

Postsecondary Enrollment: Summary of Phase I

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TABLE OF CONTENTS

LIST OF TABLES	3
LIST OF FIGURES	4
INTRODUCTION	5
SUMMARY OF STUDY METHODOLOGY	5
FINDINGS	7
<i>Definitions of college enrollment</i>	7
<i>Factors</i>	
<i>Student attendance and college enrollment</i>	9
<i>Disabilities and college enrollment</i>	10
<i>Dual enrollment and college enrollment</i>	13
<i>Advanced placement and college enrollment</i>	16
<i>Educational aspiration or expectation, academic goals, and college enrollment</i>	17
<i>Distance education and college enrollment</i>	19
<i>Gender and college enrollment</i>	20
<i>The effects of socio-economic status on college enrollment</i>	22
<i>Race and college enrollment</i>	25
<i>School-level effects on college enrollment</i>	
<i>Curriculum rigor</i>	28
<i>Virginia Standards of Learning and College Enrollment</i>	31
RECOMMENDATIONS FOR FURTHER INVESTIGATION	41
REFERENCES	42
APPENDIX	48

LIST OF TABLES

Table No.	Title	Page
Table 1:	<i>Post-Secondary Enrollment by Cohort</i>	08
Table 2:	<i>Highest Post-Secondary Enrollment by Cohort</i>	09
Table 3:	<i>Post-Secondary Enrollment and Percent of Available Days Enrolled Correlated</i>	10
Table 4:	<i>Post-Secondary Enrollment and Disability Status Correlated</i>	12
Table 5:	<i>Primary Disability Code by Enrollment Type</i>	13
Table 6:	<i>Dual Enrollment and Postsecondary Enrollment</i>	14
Table 7:	<i>CTE Finisher Code and Postsecondary Enrollment</i>	15
Table 8:	<i>Advanced Placement Code and Postsecondary Enrollment</i>	17
Table 9:	<i>Graduate Plan and Postsecondary Enrollment</i>	19
Table 10:	<i>Distance Education Status and Postsecondary Enrollment</i>	20
Table 11:	<i>Gender and Postsecondary Enrollment</i>	21
Table 12:	<i>Disadvantaged Student Status and Postsecondary Enrollment</i>	23
Table 13:	<i>Gender and Disadvantaged Student Status Interaction and Postsecondary Enrollment</i>	25
Table 14:	<i>Gender and Disadvantaged Student Status and Race Interaction and Postsecondary Enrollment</i>	28
Table 15:	<i>High School Degree Type and Postsecondary Enrollment Rates</i>	30
Table 16:	<i>Enrollment-SOL Scaled Scores Comparison: Highest Post-Secondary Enrollment 2006 Cohort</i>	33
Table 17:	<i>Enrollment-SOL Scaled Scores Comparison: Highest Post-Secondary Enrollment 2007 Cohort</i>	33
Table 18:	<i>Virginia SOL Proficiency Levels and Four-Year Enrollment Rates (2006)</i>	36
Table 19:	<i>Virginia SOL Proficiency Levels and Four-Year Enrollment Rates (2007)</i>	36
Table 20:	<i>Virginia SOL Proficiency Levels and Two-Year Enrollment Rates (2006)</i>	38
Table 21:	<i>Virginia SOL Proficiency Levels and Two-Year Enrollment Rates (2007)</i>	38
Table 22:	<i>Correlations of Virginia Standard of Learning Scaled Scores with Post-Secondary Enrollment (2006)</i>	40
Table 23:	<i>Correlations of Virginia Standard of Learning Scaled Scores with Post-Secondary Enrollment (2007)</i>	40
Table 24:	<i>Correlations of Virginia Standard of Learning Scaled Scores with Post-Secondary Enrollment</i>	41
Table 25:	<i>Race and Postsecondary Enrollment</i>	48
Table 26:	<i>CTE Completion Status, Dual Enrollment Status, and Postsecondary Enrollment</i>	48
Table 27:	<i>Classification of observed correlations by Lotkowski, Robbins, and Noeth (2004)</i>	49
Table 28:	<i>Distribution of correlation magnitudes from empirical studies by Hemphill (2003)</i>	49

LIST OF FIGURES

Figure No.	Title	Page
Figure 1:	<i>Enrollment Rates for Individuals with Disabilities</i>	11
Figure 2:	<i>CTE Completion Status, Dual Enrollment Status, and Postsecondary Enrollment</i>	16
Figure 3:	<i>Various Enrollment Rates and the Interaction of Gender and Economically Disadvantaged Student Status</i>	24
Figure 4:	<i>Four-year and Two-year Enrollment Rates by Race</i>	26
Figure 5:	<i>High School Degree Type and Postsecondary Enrollment Rates</i>	31

Postsecondary Enrollment: Summary of Phase I

Introduction

In 2009, the Virginia Department of Education contracted Virginia Tech's Center for Assessment, Evaluation, and Educational Programming to descriptively explore the relationship between various student characteristics, Virginia Standards of Learning scaled scores and proficiency levels, and post-secondary enrollment outcomes, namely enrollment rates at four-year and two-year institutions. Data for the high school graduating class of 2006 (2006 Cohort) and 2007 (2007 Cohort) were used in the analysis.

This research project had two objectives. One goal of the project was to develop the background knowledge that would allow the current researchers to develop additional and more sophisticated measures not only related to various measures of enrollment, but also persistence. Another goal of the project was to provide the Virginia Department of Education with information that could be used to identify future lines of research and inquiry.

This current document is a summary offering highlights, key findings, and areas for further investigation. The factors of interest are based on the following variables available in the Virginia Department of Education (VDOE) database: days present/days absent, disability, dual enrollment, A.P. Code, grad plan, distance learning, gender, disadvantaged, race, and diploma type and enrollment data provided by the National Student Clearinghouse.

Summary of Study Methodology

A relational database was created using Filemaker Pro 9 Advanced since there was a potential for numerous postsecondary enrollment records per student/case. After aggregate measures of postsecondary enrollment were developed within the database, a flat file was

created for use in SPSS 17.0 and descriptive and inferential statistics were calculated. Research staff first conducted a data audit and worked with VDOE to insure the analytic data set contained accurate and all of the necessary data for analyses.

For the descriptive analysis, each of the categorical variables, such as gender and disadvantaged student status, were cross-tabulated with the following measures of post-secondary enrollment: whether the student enrolled at any postsecondary institution following graduation, whether the student enrolled at a four-year institution, whether the student enrolled at a two-year institution, whether the student enrolled at a less than two-year institution, and their highest enrollment. In addition, means comparisons were calculated for the scaled variables, such as the SOL scaled scores and the percent of days enrolled present.

The researchers have provided the complete set of descriptive tables with the information layered by graduating cohort in separate supporting documents for ease of reference (see supporting document B, C, and D).

An annotated bibliography focusing on measures of postsecondary enrollment and the factors or variables related to it was also developed (see supporting document E). A summary of relevant literature regarding the factors/variables pertaining to postsecondary enrollment was created using the resources identified in the annotated bibliography (see supporting document F). The primary sources of information used for this literature summary are published reports, peer reviewed journal articles, and conference papers published since 2000. The main search engines used for the review were ERIC and Google Scholar. The key words used for the database searches included “college or university enrollment” and those concepts related to variables available through the VDOE database such as race, disability, and

enrollment in advanced placement (AP) classes. The current document includes select portions of the summary of the literature focusing on the same factors available to the researchers in the current project.

Findings

Definitions of college enrollment

The most salient definition of college enrollment found in the literature is simply whether a student matriculates in a college or university degree program. This is the predominant definition found in the literature (Ahlburg, McPherson, & Schapiro, 1994; Akerhielm, Berger, Hooker & Wise, 1998; Engberg & Wolniak, 2009; Goenner & Pauls, 2004; Perna & Titus, 2004; Wolniak & Engberg, 2007). A similar approach is employed in the current study, but the current researchers distinguish between enrollment at four-year, two-year, and less than two year institutions.

Three studies offer more faceted definitions of enrollment. Plank and Jordan (2001) considered four enrollment categories: 1) full time enrollment at a four-year institution 2) full time enrollment at a two-year institution, 3) part time enrollment at a two-year institution and 4) never enrolled. Rowan-Kenyon (2007) looked at the timing of enrollment and used the following categories: 1) immediate enrollment 2) delayed enrollment and 3) no enrollment. The current researchers are planning on using similar definitions in Phase II of the enrollment study.

Table 1 depicts the four-year, two-year, less than two-year, and overall post-secondary enrollment rates for members of both the 2006 and 2007 graduating cohorts and the two cohorts combined. Due to having an additional year to enroll, the 2006 cohort had a slightly higher percentage of cohort members meeting each of the measures. Only a limited number

(less than one percent) of study group members enroll at less than two-year institutions, as nearly all enrollment is a result of enrollment at two-year and four-year institutions. It should be noted that the measures presented on Table 1 are not mutually exclusive and an individual could enroll at all three types of post-secondary institutions. Within three academic years of high school graduation--AY 06-07, AY 07-08, and AY 08-09--44.4% of the 2006 Cohort had enrolled at a four-year institution for at least one semester and within two academic years--AY 07-08 and AY 08-09--41.5% of the 2007 Cohort had met the same enrollment measure. Additionally, in terms of two-year enrollment during the same time frame, 36.1% of the 2006 Cohort and 32.7% of the 2007 Cohort had enrolled at a two-year institution for at least one semester. In contrasting the enrollment rates of the two cohorts, the difference in the overall enrollment rate was somewhat smaller (1.5%) than the difference in the four-year (2.9%) and two-year (3.4%) enrollment rates. Clearly, the 2006 cohort had a higher percentage of its members achieve the enrollment outcomes, likely due to having additional time to enroll.

