADEMIC SUCCESS,  
PERSISTENCE AND DEGREE COMPLETION

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**Executive Summary**

On February 27, 2005, participants at the National Governor's Conference initiated a national conversation regarding the preparation of American high school students for post-secondary education. More recently, the Western Interstate Commission for Higher Education, the Education Commission of the States, and Achieve, Inc., amongst others, have surveyed state governments and their policies to investigate connections established throughout the educational system, from pre-school through at least four years past high school (P-16) and in some cases into the graduate school years (P-20). Creating data systems to follow students throughout their educational careers in order to attempt to unlock key issues that lead to success or failure of post-secondary education have the potential to not only aid the national discussion regarding post-secondary success, but in this age of spiraling college tuition costs, may assist families in making more thoughtful decisions about how best to prepare their children for productive and successful educational experiences.

In that same year of 2005, the National Center for Education Statistics published census reports of high school student participation in dual enrollment classes and the prevalence of post-secondary institutional involvement in providing dual enrollment programs (Kleiner & Lewis, 2005; Waits, Setzer & Lewis, 2005). The US Department of Education's most recent completed survey, the National Education Longitudinal Survey of 1988 (NELS: 88/2000), indicated that nearly twenty percent of the graduating class of 1992 had participated in credit bearing transition programs (CBTP), such as Advanced Placement, CLEP, and dual enrollment courses, and had earned college credit before entering post-secondary education (Adelman, 2004, p. 56). However, recent literature offers only a limited understanding of any impacts upon college student persistence and achievement, in the way of degree attainment, attributable to participation in CBTP courses, and in particular the influence of dual enrollment course participation upon post-secondary outcomes. Post-secondary institutions and state agencies sponsoring dual enrollment programs have conducted student and instructor surveys, and collected descriptive data regarding dual enrollment participation. Until now, these studies have been the primary sources for implementers to draw upon when considering the efficacy of dual enrollment program participation upon students' post-secondary success.

Additional research is necessary in order to fully understand the possible effects of dual enrollment program participation on student persistence in the college setting. The groundwork laid by Adelman (1999, 2004, and 2006) points to the potential for dual enrollment to complement or enhance the benefits of a rigorous high school. Further

investigations, including the “Stanford Bridge Project” (Venezia, Kirst & Antonio, 2003) signal a genuine need to guide students across the academic divide that separates high school and college experiences. However, without the use of an unbiased set of data and sophisticated statistical methods controlling for student attributes and behaviors, the likely outcomes for dual enrollment students as they enter post-secondary education have remained largely unknown.

### **Purpose**

The purpose of this current study was to investigate the impact of high school students’ participation in dual enrollment courses upon college persistence and degree attainment. The first to employ a nationally representative student population to the matter of dual enrollment programming, the analysis utilized restricted data sets and variables constructed by the NCES from the NELS: 88/2000 and the Post-secondary Education Transcript Study (PETS:2000) to parcel out students who graduated from high school in 1992 and entered post-secondary education after participating in dual enrollment programs during their high school careers. The theoretical basis for the study stemmed from Tinto’s theory of institutional departure from higher education (1993) and Merton’s theory of anticipatory socialization (1957). Not only did the study seek to learn more about dual enrollment participation’s influence upon academic integration and success in college, but also investigated possible socializing effects of participating in college equivalent courses before formal matriculation into post-secondary education, through the use of variables identifying students’ educational anticipations and persistence outcomes.

### **Research Questions**

The following four questions were developed to guide the research design and statistical methods:

- 1) Do students who have participated in dual enrollment programs have higher rates of second year college persistence than those who were not dual enrollment participants?
- 2) Do students who have participated in dual enrollment programs have shorter time to degree periods than those who are not dual enrollment participants?
- 3) Do students who have participated in dual enrollment programs experience higher levels of college degree attainment than those who are not dual enrollment participants?
- 4) Do students who have participated in dual enrollment programs experience positive affects upon college persistence and degree attainment after accounting for specific demographic attributes, when compared to those who are not dual enrollment participants after accounting for these same attributes?

