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ABSTRACT

The release of the first Student Outcomes and Achievement Report (SOAR) in 1994 by the Maryland Higher Education Commission revealed the degree to which the graduates of the state's high schools required remediation in higher education. SOAR suggested that at least one-half of all Maryland high school graduates entering the state's colleges and universities needed remediation before taking college-level courses. Since Frederick Community College (FCC) has a larger proportion of first-time freshman enrollment from local high schools than most other community colleges in Maryland, SOAR held great significance. To expand upon SOAR and to examine specifically the college readiness of students entering FCC from Frederick County public schools, FCC administered three placement tests to groups of students who shared characteristics based on course selection, academic achievement, and released time in the 12th grade year. Statistical tests were used to determine significant differences between the groups. Results indicated that those students who complete rigorous courses in English, social studies, math, science, and foreign language at high school levels of achievement have the greatest probability of being prepared for college. (EMH)

High School Course Choice, Performance and Readiness for College

Frederick County Public High School Graduates Enrolling at Frederick Community College

Prepared by:
Planning, Research & Evaluation
January 1998

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High School Course Selection and Performance As it Relates to Readiness for College

Frederick County Public High School Graduates Enrolling at Frederick Community College

Purpose of Report

A considerable amount of discussion has taken place in recent years between the Frederick County Public Schools (FCPS) and Frederick Community College (FCC) regarding the readiness of graduates of the FCPS high schools for college-level work as measured on the FCC placement tests. While a summary of the results of placement test performance of freshmen has been available to college staff for many years, interest was heightened with the release of the first Student Outcomes and Achievement Report (SOAR) in 1994 by the Maryland Higher Education Commission (MHEC). The SOAR report, as it came to be known, for the first time publicly revealed the degree to which the graduates of the State's high schools required remediation in mathematics, writing, and reading at the public two and four-year colleges and universities in Maryland.

The SOAR report acknowledged several inherent limitations in the collection of data from the colleges. There was little consistency in the tests used to determine readiness and even less consistency in the achievement levels necessary to "test out of" remedial courses. In addition, colleges had different approaches to the assignment of credit for remedial courses. While most awarded no credit for remedial courses, some students were able to earn "in-house" credit. Because of these limitations, the SOAR report discouraged comparisons across counties and institutions regarding remediation rates, however, the inevitable comparisons were drawn. Educators, politicians, and the media began to compare the remediation rates for incoming freshmen at individual colleges, for county schools systems, and even for the graduates of individual high schools.

The first wave of public concern about the results of the SOAR report centered on the sheer numbers of students entering the State's public colleges and universities seemingly unprepared for college-level courses and enrolled in remedial courses. A popular refrain was that the State was being forced to "pay for the same education twice." Despite the limitations of the data, it became clear that at least one-half of all Maryland high school graduates entering the State's colleges and universities needed remediation before taking college-level courses. Since more than 50% of all college freshmen in Maryland enroll at one of the State's eighteen community colleges, the direction of the concern in most jurisdictions quickly turned to the large number of graduates enrolled at the local community college.

Since FCC has a larger proportion of first-time freshman enrollment from the local high schools than most other community colleges in Maryland, the SOAR report took on an even greater significance in Frederick County. A coalition of educators from the FCPS and FCC formed during 1994/95 to discuss SOAR and the meaning of the data, and to develop an agenda.

Among the more significant outcomes from those discussions have been; the sharing of information about the specific skills being assessed at FCC with FCPS discipline supervisors and teachers, immediate feedback to FCPS staff from FCC regarding the assessment results of the most recent FCPS graduating class enrolling at FCC, the analysis of activities and learning outcomes in various levels of courses in FCPS high schools, the development of FCC math placement test "prep classes" offered at local high schools, and, in 1996/97, the formation of two taskforces of FCC and FCPS staff to address "readiness" and "articulation."

One of the recurring themes in the early discussions of the need for remediation by FCPS graduates was the observation from FCC staff that there seemed to be a relationship between the level of course taken in high school (particularly English and mathematics), the grade received, and performance on FCC's placement tests. While, on the surface, these observations seemed rather obvious, it was their specific nature that led to further discussions and, eventually, to more comprehensive research and hypothesis testing.

The picture emerging from FCC advisors and from a preliminary examination of the high school transcripts from students who failed to successfully complete all or portions of the FCC placement tests in mathematics, reading, and writing seemed to focus on students who were at "merit" level in high school. There is general agreement among educators that students who take the most difficult subjects in their high school in English, mathematics, social studies, science, and foreign language and, who achieve at high levels, will be the most "college-prepared." However, many more students who take less rigorous pathways through high school eventually wind up at two and four-year colleges than those described above. In the FCPS, those students taking "merit" level courses (one step down from "honors" level courses) form the largest group of students enrolled in high school and the largest group of students who eventually enroll in college. While not all students enrolled in "merit" level courses are remedial once they get to college, the issue of performance on the placement tests is viewed to be much more critical with this group than with the "honors' group. There seems to be no issue with those students taking "directed" (lowest academic level) classes since virtually all students who enroll at FCC having taken "directed" level courses in high school are remedial in all three academic skill areas.