Table 1:
Post-Secondary Enrollment by Cohort

Enrollment Measure	Four-Year	Two-Year	Less than Two-Year	Overall
2006 Cohort	44.4%	36.1%	0.6%	69.0%
2007 Cohort	41.5%	32.7%	0.4%	67.5%
<i>Total</i>	<i>42.9%</i>	<i>34.4%</i>	<i>0.3%</i>	<i>68.3%</i>

Table 2 displays the highest postsecondary enrollment based on the following descending order: four-year, two-year, less than two-year, and not enrolled. Therefore, if someone enrolled at both a two-year institution and a four-year institution, the individual's highest enrollment would be four-year and this is true regardless of the sequence of the enrollments. Obviously, the percent within each cohort within the four-year category was the

same as that listed in Table 1 since it was considered the highest enrollment type; however, the difference between the percent with two-year enrollment as the highest (Table 2) and the percent enrolling at two-year institutions for at least one semester (Table 1) suggests movement or overlap in enrollment between two-year and four-year institutions. However, it should be noted that the sequence of the enrollment will be explored in Phase II of the current study when persistence is examined.

Table 2:
Highest Post-Secondary Enrollment by Cohort

Enrollment Measure	Four-Year	Two-Year	Less than Two-Year	Not Enrolled
2006 Cohort	44.4%	24.3%	0.3%	31.0%
2007 Cohort	41.5%	25.7%	0.3%	32.5%
<i>Total</i>	<i>42.9%</i>	<i>25.0%</i>	<i>0.3%</i>	<i>31.7%</i>

Factors

Student attendance and college enrollment

None of the predictive models of college enrollment found for this review included secondary school attendance as a variable in the model. However, a few studies have examined the effect of attendance on higher education outcomes. For example, a British Study noted that truancy, or absences that are unexcused, is negatively associated with pursuing higher education (Attwood & Croll, 2006). Furthermore, Strickland (1998) found that attendance is positively correlated with high school grade point average. High school grade point average, in turn, has been shown to be a significant predictor of college enrollment (Cho, 2007; Goldrick-Rab, 2006; Horn and Nunez, 2000; Johnson, 2008). Clement (2006) suggests that researchers distinguish between excused and unexcused absences when examining the effects of attendance.

Based on Hemphill’s (2003) review on correlation coefficient magnitude interpretations, the correlations below can be summarized as follows (see appendix). There was a moderately strong positive correlation in relative terms between the percent of days present and overall postsecondary enrollment (.222) , and four-year enrollment (.237); however, there was virtually no relationship between the percent of days present and two-year (.003) and less than two-year enrollment (-.021). As shown on Table 3, the strength and direction of the Pearson correlations were quite similar for the two separate cohorts; however the 2006 cohort had a slightly stronger correlation between the percent present and four-year enrollment and the 2007 cohort had a slightly stronger correlation between the percent present and overall enrollment. Due to limitations of the current data set there was no way to distinguish between excused and unexcused absences as suggested by Clement (2006).

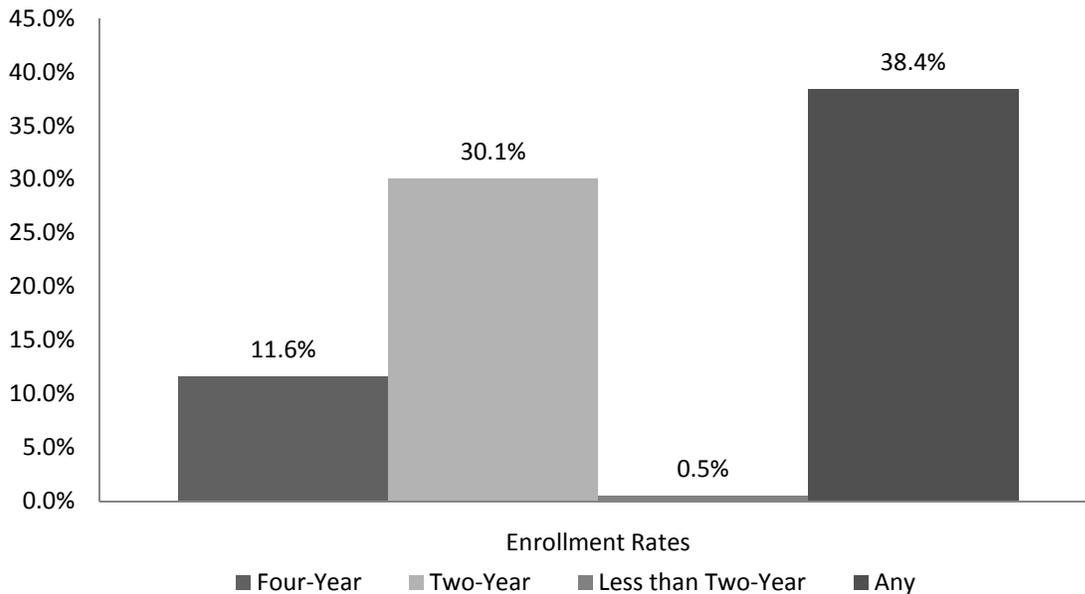
Table 3:
Post-Secondary Enrollment and Percent of Available Days Enrolled Correlated

Cohort	Four-year	Two-Year	Less than Two-Year	Overall
2006	.242	.002	-.023	.218
2007	.233	.004	-.018	.225
<i>Total</i>	<i>.237</i>	<i>.003</i>	<i>-.021</i>	<i>.222</i>

Disabilities and college enrollment

As shown on Figure 1, a little less than 12% of those with identified disabilities enrolled at four-year institutions, roughly 30% enrolled at a two-year institution for at least one semester, and one-half of one-percent enrolled at less than two-year institutions. Overall, 38.4% of the students with identified disabilities from the 2006 and 2007 cohorts enrolled at a post-secondary institution before the end of the study.

Figure 1:
Enrollment Rates for Individuals with Disabilities



No studies were found that examined the relationship between disability status and college enrollment; however the current findings suggest that having a disability is related to a decreased likelihood of postsecondary enrollment. Based on Hemphill’s (2003) review on correlation coefficient magnitude interpretations, the correlations below can be summarized as follows (see appendix). In total, there was a small to moderate negative correlation (Spearman's rho) in relative terms between having a disability (measured as having an identified disability yes/no) and overall enrollment (-.238), and four year enrollment (-.235); however, the correlation between having a disability and two-year (-.033) and less than two-year (.004) enrollment was weak and almost non-existent. The direction and strength of the correlations was consistent across the two cohorts, as only minimal differences existed (see Table 4).

Table 4:
Post-Secondary Enrollment and Disability Status Correlated

Cohort	n (%) with Disability	Four-year	Two-Year	Less than Two-Year	Overall
2006	9,973 (12.1%)	-.237	-.036	.005	-.236
2007	9,354 (12.1%)	-.233	-.031	.002	-.240
<i>Total</i>	<i>19,327 (12.1%)</i>	<i>-.235</i>	<i>-.033</i>	<i>.004</i>	<i>-.238</i>

When the enrollment rates of the various disability sub-groups were examined separately via cross-tabulations, differences between the sub-groups became evident (see Table 5). Generally speaking, a higher percentage of enrollments for those with disabilities occurred at two-year institutions, with one exception. For the individuals classified under section 504 of the Rehabilitation Act, the percentage enrolling at two-year and four-year institutions was the same, 43.1%, and they actually had a slightly higher overall enrollment rate (73.9%) than those with no identified disability (72.4%). Several of the disability sub-groups had less than a 10% four-year enrollment rate; however only two sub-groups had less than a 10% two-year enrollment rate. Overall, the four primary disability sub-groups with the highest percentage of group members enrolling at postsecondary institutions were those classified under Section 504 of the Rehabilitation Act (73.9%), those with orthopedic impairments (61.5%), those with visual impairments (59.7%) and those with speech or language disabilities (58.7%). The same four sub-groups also had the highest percentage enrolling at four-year institutions, but in a slightly different order. The Section 504 (43.1%), deaf-blindness (42.0%), and orthopedic impairment (40.6%) disability subgroups had the highest two-year enrollment rates. The severe disability, mental retardation, developmental delay, and multiple disability sub-groups had the lowest overall and two-year enrollment rates. It should be noted that the information presented on Table 5 was combined across the 2006 and 2007 cohorts.

Table 5:
Primary Disability Code by Enrollment Type

Primary Disability Code	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
No Disability	139,095	47.3%	34.9%	0.5%	72.4%
Mental Retardation	2,154	1.1%	7.3%	0.4%	8.4%
Severe Disability	105	1.9%	0.0%	0.0%	1.9%
Multiple Disabilities	366	2.5%	15.6%	0.3%	17.5%
Orthopedic Impairment	96	30.2%	40.6%	0.0%	61.5%
Visual Impairment	62	27.4%	35.5%	1.6%	59.7%
Hearing Impairment	188	22.9%	28.7%	0.5%	46.8%
Specific Learning Disability	10,436	13.5%	34.2%	0.7%	43.9%
Emotional Disturbance	1,958	8.3%	29.2%	0.6%	34.8%
Speech or Language	286	30.8%	35.3%	0.3%	58.7%
Other Health Impairment	3,173	13.1%	34.8%	0.3%	43.6%
Deaf-Blindness	119	5.0%	42.0%	0.0%	45.4%
Autism	303	9.9%	25.1%	0.0%	32.7%
Traumatic Brain Injury	68	5.9%	22.1%	1.5%	27.9%
Section 504	1,171	43.1%	43.1%	0.3%	73.9%
Developmental Delay	13	0.0%	15.4%	0.0%	15.4%

Dual enrollment and college enrollment

Two studies point to the positive effects of dual enrollment programs on college enrollment. For example, Karp and Hughes (2008) found that career and technical education (CTE) students enrolled in dual enrollment programs were 1% more likely to enroll in college than their counterparts not enrolled in dual enrollment programs. Of those enrolled in college, CTE students who participated in a dual enrollment program in high school were more likely to be enrolled full time. Reese (2008) found that 96% percent of students participating in a dual enrollment program in Texas continued their education at community colleges or at four-year institutions.