### **Research Method**

In order to test possible relationships between dual enrollment program participation and students’ integration, persistence and degree attainment, a causal model

was developed. Inferential statistics, by way of logistic regression equations, were created based upon the causal model. The equations explored the total and direct effects of participation in dual enrollment courses, controlling for a set of student demographic and high school attributes upon a series of dependent variables describing post-secondary achievement. Variables from the NELS and PETS data were chosen to most closely reflect descriptors found in the causal model. Further guidance for variable selection came from Adelman's prior research on high school preparation for college success (Adelman, 1999, 2004 and 2006). Regression equations were developed in the following manner:

Step 1 – The Independent Variable (Dual Enrollment participation)

Step 2 – Demographic background

Step 3 – High School history

Step 4 – College factors

Step 5 – Post-secondary persistence and credit acquisition

Total effects models used steps 1 through 3, while direct effects models used steps 1 through 5.

Delta  $-p$  statistics created in this study described the likelihood that dual enrollment participation increases or decreases the probability of the dependent variable of each logistic regression equation as compared to students who were non-participants.

## **Major Findings**

### Persistence in Post-secondary Education

Inferential statistics suggested that dual enrollment participation may play a significant role in persistence to degree, especially for students who entered college within seven months of high school graduation, those who acquired 20 or more college credits by the end of the first year of college, and those who continued their enrollment in post-secondary education without a break of more than one semester through the second year of college.

- Dual enrollment students were 11% ( $p < .01$ ) more likely to persist through the second year of college than non-participating students.
- Dual enrollment students were 12% ( $p < .001$ ) more likely to enter college within seven months of high school graduation than non-participating students.
- Dual enrollment students who completed 20 or more credits in the first year of college were 28% ( $p < .001$ ) more likely to persist through the second year in college than were students who did not complete dual enrollment courses.

These composite persistence factors constitute “academic momentum” toward a degree. Dual enrollment participation, therefore, indicated statistically significant impacts upon students’ academic momentum. Accumulating credits in high school may have created a “nest egg” effect, thereby influencing students decisions to remain in college and creating a positive outcome for dual enrollment participants in post-secondary education. These statistics point to dual enrollment as a player in Tinto’s longitudinal model of individual departure from higher education. For dual enrollment

students, academic integration and associations with post-secondary education seem to make a positive difference in college persistence.

### Elapsed Time to Earn a Bachelor's Degree

Previous qualitative and quantitative research and informational articles on dual enrollment participation have promoted the idea that completing these types of classes could shorten the time required to complete a college degree, and therefore reduce the overall costs to families and students of post-secondary education (Bailey & Karp, 2003; Delicath, 1999; Hanson, 2005; Menzel, 2006, Porter, 2003; Windham & Perkins, 2001). The results of this study suggested that dual enrollment participation did not produce statistically greater likelihoods of earning a degree in less than 4.56 calendar years (the average time to degree standard established by Adelman in 2004). However, students who participated in dual enrollment and exhibited academic momentum demonstrated a greater likelihood of completing a degree in less than the average length of time.

- Logistic regression analysis suggested students earning at least 20 credits by the end of the freshman year improved their likelihood of earned a degree in 4.56 years by 38% ( $p < .001$ ).
- Students who remained in college without more than one semester break through the end of the sophomore year increased the likelihood of completing a degree in less than average time by 41% ( $p < .01$ ).

### Degree Attainment in Post-secondary Education

For the purposes of this study, three different types of credentialing categories were created from the NELS: 88/2000 variable HDEG (highest degree attained): Certificate or Associate of Arts Degree, Bachelor's Degree, and Graduate Hours or Advanced Degree. Students in the evaluated population were included in one of these three categories depending on their highest level of education completed by 2000. Therefore, if a student had completed both a BA and an Advanced Degree, that particular individual would be included only in the Graduate Hours/Advanced Degree category as it best described their highest level of educational attainment.

- Dual enrollment participation, apart from all other factors, reduced students' odds of achieving a bachelor's degree by 10% ( $p < .05$ ).
- Dual enrollment participating students who entered college within seven months of high school graduation improved their likelihoods of receiving a BA from between 16% and 20% ( $p < .001$ ) as compared with non-participants.
- Earning 20 credits in the freshman year and continuously enrolling to the end of the sophomore year increased the likelihood of dual enrollment students earning graduate level degrees or completing graduate level courses by 14% ( $p < .05$ ) and 34% ( $p < .001$ ) respectively, as compared to non-participants.