However, as long as college-bound students elect courses at the "merit" level and as long as the "merit" level classes purport to afford college-level preparation, it is worthwhile to examine the college readiness of those students who follow this pathway through the FCPS to FCC. This report will draw comparisons between those students enrolled in different levels of instruction in the FCPS and their performance on the FCC placment tests. Statistical tests will be used to determine if there are significant differences in the outcomes on the three FCC placment tests between groups of students who share characteristics based on course selection (level), academic achievement (grade), and released time in the 12th grade year. The general null hypothesis that will be tested is that there will be no observed differences on the dependent variables (FCC placement test results) on the various categories of independent variables at the level of significance of $p > .05$.

Prepared by: James M. Holton,
Research Analyst, January, 1998

Executive Summary

Of the graduates of the Frederick County high schools who enrolled at Frederick Community College for the Fall 1997 semester:

- More than one-half (57%) took a math class in the 12th grade. Of that group, 83% took a math class at the Algebra II level or higher. The average grade achieved by students taking a math course in the 12th grade was a C+.

- Two-thirds (67%) took Merit level English in the 11th grade. The average grade achieved in 11th grade English was a C+.

- More than one-half (52%) took Merit level English in the 12th grade. The average grade achieved in 12th grade English was a C+.

- More than three-fourths (77%) were released from at least one class during the 12th grade year for an approved alternative activity. The typical student granted released time was released for an average of nearly three periods (2.67) in an eight-period school year.

- Those who took a math class in the 12th grade year had a significantly greater chance of satisfactory performance on the FCC Mathematics Placement Test than those who did not. Those students who took AP Calculus, Pre-Calculus, or Statistics and Probability and who achieved grades of "A," or "B" had the greatest chance of showing satisfactory performance. The grade of "C" in a 12th grade math course had very little reliability as a predictor for success on the FCC Mathematics Placement Test.

- Those who took Honors level 11th grade English had a significantly greater chance of satisfactory performance on the FCC Reading and Writing Placement Tests than those who took Merit or Directed levels. Those who achieved grades of "A," or "B" had the greatest chance of showing satisfactory performance.

- Those who took AP English or Studies in Composition in the 12th grade had a significantly greater chance of showing satisfactory performance on the FCC Writing Test than those who took Humanities, Merit, or Directed English 12. Those who achieved grades of "A," or "B" had the greatest chance of showing satisfactory performance.

- Those who took AP English, Studies in Composition, or Humanities in the 12th grade had a significantly greater chance of showing satisfactory performance on the FCC Reading Placement Test than those who took Merit or Directed English 12. Those who achieved grades of "A," or "B" had the greatest chance of showing satisfactory performance.

- In general, a grade of "C" in any merit level English course in the 11th or 12th grade or math course in the 12th grade is an unreliable predictor for success on the FCC Mathematics, Reading, and Writing Tests.

- There is not a significant relationship between performance on the FCC Mathematics, Reading, and Writing Tests and the granting of Released Time. Nor is there a significant relationship between the number of periods granted and performance.

Methodology

A total of 448 graduates of the seven public high schools in Frederick County, Maryland enrolled at Frederick Community College in the Fall 1997 semester. Of that group, 336 presented high school transcripts complete through the end of the senior year.

This report will address three research questions:

1. What is the relationship between mathematics course selection and achievement in the senior year and performance on the FCC mathematics placement test?

2. What is the relationship between English course level and achievement in the junior and senior year and performance on the FCC reading and writing placement tests?

3. What is the relationship between "released time" activities in the senior year (Work Study, Concurrent College Enrollment, Community Service, Administrative Attendance Waiver, Office or Classroom Aide, Intern/Mentor, and other approved activities) and performance on the FCC mathematics, reading, and writing placement tests?

Each complete transcript was examined for the following independent variables:

1. Did the student take a math class in the 12th grade?
2. If so, what was the title of the math course?
3. Grade in 12th grade math course.
4. English course level in the 11th grade.
5. Grade in 11th grade English course.
6. English course level and title in the 12th grade.
7. Grade in 12th grade English course.
8. Did the student have any released time during the 12th grade?
9. If so, what was the total number of periods released?