The Kentucky Council on Postsecondary Education (2006) wrote that the type of dual enrollment coursework makes a difference in predicting college enrollment. Specifically, students who took academic courses in the dual enrollment program enrolled in college at a

slightly higher rate than the overall high school population. Students who took CTE courses enrolled in college at lower rates than the overall high school population.

Cross-tabulations (see Table 6) revealed that the overall enrollment rate and four-year enrollment rate for dually-enrolled students were higher than those of high school graduates not dually-enrolled; however, only slight differences existed between the two groups in two-year enrollment rates; the dually enrolled subgroup had slightly higher two-year enrollment rates. Once again, only slight differences existed between the cohorts regarding this particular variable as those from the 2006 Cohort had slightly higher enrollment rates in all four postsecondary outcome measures for both dually-enrolled and not dually-enrolled students. Without controlling for other differences that may exist, being dually-enrolled appeared to be related to an increased probability of enrolling at a four-year institution, which accounted for most of the difference in the overall enrollment rates.

Table 6:
Dual Enrollment and Postsecondary Enrollment

Cohort	Dual Enrollment Status	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
2006	Dually-Enrolled	10,579	65.5%	37.7%	0.6%	85.7%
	Not Dually-Enrolled	64,435	42.3%	35.8%	0.6%	67.3%
2007	Dually-Enrolled	12,024	60.1%	33.2%	0.2%	82.9%
	Not Dually-Enrolled	67,669	39.9%	32.6%	0.4%	65.8%
Total	<i>Dually-Enrolled</i>	<i>22,603</i>	<i>62.7%</i>	<i>35.3%</i>	<i>0.4%</i>	<i>84.2%</i>
	<i>Not Dually-Enrolled</i>	<i>132,104</i>	<i>40.8%</i>	<i>34.1%</i>	<i>0.5%</i>	<i>66.1%</i>

Table 7 shows enrollment rates for students who participated in CTE programs based on information provided by the Virginia Department of Education. It should be noted that CTE Completers are required to have successfully finished an approved sequence of CTE courses, Tech Prep completers are required to have successfully finished an approved sequence of CTE

courses coordinated with a community college, and CTE participants are those who take only one CTE course. As shown on Table 7, those who did not participate in CTE courses had higher overall enrollment rates and higher four-year enrollment rates relative to the other three groups that have participated in a CTE program. The table also shows that students who participated in CTE programs had higher two-year enrollment rates than non-CTE students. However, this is at least in part attributable to more non-CTE students attending four-year institutions.

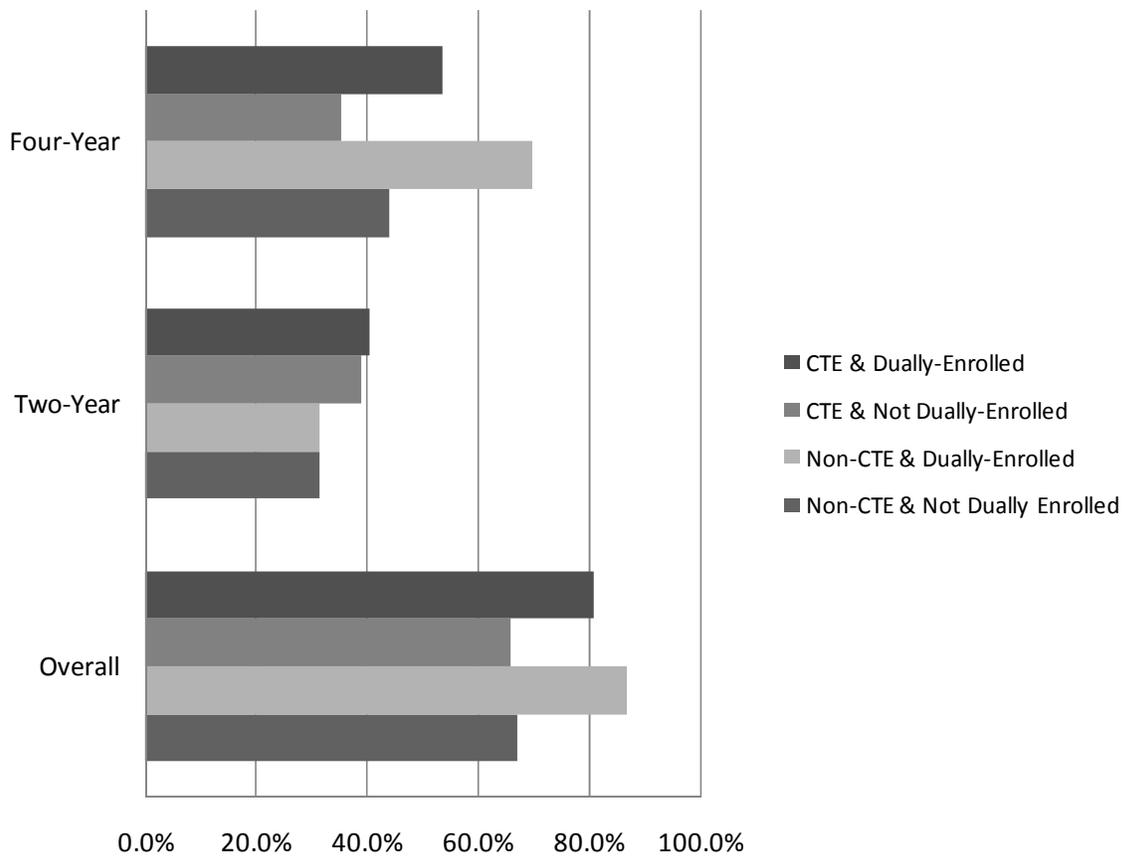
Table 7:
CTE Finisher Code and Postsecondary Enrollment

Cohort	CTE Finisher Code	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
2006	CTE Completer	16,556	38.9%	38.7%	0.6%	66.3%
	Tech Prep	12,796	41.6%	42.6%	0.6%	71.5%
	CTE Participant	35,325	42.7%	35.6%	0.6%	67.2%
	No CTE	12,671	59.5%	27.5%	0.4%	75.6%
2007	CTE Completer	19,765	35.1%	36.0%	0.5%	64.9%
	Tech Prep	11,267	37.2%	40.6%	0.2%	70.2%
	CTE Participant	38,674	42.2%	31.6%	0.4%	67.0%
	No CTE	12,416	53.4%	24.0%	0.3%	70.8%
Total	CTE Completer	36,321	36.8%	37.2%	0.6%	65.6%
	Tech Prep	24,063	39.6%	41.7%	0.4%	70.9%
	CTE Participant	73,999	42.4%	33.5%	0.5%	67.1%
	No CTE	25,087	56.4%	25.8%	0.3%	73.2%

The interaction of completing a CTE program and dual enrollment status upon postsecondary enrollment is depicted on Figure 2. In total, the two dually-enrolled groups (Non-CTE & Dually Enrolled and CTE & Dually Enrolled) had the highest overall and four-year enrollment rates, and the two CTE groups (CTE & Dually Enrolled and CTE & Not-Dually Enrolled) had the highest two-year enrollment rates. In comparing the two groups that were not dually-enrolled, the overall enrollment rates were quite similar (an absolute difference of 1.3%); however, the Non-CTE & dually-enrolled group had a higher four-year enrollment rate

and the CTE & Not Dually Enrolled group had a higher two-year enrollment rate. A comparison of the two dually-enrolled groups revealed a difference in the overall enrollment rate of six percent in favor of the non-CTE group, a difference in the four-year enrollment rate of 15.8% in favor of the non-CTE group, and a difference in the two-year enrollment rates of 9.2% in favor of the CTE group.

Figure 2:
CTE Completion Status, Dual Enrollment Status, and Postsecondary Enrollment



Advanced placement and college enrollment

No studies were found that examined the role of advanced placement on college enrollment. However, Dougherty, Mellor, and Jian (2006) gave some guidance on how to study the effect of advanced placement programs on higher education student outcomes. In their

study, they found that school pass rates on the AP exams are a better indicator of whether or not a school is preparing students to succeed in college than AP course participation.

The findings of the current study suggested taking the AP exam is related to an increased probability of enrolling at a four-year institution. Table 8 depicts the enrollment rates for those falling within the various advanced placement categories. The two subgroups that took the AP exam (Enrolled and Took AP Exam and Took AP Exam) had the highest rate of enrollment at four-year institutions. Those with no record of AP exposure had the lowest enrollment rate at four-year institutions, but the highest enrollment rate at two-year institutions. Interestingly, the Enrolled in AP and Took the AP Exam subgroups from the 2007 Cohort had slightly higher two-year enrollment rates compared to their counterparts in the 2006 Cohort, despite having one less year to meet the enrollment measure.