### Educational Expectations

The affective influence of dual enrollment participation was evaluated by the use of a variable identifying educational expectations. Three dummy variables describing levels of intentions were created: those students who consistently expected to earn a BA (the reference category); those students whose expectations rose to a BA; and those students whose expectations were for a credential less than a BA.

- Inferential statistics indicated a 12% ( $p < .01$ ) greater likelihood that dual enrollment students who had not anticipated earning a BA would graduate with a bachelor's degree than non-participating students who had originally intended to earn a BA.

These results may point to the socializing effect of participation in dual enrollment programs, as described by Merton (1957) in his theory of anticipatory socialization.

### Statistical Controls

Prior research on dual enrollment had produced very few studies employing regression analysis of any kind (Eimers & Mullen, 2003), with most studies utilizing descriptive data or Chi-Square as the statistical method (Porter, 2003; Menzel, 2006). In this study, dual enrollment, functioning as the main independent variable in the logistic regression equations, produced statistically significant effects while controlling for a series of confounding variables selected from the NELS: 88/2000 and PETS data. Amongst the demographic and high school control variables used in this research were: gender, racial group, first generation student and socioeconomic status, and high school academic record – including class rank, GPA, standardized test scores and level of rigor in the curriculum completed.

## **Implications of the Research Results**

### Demographic Considerations

Generally, demographic descriptors of dual enrollment students yielded very little in the way of statistically significant results. Specifically, males and Hispanic dual enrollment students showed a decreased likelihood of achieving post-secondary success as compared to white and female participants. These demographic statistics suggesting negative impacts on males and Hispanics enrolled in dual credit programs are concerning, especially with the dwindling numbers of males on college campuses and increasing numbers of Hispanic youth enter the K-12 school systems and large percentages fail to graduate from high school. On the other hand, dual enrollment does not seem to favor one demographic group over another and produced inconsistent results in regards to prerequisite high school qualifications.

One of the major limitations of this study lies in the age of the data and the changes in demographics in the US student population since 1992. Over 813,000 students participated in dual enrollment programs in 2002-2003 school year (Kleiner & Lewis, 2005, p. 7). In 1992, a weighted sample of 213,000 dual enrollment students were

identified through the NELS: 88/2000 data set (Adelman, 2006, p.99). Repeating this study with newer data may not be possible for some time, as the Education Longitudinal Study: 2002 (ELS) data will not be complete for several years. Uncertainty exists as to whether an in-depth transcript study, such as that performed for the NELS: 88/2000, will be undertaken in order to parcel out dual enrollment participation from the total population surveyed. New longitudinal data regarding college enrollments is currently being collected by a number of state governmental bodies through P-16 initiatives (Achieve, Inc., 2008). However, inconsistencies between these data sources may render them useless in the context of a national study.

### Academic Momentum and Degree Attainment

Students who participated in dual enrollment classes were more likely to enroll in post-secondary education directly after high school than were non-participants. In this research, the variable, NODELAY, was an even stronger predictor of post-secondary success for dual enrollment participants than found in prior studies (Adelman, 1999 and 2006). Entering post-secondary education immediately after high school pointed to a statistically significant positive increase in the likelihood of degree attainment for dual enrollment students as compared to non-participants.

Dual enrollment students, by nature of their participation, earn college credits before post-secondary matriculation. Therefore, at least a portion of the first year transcript includes credits earned while still a high school student. The variable, CREDMOM, used to describe freshman year college credit attainment, was a strong predictor of earning a bachelor's degree within the 4.56 years or less average time utilized for this study. Additionally, earning 20 or more credits by the end of the first year played a significant part in dual enrollment students' attainment of a bachelor's degree. Therefore, earning credits in high school may help students to build academic momentum, a benefit which may assist students not only to graduate with a degree, but also may diminish the time necessary to complete degree programs.

Entering college shortly after completing high school and earning a portion of their first year credits through dual enrollment programs suggests a recipe for success in attaining bachelor's degrees and graduate credit level work. The nest egg effect of beginning college with academic credit points to the possibility of strong post-secondary advantages gained through the experience of undertaking dual enrollment classes.