Table 8:
Advanced Placement Code and Postsecondary Enrollment

Cohort	Advanced Placement Code	n	Four-year	Two-Year	Less than Two-Year	Overall
2006	No AP Exposure	54,721	28.8%	40.7%	0.7%	59.9%
	Enrolled in AP	5,621	74.8%	33.0%	0.3%	89.5%
	Enrolled and Took AP Exam	16,436	84.1%	22.7%	0.1%	91.5%
	Took AP Exam	680	89.0%	14.0%	0.1%	92.1%
2007	No AP Exposure	57,415	25.5%	37.6%	0.5%	57.7%
	Enrolled in AP	4,042	63.9%	34.2%	0.3%	86.3%
	Enrolled and Took AP Exam	20,260	81.6%	18.9%	0.0%	91.1%
	Took AP Exam	418	78.5%	21.8%	0.2%	91.1%
Total	<i>No AP Exposure</i>	<i>112,136</i>	<i>27.1%</i>	<i>39.1%</i>	<i>0.6%</i>	<i>58.8%</i>
	<i>Enrolled in AP</i>	<i>9,663</i>	<i>70.2%</i>	<i>33.5%</i>	<i>0.3%</i>	<i>82.2%</i>
	<i>Enrolled and Took AP Exam</i>	<i>36,696</i>	<i>82.8%</i>	<i>20.6%</i>	<i>0.1%</i>	<i>88.2%</i>
	<i>Took AP Exam</i>	<i>1,098</i>	<i>85.0%</i>	<i>16.9%</i>	<i>0.2%</i>	<i>91.7%</i>

Educational aspiration or expectation, academic goals, and college enrollment

Obidah, Christie, and McDonough (2004) stated that education aspiration plays a crucial role in college enrollment. Akerhielm, Berger, Hooker, and Wise (1998), Beattie (2002), and Bennett and Xie (2000) each found that students with high educational expectations were more

likely to enroll in college. In each of these findings, the effects of educational aspiration remained significant after accounting for other effects on college enrollment. In predicting enrollment patterns, Goldrick-Rab (2006) found that “students who anticipated as high school seniors that they would earn a college degree were more likely to remain continuously enrolled in one or more institutions” than those who did not have this anticipation (p. 69). Finally, educational aspirations vary by first generation status, or whether the student had parents who did not go to college. In general, educational aspirations are lower among first generation college students (Choy, 2001; Engle, 2007).

Generally speaking, those with the listed goal of enrolling at a four-year institution, had higher overall and four-year enrollment rates. As demonstrated on Table 9, more than three-quarters of those planning on enrolling at a four-year college achieved the goal and a little less than 90% enrolled at postsecondary institutions overall, instead enrolling at two-year or less than two-year institutions. This finding was similar to those of Obidah, Christie, and McDonoug (2004) Akerhielm, Berger, Hooker, and Wise (1998), Beattie (2002), and Bennett and Xie (2000); however, the current researchers did not isolate the effects of education aspiration on enrollment and instead explored the relationship descriptively. Regarding those planning on enrolling at a two-year college, 62.6% achieved the goal and a little more than two-thirds enrolled at postsecondary institutions overall, instead enrolling at 4-year or less than two-year institutions. Correlations (Spearman's rho) revealed an extremely strong relationship (.73) between the 4-year college graduate plan and actual four-year enrollment and a strong (.36) relationship between the 2-year graduate plan and actual two-year enrollment (see appendix regarding the interpretation of correlation coefficients).

Table 9:
Graduate Plan and Postsecondary Enrollment

Cohort	Graduate Plan	n	Actual Enrollment Documented Through the National Student Clearinghouse			
			Four-year	Two-Year	Less than Two-Year	Overall
2006	4-year College	37,764	78.9%	27.6%	0.2%	89.3%
	2-Year College	19,672	14.3%	63.8%	1.0%	68.4%
	Other	3,959	7.3%	29.5%	1.0%	34.9%
	Military	2,206	8.4%	22.4%	0.6%	28.6%
	Job	9,339	5.9%	21.7%	0.9%	26.1%
	None	4,518	16.6%	28.8%	0.8%	40.8%
2007	4-year College	40,450	77.7%	22.3%	0.1%	88.4%
	2-Year College	22,549	7.1%	61.5%	0.6%	65.3%
	Other	3,601	6.5%	26.1%	1.1%	32.1%
	Military	2,144	6.5%	17.6%	0.2%	22.9%
	Job	9,610	3.2%	17.8%	0.7%	20.8%
	None	3,781	9.8%	25.9%	0.7%	34.0%
Total	4-year College	78,214	78.3%	24.8%	0.1%	88.9%
	2-Year College	42,221	10.5%	62.6%	0.8%	66.8%
	Other	7,560	6.9%	27.9%	1.0%	33.6%
	Military	4,350	7.5%	20.1%	0.4%	25.8%
	Job	18,949	4.5%	19.7%	0.8%	23.4%
	None	8,299	13.5%	27.5%	0.8%	37.7%

Distance education and college enrollment

No studies were found that examined the effect of distance education in high school on college enrollment. However, one meta-analysis by Cavanaugh (2001) showed that interactive distance education programs using videoconferencing or telecommunications have a small, positive effect on student achievement in high school, which in turn affects the probability of enrolling in college (Cho, 2007; Goldrick-Rab, 2006; Horn and Nunez, 2000; Johnson, 2008). Other studies of distance education report no significant effects on student achievement in high school (Barbour & Mulcahy, 2006; Cavanaugh et al., 2004).

A distance learning marker was used in the current study and revealed that those with exposure to distance learning had higher rates of overall and four-year enrollment; however

the difference between those with distance learning exposure and those without such exposure in terms of two-year enrollment was minimal. Distance learning was somewhat unique in that those in the 2007 Cohort had higher overall enrollment and four-year enrollment rates than those in the 2006 cohort, despite having one less year to meet those measures. This could be because of the large increase in the number of study group members identified as having participated in distance learning; those with a positive indicator in the distance learning field increased substantially going from 2006 to 2007 (1,386 to 2,358). It should be noted that there is a relatively small number of students who participate in distance learning and perhaps they have unique characteristics that are related to a greater likelihood of four-year enrollment.

Table 10:
Distance Education Status and Postsecondary Enrollment

Cohort	Distance Learning	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
2006	Yes	1,386	55.7%	37.1%	0.4%	77.9%
	No	72,570	45.5%	35.9%	0.6%	69.8%
2007	Yes	2,358	57.7%	34.3%	0.4%	82.2%
	No	77,334	42.1%	32.6%	0.4%	67.9%
Total	Yes	3,744	57.0%	35.3%	0.4%	80.6%
	No	149,904	43.7%	34.2%	0.5%	66.8%

Gender and college enrollment

Several recent studies have shown that the gender gap in college enrollment now favors women over men (Ahlburg, McPherson, and Shapiro, 1994; Bennett and Xie, 2000; Buchmann & DiPrete, 2006; Buchmann, DiPrete, & McDaniel, 2008; Cho, 2007; Goldin, Katz, Kuziemko, 2006; Heckman & LaFontaine, 2008; Sandefur et al., 2006). Buchmann, DiPrete, and McDaniel (2008) noted that the lower rate of high school dropout among females partially explains the new trend favoring women’s college enrollment. With females dropping out of high school at a

lower rate than males, there are more women who are eligible to apply to college than men on average. Likewise, Cho (2007) and Goldin, Katz, and Kuziemko (2006) found that females tend to out-perform males in high school, which makes them better candidates for college enrollment.

In examining the relationship between gender and postsecondary enrollment using cross-tabulations, females consistently had higher enrollment rates in all four outcome measures (see Table 11); however the difference was greatest in terms of four-year enrollment. Being that the current study includes only high school graduates and completers and does not include those dropping out of high school, the argument developed by Buchmann, DiPrete, and McDaniel (2008) is weakened in the context of the current study. In other words, by default, the current study controlled for gender differences in the drop-out rate by only including high school graduates and program completers and large differences still existed between males and females in enrollment rates.

Table 11:
Gender and Postsecondary Enrollment

	Gender	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
2006	Male	38,355	40.2%	35.1%	0.5%	64.6%
Cohort	Female	39,103	48.6%	37.1%	0.7%	73.4%
2007	Male	40,624	37.6%	31.4%	0.3%	62.9%
Cohort	Female	41,511	45.3%	34.0%	0.4%	72.0%
Total	<i>Male</i>	<i>78,979</i>	<i>38.8%</i>	<i>33.2%</i>	<i>0.4%</i>	<i>63.7%</i>
	<i>Female</i>	<i>80,614</i>	<i>46.9%</i>	<i>35.5%</i>	<i>0.5%</i>	<i>72.7%</i>

The effects of socio-economic status on college enrollment

Recent studies document the importance of socio-economic status, measured in terms of income and parental education, on the likelihood of enrolling in college; in general, students from higher socioeconomic status groups are more likely to enroll in a four year college than

students from lower socioeconomic status groups (Ahlburg, McPherson, and Shapiro, 1994; Akerhielm et al., 1998; Aronson, 2008; Beattie, 2004; Choi et al., 2008; Rowan-Kenyon, 2007). Citing Baker and Velez (1996) in a review of recent literature of class-based experiences of postsecondary education, Aronson (2008) explained that students from more advantaged backgrounds are more likely to enroll in four year institutions than students from less advantaged backgrounds, even after controlling for academic performance variables. Similarly, Choi et al. (2008) found that the odds of enrollment for students with parents whose highest level of schooling was a high school degree are 35% less than the odds of enrollment for students who have a parent who has a college degree. However, after controlling for course context—in this case, whether or not students take courses with classmates who have college educated parents—the difference in college enrollment between students of college educated parents and students of non-college educated parents disappears.

Finally, Goldrick-Rab (2006) and Rowan-Kenyon (2007) each found that socioeconomic status not only affects whether or not students enrolled in college, but it also affects the timing of enrollment. Goldrick-Rab (2006) found that students from low SES backgrounds were more likely to interrupt their college enrollment. Goldrick-Rab (2006) also found that social class background plays the strongest role in predicting whether or not a student takes a nontraditional college attendance pattern. In the same way, Rowan-Kenyon (2007) found that students from high socioeconomic status were more likely to enroll in college immediately and less likely to delay enrollment or never enroll. This finding was statistically significant even after controlling for race, gender, financial resources, academic achievement and academic preparation, social capital, and cultural capital.

Cross-tabulations on Table 12 revealed that being economically disadvantaged was related to a decreased likelihood of postsecondary enrollment overall, at two-year institutions, and at four-year institutions, relative to those not economically disadvantaged. In total, the absolute difference in four-year enrollment rates between the groups was 26.2%, while the difference in two-year enrollment rates was much smaller at 2.3%; therefore, most of the difference in the overall enrollment rates could be explained by four-year enrollment.