Furthermore, results for dual enrollment students who continued on with their studies at least to the end of the sophomore year in college, signified by the variable NOSTOP, suggest the greatest statistically significant predictor for bachelor's degree and graduate school degree attainment in this study. Continuing on in school will not guarantee completion of a degree, but without the habit of continuing in school a degree is unlikely. Dual enrollment participant's momentum toward a degree suggests an increasing likelihood of the completion of bachelor's and graduate level degrees.

Participating in a credit-based transition program, such as dual enrollment, may have created the circumstances by which students are reluctant to give up the credits earned in high school. These students are perhaps more likely to experience a sense of achievement in their initial college credit classes, and therefore enter post-secondary education without delay after high school to a greater degree than non-participants. Dual

enrollment participants seem to demonstrate a greater likelihood to continue on with their post-secondary studies after the experience of college classes in the high school. The combination of these three variables marking persistence in college (NODELAY, CUMCRED, and NOSTOP) when combined with dual enrollment experiences produced statistically significant effects on degree attainment, whereas the singular effect of dual enrollment participation failed to produce significant results on time to degree or on degree attainment of any type.

### Sociological Impacts

The affective influence of dual enrollment participation suggests that, at least in the case of students who entered programs without the intent to earn a bachelor's degree, statistically significant modifications of educational expectations may occur. The statistical results of this study support the conclusion that dual enrollment course participation may impact the anticipatory socialization patterns of students, especially in regards to anticipating oneself in the role of college student. Acquiring or assimilating habits typical of college attitudes, norms and expectations may have played a role in impacting students' changing aspirations toward degree attainment, as compared to students who already expected to earn a bachelor's degree. The results of this study suggest that dual enrollment participation likely played a role in changing students' attitudes toward bachelor's degree attainment. Positive experiences in a dual enrollment classes may, therefore, impact a change in attitude and reinforce retention rather than departure from college, as noted in Tinto's model of student departure (1993). Not only does dual enrollment participation provide a positive statistical likelihood of persistence, the act of participation in high school may influence students' beliefs about themselves as future college graduates. Above all else, this may prove the most important reason for students to participate in dual enrollment courses.

### **Conclusions**

According to the WICHE (2006) report, 42 of 50 states have adopted policies, rules and regulations regarding the implementation and oversight of dual enrollment programs. Therefore, states have been and are continuing to invest in this acceleration strategy, often counting average daily attendance of dual enrollment students in both the K-12 high school and college census. In some areas of the US, students sign up for this first taste of college by way of enticing tuition breaks and scholarships to transferring students (Boswell, 2001). Measuring student outcomes from these programs has largely been left to the institutions sponsoring courses or to a few state governing bodies that have developed a means to collect cohort or longitudinal data. Heretofore, uncertainty regarding the efficacy of dual enrollment programming revolved around the proverbial question, "Does it make any difference?"

Overall, I believe the most important findings of this report are the suggestions that dual enrollment fosters more positive attitudes towards earning post-secondary degrees in students who did not previously hold these attitudes; that dual enrollment participation greatly improves students' propensity to persist in college; and this persistence in turn improved greatly dual enrollment students' likelihood and odds to

graduate from college with bachelor's or graduate level degrees. Alone, as a single indicator dual enrollment participation did not improve the odds that students will graduate early from college, nor did it improve their likelihood to earn a degree as compared to non-participants. However, taking into account the idea that dual enrollment promotes immediate entry and persistence, these factors greatly improved the students' chances at acquiring post-secondary credentials as compared to non-participants.

The implications of this study's results are clear – dual enrollment should be considered as a viable means to improve students' likelihoods of entering post-secondary education, of continuing in college, and of acquiring degrees. State legislatures and the federal government should modify current legislation to include dual enrollment as a means, on par with other credit based transition programs like Advanced Placement, to improve both the rigor of the high school curriculum and students' preparation for college. More importantly, dual enrollment experiences can serve as a psychological and academic bridge between secondary and post-secondary schooling. Dual enrollment programs should be more widely available to all students and preparation for taking part in these classes should begin for the majority of students in the middle school years.

Citation:

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