Table 12:
Disadvantaged Student Status and Postsecondary Enrollment

Cohort	Disadvantaged Status	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
2006	Disadvantaged	13,232	21.1%	34.5%	1.1%	50.3%
	Not Disadvantaged	64,226	49.0%	36.4%	0.5%	72.9%
2007	Disadvantaged	15,502	20.7%	30.8%	0.7%	48.0%
	Not Disadvantaged	66,633	46.3%	33.2%	0.3%	72.0%
Total	<i>Disadvantaged</i>	<i>28,734</i>	<i>21.4%</i>	<i>32.5%</i>	<i>0.4%</i>	<i>49.1%</i>
	<i>Not Disadvantaged</i>	<i>130,859</i>	<i>47.6%</i>	<i>34.8%</i>	<i>0.9%</i>	<i>72.5%</i>

Table 13 and Figure 3, display the interaction of gender and disadvantaged student status on the various postsecondary enrollment rates. In total, being economically disadvantaged decreases the likelihood of enrolling at a four-year institution for both males and females; however, the impact of being disadvantaged on overall, four-year, and two-year enrollment was greater for males than females. Interestingly, disadvantaged females from the 2006 cohort had a higher two-year enrollment rate than their non-disadvantaged counterparts and the opposite was true for the 2007 cohort . This suggests one of two things: 1) a delayed initial two-year enrollment is occurring for disadvantaged females from the 2006 cohort--since those in the 2006 cohort had an additional year to enroll or 2) a certain portion of disadvantaged females from the 2006 cohort are initially enrolling at four-year institutions and

then transferring to two-year institutions, perhaps for financial reasons. However, the exact nature and sequence of the movement between two-year and four-year institutions was not explored in the current study. Disadvantaged males and females also had a higher less than two-year enrollment rate compared to non-disadvantaged counterparts; however, the difference was greater for females (see Table 13).

Figure 3:
Various Enrollment Rates and the Interaction of Gender and Economically Disadvantaged Student Status

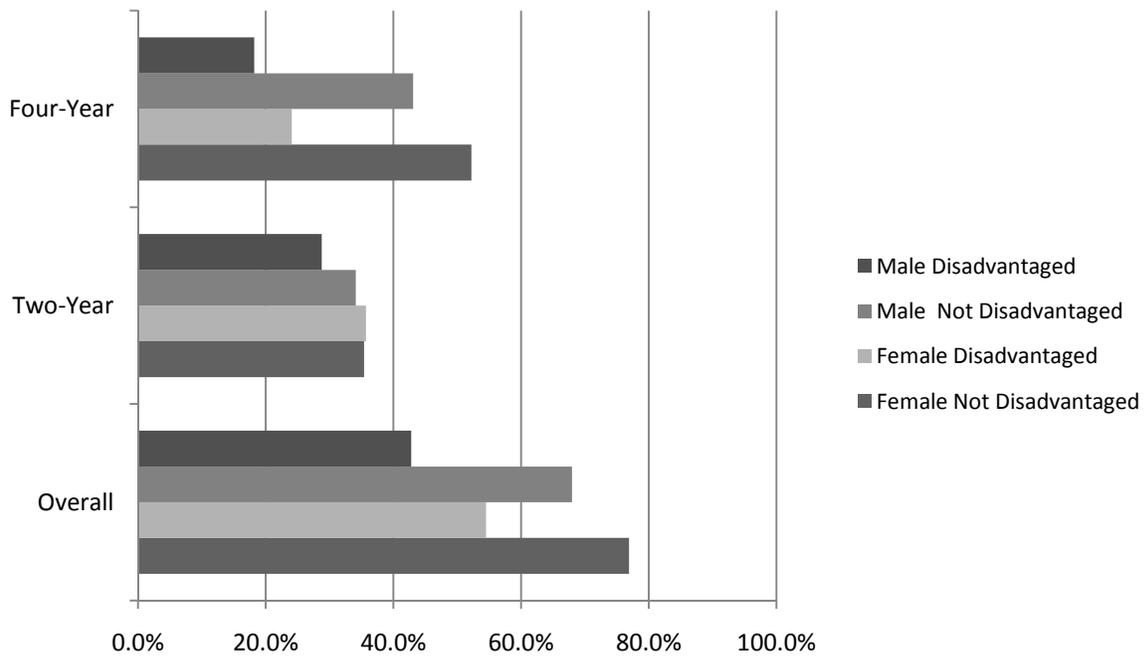


Table 13:

Gender and Disadvantaged Student Status Interaction and Postsecondary Enrollment

Cohort	Graduate Plan	n	Four-year	Two-Year	Less than Two-Year	Overall
2006	F Not Disadvantaged	24,769	53.7%	36.8%	0.5%	77.2%
	F Disadvantaged	3,929	24.9%	38.2%	1.4%	56.0%
	M Not Disadvantaged	22,050	44.3%	36.0%	0.4%	68.6%
	M Disadvantaged	2,730	19.0%	30.4%	0.6%	44.0%
2007	Female Not Disadvantaged	25,464	50.8%	34.1%	0.4%	76.7%
	Female Disadvantaged	4,430	23.5%	33.7%	0.8%	55.3%
	M Not Disadvantaged	22,545	41.9%	32.3%	0.3%	67.4%
	M Disadvantaged	3,006	17.5%	27.4%	0.6%	41.8%
Total	<i>F Not Disadvantaged</i>	<i>65,281</i>	<i>52.2%</i>	<i>35.4%</i>	<i>0.4%</i>	<i>76.9%</i>
	<i>F Disadvantaged</i>	<i>8,359</i>	<i>24.1%</i>	<i>35.7%</i>	<i>1.1%</i>	<i>54.5%</i>
	<i>M Not Disadvantaged</i>	<i>44,595</i>	<i>43.1%</i>	<i>34.1%</i>	<i>0.4%</i>	<i>68.0%</i>
	<i>M Disadvantaged</i>	<i>5,736</i>	<i>18.2%</i>	<i>28.8%</i>	<i>0.6%</i>	<i>42.8%</i>

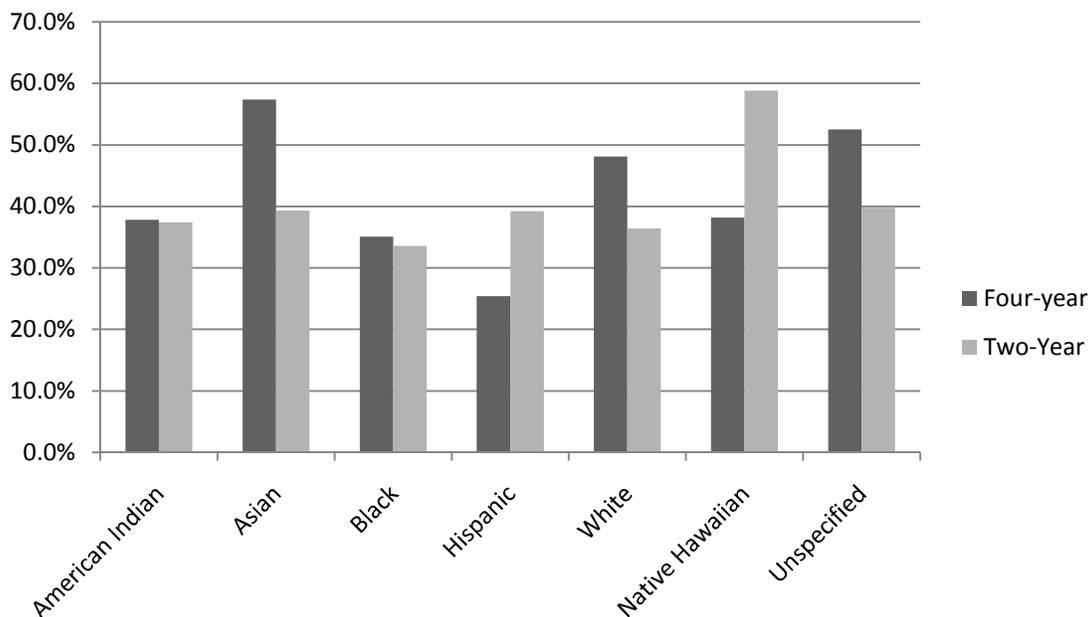
Race and college enrollment

Several studies found that race is associated with the probability of enrollment (Akerhielm et al., 1998; Beattie, 2002; Goldrick-Rab, 2006, Plank & Jordan, 2001). For example, Akerhielm et al. (1998) found that Native Americans, blacks, and Hispanics are least likely to attend postsecondary institutions whereas those classified as Asians/Pacific Islanders are most likely to attend postsecondary institutions.

Not only is race associated with the probability of enrollment, it affects enrollment patterns. For example, Plank and Jordan (2001) found that Asian/Pacific Islanders were more likely than whites to enroll in a 4 year institution versus enrolling at a 2 year institution part time. Moreover, Asian/Pacific Islanders and Hispanics were also more likely than whites to enroll in a 4 year institution versus never enrolling. Finally, African Americans were more likely than whites to enroll in a 4 year institution versus enrolling at a 2 year institution full time or never enrolling. Correspondingly, Goldrick-Rab (2006) found that black and Hispanic students were more likely than white or Asian students to have an interrupted enrollment pattern.

As shown on Figure 4, the enrollment rates for Virginia’s graduates varied by race. In terms of enrollment rates at four-year institutions, Asians had the highest rate, followed by Unspecified, Whites, and Native Hawaiians, while Hispanics and Blacks had the lowest four-year enrollment rates. Native Hawaiians had the highest two-year enrollment rate, followed by American Indians, and Hispanics, and Asians, while Blacks and Whites had the lowest two-year enrollment rates.

Figure 4:
Four-year and Two-year Enrollment Rates by Race



In examining the effects of SES and gender and race Butler (2004) found that in general, the effect of gender varies according to SES in predicting college enrollments. Furthermore, the relationship between SES and gender in predicting college enrollment operates differently among different racial groups. Specifically, Butler (2004) found the following:

- 1) High SES benefits Whites and Hispanics with regard to college enrollment.
- 2) Any positive effect of SES among Blacks and Asians disappears after introducing the interaction of socioeconomic status and gender.

- 3) Being female only increases the chance of college enrollment among Whites.
- 4) White men have an advantage in college enrollment among those in the low SES group.
- 5) Hispanic men have an advantage in college enrollment among those in the high SES group.

Finally, Goldrick-Rab (2006) found that there were systematic differences in enrollment patterns among males and females. Specifically, males were more likely to delay college enrollment than females and females are significantly more likely to stay continuously enrolled.

The following table depicts the interaction of race, gender, and disadvantaged student status in terms of the various postsecondary enrollment outcomes. Disadvantaged White (37.5%), Hispanic (41.4%) , and Black (43.2%) Males had the lowest overall enrollment rates. Non-disadvantaged Asian Females, Asian Males, and White Females had the highest overall enrollment rates. Overall, Asian Males, Asian Females, and American Indian Females had the smallest difference in overall enrollment rates between the disadvantaged and non-disadvantaged segments of their respective subgroups. By far, White Males had the largest difference in overall enrollment rates between the disadvantaged and non-disadvantaged segment of the subgroup.

Table 14:

Gender and Disadvantaged Student Status and Race Interaction and Postsecondary Enrollment

Disadvantaged Status	Race & Gender	n	Four-year	Two-Year	Less than Two-Year	Overall
Not Disadvantaged	Am. Indian F	177	41.2%	39.0%	1.1%	70.6%
	Am. Indian M	185	34.1%	38.4%	0.5%	63.8%
Disadvantaged	Am. Indian F	42	28.6%	40.5%	0.0%	64.3%
	Am. Indian M	33	26.1%	21.7%	0.0%	43.5%
Not Disadvantaged	Asian F	3,418	64.0%	31.5%	0.1%	83.4%
	Asian M	3,646	55.4%	36.1%	0.2%	80.6%
Disadvantaged	Asian F	769	40.1%	48.8%	0.0%	77.6%
	Asian M	727	35.6%	50.1%	0.0%	76.8%
Not Disadvantaged	Black F	12,463	44.3%	35.0%	0.8%	70.2%
	Black M	11,743	33.3%	32.1%	0.7%	58.6%
Disadvantaged	Black F	7,686	28.2%	33.3%	1.4%	56.4%
	Black M	6,236	21.3%	25.8%	0.8%	43.2%
Not Disadvantaged	Hispanic F	2,557	33.0%	39.4%	0.6%	64.3%
	Hispanic M	2,657	26.1%	38.1%	1.1%	58.4%
Disadvantaged	Hispanic F	1,657	16.4%	36.8%	0.4%	48.1%
	Hispanic M	1,451	12.0%	33.1%	0.8%	41.4%
Not Disadvantaged	White F	45,960	54.5%	35.6%	0.3%	79.0%
	White M	46,802	45.4%	34.2%	0.2%	69.8%
Disadvantaged	White F	5,051	18.0%	36.8%	0.9%	50.0%
	White M	4,857	13.2%	28.1%	0.4%	37.5%
Not Disadvantaged	N. Hawaiian F	~	~	~	~	~
	N. Hawaiian M	~	~	~	~	~
Disadvantaged	N. Hawaiian F	~	~	~	~	~
	N. Hawaiian M	~	~	~	~	~
Not Disadvantaged	Unspecified F	638	57.7%	35.6%	0.2%	78.5%
	Unspecified M	575	48.5%	37.6%	0.0%	75.0%
Disadvantaged	Unspecified F	129	29.5%	44.2%	1.6%	65.1%
	Unspecified M	104	28.8%	32.7%	0.0%	55.8%

~: Fewer than 10 students were in cells and led to results suppression to protect student privacy.

School-level effects on college enrollment*Curriculum rigor*

Several studies examined the importance of curriculum rigor in predicting postsecondary outcomes. In general, curriculum rigor affects the probability of enrollment; the more rigorous the curriculum, the more likely it is that the student will eventually enroll in a 4-year institution (Akerhielm et al., 1998; Blossveren 2006; Butler, 2004; Cho, 2007; Engle, 2007;

Goldrick-Rab, 2006; Horn & Nunez, 2000; Perna & Titus, 2004; Perna & Titus, 2005; Rowan-Kenyon, 2007). Curriculum rigor is variously defined and examined in the literature. For example, Blossveren (2006) defined it in terms of English, mathematics, and history requirements that differed by curriculum type; the more rigorous the curriculum, the higher the minimum requirement for each subject. Some studies examine curriculum rigor by studying mathematics course-taking patterns. For example, four studies found that students who completed mathematics programs beyond Algebra II significantly increase their odds of enrollment (Choy, 2001; Nunez & Horn, 2000; Perna & Titus, 2004; Perna & Titus, 2005).

Table 15 and Figure 5 display the diploma type and the four postsecondary enrollment markers. One could make the argument that diploma type is a reflection of curriculum rigor, as those graduating with an advanced diploma would have gone through a more rigorous course of study relative to those graduating with a standard diploma. The results of the current study show that the international baccalaureate (IB) and advanced diploma subgroups had the highest four-year enrollment rates at 91.9% and 72.1% in that order. In contrast, the total four-year enrollment rate for the standard diploma subgroup was 17.5%.

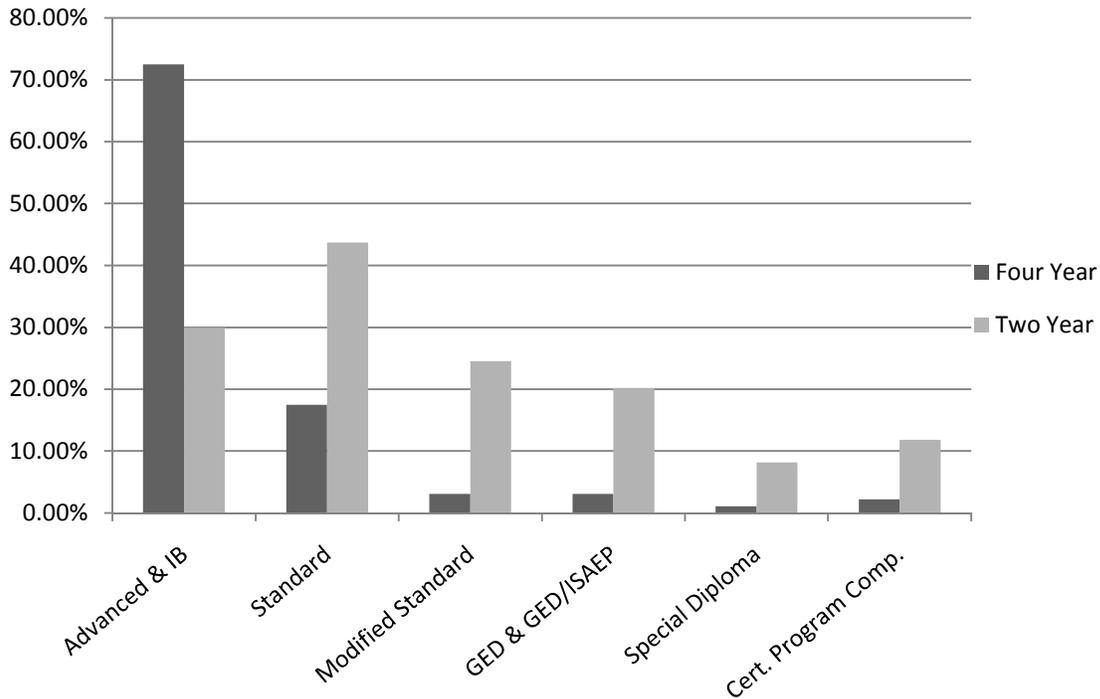
A majority of students in the IB, advanced diploma, and standard diploma groups who enrolled in postsecondary education enrolled in four-year programs. However, this result was most dramatic for the IB group. Specifically, almost all postsecondary enrollment for the IB subgroup was four-year enrollment. The difference between overall enrollment and four-year enrollment was only 0.6% for IB diploma students. In comparison, the difference between overall enrollment and four-year enrollment for the advanced diploma and standard diploma subgroups was 16.7% and 37.9%, respectively.

Table 15:
High School Degree Type and Postsecondary Enrollment Rates

Cohort	Diploma Type	<i>n</i>	Four-year	Two-Year	Less than Two-Year	Overall
2006	IB	727	91.2%	8.9%	0.1%	91.7%
	Advanced Diploma	37,128	74.1%	32.4%	0.2%	89.3%
	Standard Diploma	32,121	18.7%	45.2%	0.9%	56.4%
	Modified Standard Diploma	1,899	3.8%	25.4%	0.6%	28.5%
	General Achievement Dip.	34	8.8%	23.5%	0.0%	29.4%
	GED	1,102	2.7%	20.9%	1.1%	23.2%
	GED as part of ISAEP	1,535	3.7%	22.5%	1.1%	25.6%
	Special Diploma	2,419	1.3%	8.7%	0.4%	10.1%
	Cert. of Program Completion	493	2.8%	13.6%	1.6%	17.0%
2007	IB	773	92.6%	6.3%	0.0%	93.1%
	Advanced Diploma	39,424	70.2%	28.5%	0.1%	88.3%
	Standard Diploma	33,767	16.3%	42.3%	0.6%	54.5%
	Modified Standard Diploma	2,071	2.4%	23.7%	0.6%	25.8%
	General Achievement Dip.	~	~	~	~	~
	GED	1,173	2.9%	18.3%	1.5%	21.8%
	GED as part of ISAEP	2,032	3.1%	19.2%	0.7%	22.4%
	Special Diploma	2,458	1.0%	7.8%	0.3%	8.8%
	Cert. of Program Completion	433	1.4%	9.7%	0.7%	11.5%
Total	<i>IB</i>	<i>1,500</i>	<i>91.9%</i>	<i>7.6%</i>	<i>0.1%</i>	<i>92.5%</i>
	<i>Advanced Diploma</i>	<i>76,552</i>	<i>72.1%</i>	<i>30.4%</i>	<i>0.2%</i>	<i>88.8%</i>
	<i>Standard Diploma</i>	<i>65,888</i>	<i>17.5%</i>	<i>43.7%</i>	<i>0.8%</i>	<i>55.4%</i>
	<i>Modified Standard Diploma</i>	<i>3,970</i>	<i>3.1%</i>	<i>24.5%</i>	<i>0.6%</i>	<i>27.1%</i>
	<i>General Achievement Dip.</i>	<i>~</i>	<i>~</i>	<i>~</i>	<i>~</i>	<i>~</i>
	<i>GED</i>	<i>2,275</i>	<i>2.8%</i>	<i>19.6%</i>	<i>1.3%</i>	<i>22.5%</i>
	<i>GED as part of ISAEP</i>	<i>3,567</i>	<i>3.4%</i>	<i>20.6%</i>	<i>0.9%</i>	<i>23.8%</i>
	<i>Special Diploma</i>	<i>4,877</i>	<i>1.1%</i>	<i>8.2%</i>	<i>0.3%</i>	<i>9.5%</i>
	<i>Cert. of Program Completion</i>	<i>926</i>	<i>2.2%</i>	<i>11.8%</i>	<i>1.2%</i>	<i>14.5%</i>

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Figure 5:
High School Degree Type and Postsecondary Enrollment Rates



Virginia Standards of Learning and College Enrollment

The following two tables display the mean Virginia Standards of Learning Scaled Scores for four separate groups based each individual's highest enrollment in the following ascending order: not enrolled, less than two-year, two-year, and four-year. For example, if a student attended postsecondary at a two-year and four-year institution, the highest enrollment would be four-year regardless of the order of attendance. Those enrolling for at least one semester at a four-year institution by far had the highest mean SOL scaled scores in all subject areas. The mean scaled scores associated with the various enrollment outcomes were slightly higher for the 2007 cohort suggesting higher SOL scaled scores are indicative of shorter times to enrollment. In other words, the additional year to potentially enroll for the 2006 Cohort

allowed some individuals with lower SOL scaled scores to gravitate towards four-year institutions, perhaps from two-year institutions.

For all subject areas, the individuals whose highest enrollment was at a less than two-year institution had lower mean SOL scaled scores than those who did not enroll at any postsecondary institution. This was true for both the 2006 and 2007 Cohorts. For both Chemistry and Algebra II, the individuals whose highest enrollment was at a two-year institution had mean SOL scaled scores that were two points lower than those who did not enroll in postsecondary; for all other subject areas, those whose highest enrollment was at a two-year institution had higher mean SOL scaled scores than those who did not enroll.

Table 16: Enrollment-SOL Scaled Scores Comparison: Highest Post-Secondary Enrollment 2006 Cohort

Highest Enrollment (2006 Cohort)		Algebra 1	Algebra 2	Biology	Chemistry	Earth Science	Geography	Geometry	Reading	Virginia & US History	World History 1	World History 2	Writing
Not Enrolled	Mean	434	447	432	436	430	434	435	447	456	444	440	443
	N	16,477	8,327	16,926	6,461	16,123	7,988	14,968	19,833	16,824	11,659	10,016	19,289
Less than 2-Year	Mean	430	433	426	428	428	425	430	445	449	435	430	442
	N	215	99	212	65	211	103	194	238	207	145	130	227
2-Year	Mean	440	445	438	431	438	448	442	464	465	454	445	459
	N	15,574	11,105	15,917	9,414	14,408	6,775	15,107	17,134	16,106	11,300	11,066	16,985
4-Year	Mean	475	489	471	464	469	485	484	506	506	491	481	504
	N	29,214	29,361	30,072	28,592	22,724	9,277	29,277	31,385	30,414	22,449	26,335	31,157

Table 17: Enrollment-SOL Scaled Scores Comparison: Highest Post-Secondary Enrollment 2007 Cohort

Highest Enrollment (2007 Cohort)		Algebra 1	Algebra 2	Biology	Chemistry	Earth Science	Geography	Geometry	Reading	Virginia & US History	World History 1	World History 2	Writing
Not Enrolled	Mean	440	443	432	435	434	435	436	460	462	446	450	446
	N	18,780	10,224	18,969	8,248	18,344	8,857	17,469	23,675	20,321	13,408	11,127	22,932
Less than 2-Year	Mean	435	428	428	421	424	422	422	454	449	434	438	442
	N	209	92	206	66	213	97	183	241	210	146	109	230
2-Year	Mean	447	441	440	433	445	452	444	482	474	458	458	461
	N	17,391	13,510	17,655	11,790	16,094	7,612	17,358	20,069	19,284	12,675	12,348	19,924
4-Year	Mean	481	489	472	467	474	491	489	531	515	498	497	507
	N	2,8876	29,665	29,290	29,394	22,183	9,119	29,117	32,612	32,224	22,101	25,925	32,433

The following tables display the mean four-year enrollment rates for the various proficiency levels for each of the SOL subject areas. Included in the tables are three participation levels--advanced, proficient, and failed--in addition to a fourth level for those who did not participate in the given subject area. The information is presented separately for each cohort. As would be expected, for each of the SOL subject areas, those achieving the advanced proficiency level had the highest four-year enrollment rates. For the most part, a logical pattern was followed, where achieving the advanced level was indicative of a higher rate than the proficient level, which in turn was higher than failing. Generally speaking, not participating in a particular subject area was indicative of a higher four-year enrollment rate than failing with two exceptions. Failing Algebra II and Chemistry were indicative of higher four-year enrollment rates than not participating. For both Earth Science and Geography, students with no SOL scores on these tests¹ had higher four-year enrollment rates than students achieving the proficient level. Within the three proficiency levels indicating participation, students who had participated in Chemistry and Algebra II assessments had the highest four-year enrollment rates.

The results also suggest the importance of at least being proficient in Reading and Writing, as the four-year enrollment rates for those failing the two aforementioned SOL's was the lowest for both cohorts. This occurred even as the four-year enrollment rates were slightly improved for those failing the SOL's within the 2006 cohort. In other words, the additional year

¹ There are several reasons that students would have no scores in the data. Most frequently, this is because students didn't take the class and therefore did not participate in the assessment. However, it is also possible that students transferred into Virginia public schools after having taking the relevant courses in another state or private school setting, or, that due to certain data limitations, the student participated in the assessment but the test data were not able to be matched with the with postsecondary enrollment.

to potentially enroll at a four-year institution for those within the 2006 cohort did not help those failing the Reading and Writing SOLs to the extent it helped those failing the other SOLs.

The difference in enrollment rates between the cohorts across the advanced and proficient levels was also interesting, as the additional year to enroll at a four-year institution for the 2006 cohort appeared to have more of an impact for those in the proficient group than it did for those in the advanced group across all subject areas. Comparing the two cohorts in terms of the four-year enrollment rates for those within the failing category across all SOL subject areas indicated that the additional year increases the rates.

Table 18:

Virginia SOL Proficiency Levels and Four-Year Enrollment Rates (2006)

Proficiency Level	Algebra 1	Algebra 2	Biology	Chemistry	Earth Science	Geography	Geometry	Reading	Virginia & US History	World History 1	World History 2	Writing
Advanced	78%	80%	80%	86%	70%	66%	77%	71%	69%	75%	78%	74%
Proficient	45%	55%	46%	64%	42%	34%	46%	34%	38%	43%	52%	35%
Failed	10%	26%	10%	29%	12%	11%	15%	4%	9%	9%	15%	5%
No-test data	32%	18%	30%	18%	49%	47%	29%	34%	26%	37%	26%	32%

Table 19:

Virginia SOL Proficiency Levels and Four-Year Enrollment Rates (2007)

Proficiency Level	Algebra 1	Algebra 2	Biology	Chemistry	Earth Science	Geography	Geometry	Reading	Virginia & US History	World History 1	World History 2	Writing
Advanced	75%	79%	76%	83%	66%	62%	75%	64%	65%	70%	74%	72%
Proficient	39%	50%	43%	59%	37%	31%	41%	25%	32%	38%	45%	31%
Failed	7%	23%	7%	22%	9%	8%	12%	3%	6%	9%	11%	4%
No-test data	31%	15%	30%	14%	47%	44%	28%	26%	14%	35%	25%	21%

The following tables display the two-year enrollment rates associated with the various proficiency levels within each of the SOL subject areas. The patterns in the two-year enrollment rates were obviously different than the patterns in the four-year enrollment rates. For two-year enrollment, an SOL scaled score within the proficient level was generally indicative of the highest two-year enrollment rates for each of the subject areas, with the exceptions of Algebra II, Chemistry, World History II, and Geometry. For both Algebra II and Chemistry falling within the failing category was indicative of the highest two-year enrollment rates. It should be noted that a similar pattern was evident in World History II for the 2006 Cohort only and for Geometry the two-year enrollment rates for those falling within the proficient and failing categories was the same. The rate of two-year enrollment associated with failing Reading and Writing was the lowest, again suggesting that minimal proficiency is required in those subject areas.

Table 20:
Virginia SOL Proficiency Levels and Two-Year Enrollment Rates (2006)

Proficiency Level	Algebra 1	Algebra 2	Biology	Chemistry	Earth Science	Geography	Geometry	Reading	Virginia & US History	World History 1	World History 2	Writing
Advanced	24%	25%	22%	18%	29%	33%	25%	30%	31%	28%	25%	29%
Proficient	41%	43%	40%	39%	41%	43%	42%	42%	43%	43%	34%	43%
Failed	36%	51%	37%	53%	36%	32%	42%	20%	34%	31%	40%	24%
No-test data	29%	32%	29%	34%	29%	35%	29%	30%	28%	34%	34%	28%

Table 21:
Virginia SOL Proficiency Levels and Two-Year Enrollment Rates (2007)

Proficiency Level	Algebra 1	Algebra 2	Biology	Chemistry	Earth Science	Geography	Geometry	Reading	Virginia & US History	World History 1	World History 2	Writing
Advanced	21%	19%	20%	15%	27%	30%	21%	28%	27%	25%	23%	24%
Proficient	37%	39%	37%	35%	38%	24%	39%	39%	40%	39%	39%	39%
Failed	28%	47%	31%	49%	32%	30%	39%	17%	31%	28%	34%	22%
No-test data	28%	30%	27%	32%	27%	31%	26%	27%	22%	31%	32%	22%

Generally speaking, the strength and direction of the correlations (Pearson) of the SOL scaled scores to the postsecondary enrollment measures were quite similar across cohorts. Based on Hemphill's (2003) review on correlation coefficient magnitude interpretations, the correlations below can be summarized as follows (see appendix). There was a strong positive correlation between reading and writing and any postsecondary enrollment. All of the other SOL's were moderately correlated in a positive fashion with any postsecondary enrollment. All of the SOL's had a weak negative relationship with less than two-year enrollment as the correlations were all weaker than $-.05$. All of the SOL scaled scores had a weak negative correlation with two-year postsecondary enrollment with the exception of Algebra II and Chemistry (moderate negative correlation), while Geography, Reading, and Writing had the weakest negative relationship with that measure. This is consistent with students scoring higher on the assessments being less likely to attend two-year postsecondary schools.

Table 22:

Correlations of Virginia Standard of Learning Scaled Scores with Post-Secondary Enrollment (2006)

	Any P.S.	4-YR	2-YR	<2-YR
Algebra 1	.271	.406	-.127	-.035
Algebra 2	.181	.343	-.204	-.033
Biology	.288	.420	-.126	-.042
Chemistry	.158	.332	-.235	-.028
Earth Science	.256	.359	-.069	-.034
Geography	.292	.387	-.037	-.042
Geometry	.260	.400	-.144	-.040
Reading	.350	.445	-.068	-.038
VA & U.S. History	.280	.402	-.109	-.039
World History 1	.291	.413	-.116	-.040
World History 2	.239	.370	-.154	-.037
Writing	.350	.465	-.089	-.038

Table 23:

Correlations of Virginia Standard of Learning Scaled Scores with Post-Secondary Enrollment (2007)

	Any P.S.	4-YR	2-YR	<2-YR
Algebra 1	.275	.403	-.133	-.030
Algebra 2	.195	.370	-.222	-.031
Biology	.294	.412	-.118	-.032
Chemistry	.174	.346	-.231	-.030
Earth Science	.264	.352	-.066	-.035
Geography	.300	.386	-.041	-.038
Geometry	.278	.424	-.153	-.038
Reading	.374	.469	-.075	-.037
VA & U.S. History	.294	.409	-.115	-.040
World History 1	.294	.405	-.119	-.041
World History 2	.253	.379	-.162	-.037
Writing	.352	.471	-.017	-.035

Table 24:
Correlations of Virginia Standard of Learning Scaled Scores with Post-Secondary Enrollment

	Any P.S.	4-YR	2-YR	<2-YR
Algebra 1	.271	.402	-.132	-.033
Algebra 2	.190	.358	-.212	-.031
Biology	.291	.416	-.122	-.037
Chemistry	.167	.339	-.233	-.029
Earth Science	.259	.354	-.069	-.035
Geography	.296	.385	-.039	-.040
Geometry	.269	.412	-.149	-.039
Reading	.356	.448	-.077	-.038
VA & U.S. History	.286	.403	-.114	-.040
World History 1	.291	.407	-.118	-.040
World History 2	.243	.368	-.162	-.038
Writing	.351	.468	-.099	-.036

Recommendations for Further Investigation

1. Explore the relationship between time to enrollment and the various SOL scaled scores to determine if additional time allows those with lower SOL scaled scores to gravitate towards four-year institutions.
2. As planned, develop measures of persistence for those enrolling at four year institutions and measures of success for those enrolling at two-year institutions (transferring to a four-year or obtaining a degree or certificate) and determine how well the SOL scaled scores predict each.
3. Investigate the how these trends vary by group, particularly race, gender, and disadvantaged student status and their interaction.

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Appendix

Table 25:
Race and Postsecondary Enrollment

Cohort	Race	n	Four-year	Two-Year	Less than Two-Year	Overall
2006	American Indian	222	37.8%	37.4%	0.0%	65.8%
	Asian	4,172	57.4%	39.3%	0.1%	81.6%
	Black	18,254	35.1%	33.6%	1.1%	60.4%
	Hispanic	3,889	25.4%	39.2%	0.9%	56.5%
	White	50,285	48.1%	36.4%	0.4%	72.0%
	Native Hawaiian	68	38.2%	58.8%	0.0%	79.4%
	Unspecified	568	52.5%	39.8%	0.2%	76.2%
2007	American Indian	205	34.1%	38.5%	1.5%	65.4%
	Asian	4,379	54.2%	34.0%	0.1%	80.5%
	Black	19,874	32.8%	31.0%	0.7%	58.5%
	Hispanic	4,343	22.4%	35.7%	0.6%	53.9%
	White	52,385	45.2%	33.0%	0.3%	70.9%
	Native Hawaiian	71	43.7%	31.0%	0.0%	70.4%
	Unspecified	878	47.5%	35.1%	0.6%	73.0%
Total	<i>American Indian</i>	<i>427</i>	<i>36.1%</i>	<i>37.9%</i>	<i>0.7%</i>	<i>65.6%</i>
	<i>Asian</i>	<i>8,551</i>	<i>55.8%</i>	<i>36.6%</i>	<i>0.1%</i>	<i>81.0%</i>
	<i>Black</i>	<i>38,128</i>	<i>33.9%</i>	<i>32.2%</i>	<i>0.9%</i>	<i>59.4%</i>
	<i>Hispanic</i>	<i>8,232</i>	<i>23.8%</i>	<i>37.4%</i>	<i>0.7%</i>	<i>55.2%</i>
	<i>White</i>	<i>102,670</i>	<i>46.6%</i>	<i>34.7%</i>	<i>0.3%</i>	<i>71.4%</i>
	<i>Native Hawaiian</i>	<i>139</i>	<i>41.0%</i>	<i>44.6%</i>	<i>0.0%</i>	<i>74.8%</i>
	<i>Unspecified</i>	<i>1,446</i>	<i>49.4%</i>	<i>36.9%</i>	<i>0.4%</i>	<i>74.3%</i>

Table 26:
CTE Completion Status, Dual Enrollment Status, and Postsecondary Enrollment

Cohort	Dual Enrollment Status	n	Four-year	Two-Year	Less than Two-Year	Overall
2006	CTE & Dually-Enrolled	4,382	57.4%	42.7%	0.8%	83.0%
	CTE & Not Dually-Enrolled	24,624	37.4%	40.1%	0.6%	66.5%
	Non-CTE & Dually Enrolled	6,197	71.3%	34.2%	0.4%	87.6%
	Non-CTE & Not Dually Enrolled	39,710	45.3%	33.1%	0.5%	67.9%
2007	CTE & Dually-Enrolled	5,415	50.4%	38.7%	0.4%	79.1%
	CTE & Not Dually-Enrolled	25,107	33.3%	37.6%	0.4%	64.8%
	Non-CTE & Dually Enrolled	6,609	68.1%	28.7%	0.1%	86.1%
	Non-CTE & Not Dually Enrolled	42,562	43.0%	29.6%	0.4%	66.3%
Total	<i>CTE & Dually-Enrolled</i>	<i>9,797</i>	<i>53.5%</i>	<i>40.5%</i>	<i>0.6%</i>	<i>80.8%</i>
	<i>CTE & Not Dually-Enrolled</i>	<i>49,731</i>	<i>35.4%</i>	<i>38.8%</i>	<i>0.5%</i>	<i>65.7%</i>
	<i>Non-CTE & Dually Enrolled</i>	<i>12,806</i>	<i>69.7%</i>	<i>31.3%</i>	<i>0.3%</i>	<i>86.8%</i>
	<i>Non-CTE & Not Dually Enrolled</i>	<i>82,272</i>	<i>44.1%</i>	<i>31.3%</i>	<i>0.5%</i>	<i>67.0%</i>

Interpretations of the correlation coefficient magnitudes

The current study used guidelines established by Hemphill (2003) and Lotkowski, Robbins, and Noeth (2004) to interpret the magnitudes of correlation coefficients. These recommended guidelines are less conservative than the guidelines of Cohen (1988). In a re-analysis of two meta-analytic studies focusing on psychological assessments, Hemphill (2003) found that the value that Cohen (1988) assigned to represent a “large correlation coefficient occurs somewhat infrequently in many key research studies in psychology and that a lower value might be warranted in some instances” (p. 79). Hemphill (2003) pointed out that the methods by which variables are measured vary considerably across studies and reasoned that if these methods were more consistent across studies, the magnitudes of the correlation coefficients would be larger. Similarly, Lotkowski, Robbins, and Noeth (2004) provided a chart of correlation coefficients showing the strength of relationship between individual and non-academic factors with college retention and rated each of these coefficients as strong, moderate or weak. A range of values rated as weak, moderate, and strong by Lotkowski, Robbins and Noeth (2004) is given in Table 27. A distribution of correlation coefficients that Hemphill (2003) derived from meta-analytic studies and classified into lower, middle and upper quartiles is given in Table 28.

Table 27:
Classification of observed correlations by Lotkowski, Robbins, and Noeth (2004)

Weak	Moderate	Strong
.05-.066	.188-.262	.34-.366

Table 28 :
Distribution of correlation magnitudes from empirical studies by Hemphill (2003)

Lower quartile	Middle quartile	Upper quartile
< .15	.15-.35	> .35