Each student's placement test results at FCC was examined for the following dependent variables:

1. Mathematics placement test result.
2. Reading placement test result.
3. Writing placement test result.

Math Course in the 12th Grade

More than one-half (56.5%) of the students took a math class in the 12th grade. The distribution of math classes is shown below:

Calculus I/II -	12.2%
Pre-Calculus -	20.9%
Statistics/Probability -	26.0%
Algebra III -	2.0%
Algebra II -	21.9%
Geometry -	6.1%
Business Math -	10.7%

The cumulative GPA for the students who took a math course in the 12th grade was 2.37, or slightly less than a C+.

Eighty-three percent of the students who took a math course in the 12th grade were enrolled in a course that purports to have a course content at or above the intermediate algebra level.

English Course in the 11th Grade

The distribution of students among the three levels of 11th grade English in the FCPS high schools is shown below:

Honors English 11-	30.1%
Merit English 11-	66.7%
Directed English 11-	3.3%

The cumulative GPA for 11th grade English was 2.56, or a C+.

English Course in the 12th Grade

The distribution of students among the courses that qualify for the 12th grade English requirement is shown below:

AP English-	7.7%
Studies in Composition-	19.0%
Humanities-	17.9%
Merit-	51.8%
Directed-	3.6%

The cumulative GPA for 12th grade English was 2.57, or a C+.

Released Time in the 12th Grade

Seventy-seven percent of all students surveyed were released from class to participate in an approved alternative activity. All high schools in Frederick County operate on a four-period day in a two-semester format. All students, therefore, have the opportunity to take eight classes each year. The average number of class periods approved for students with released time was 2.67 periods per year.

Performance on FCC's Mathematics Placement Test

The performance of the **survey sample** on the FCC mathematics placement test is shown below:

No Developmental Math Required-	29.5%
MA 092 Required-	28.3%
MA 091 Required-	22.9%
MA 090 Required-	19.3%

The performance of **all** 1997 high school graduates entering FCC for the Fall 1997 semester is shown below:

No Developmental Math Required-	28.1%
MA 092 Required-	28.0%
MA 091 Required-	22.8%
MA 090 Required-	21.1%

Performance on FCC's Reading Placement Test

The performance of the **survey sample** on the FCC reading placement test is shown below:

No Developmental Reading Required-	72.6%
EN 052 Required-	22.0%
EN 051 Required-	5.4%

The performance of **all** 1997 high school graduates entering FCC for the Fall 1997 semester is shown below:

No Developmental Reading Required-	72.4%
EN 052 Required-	22.1%
EN 051 Required-	5.5%

Performance on FCC's Writing Placement Test

Performance of the **survey sample** on the FCC writing placement test is shown below:

No Developmental Writing-	53.9%
EN 050A Required-	39.3%
EN 050 Required-	6.8%

The performance of **all** 1997 high school graduates entering FCC for the Fall 1997 semester is shown below:

No Developmental Writing-	52.1%
EN 050A Required-	40.4%
EN 050 Required-	7.4%

Validity of Sample

The distributions of the survey sample (336 students) when compared to the distributions of the total population (533) of 1997 high school graduates' performance on all three placement tests indicate that the findings represent an accurate sampling. Therefore, the conclusions drawn from the results of an analysis can be safely generalized to the total population of 1997 high school graduates entering FCC for the Fall 1997 semester.

Relationship Between Mathematics Course and Achievement in the 12th Grade and Performance on the FCC Mathematics Placement Test

Comparisons to performance on the FCC mathematics placement test were made using three variables; MATH12 (had the student taken a math course in the 12th grade?), MACOURSE (if the student had taken a math course in the 12th grade, the name of the course), and MAGRADE (the final grade in the math course taken in the 12th grade). Chi-square analysis was used to determine if observed distributions on the four possible outcomes of taking the math placement test (no developmental math required, MA 092 required, MA 091 required, and MA 090 required) exceeded expected distributions at the $p < .05$ level of significance.

The analysis showed that the performances on the FCC math placement test of students who take a math course in the senior year are significantly enhanced over those who do not take math in the senior year. The following table shows that there is a positive dependent relationship between whether a student takes math during the 12th grade and successful completion of the FCC math placement test.

	No Developmental Math Required	Developmental Math Required	Total
Took math in 12th grade	68 (35%)	127(65%)	195
No math in 12th grade	30 (21%)	110 (79%)	140
Total	98 (29%)	237 (71%)	335

*The differences between groups is significant
$x^2 = 5.93$, df=1, $p < .05$

The data also showed significance associated with specific math courses taken during the 12th grade.

Math Course	No Developmental Math Required	Developmental Math Required	Total
AP Calculus	22 (92%)	2 (8%)	24
Pre-Calculus	20 (50%)	20 (50%)	40
Statistics/Probability	21 (41%)	30 (59%)	51
Algebra III	1 (25%)	3 (75%)	4
Algebra II	2 (5%)	41 (95%)	43
Geometry	0 (0%)	12 (100%)	12
Business Math	2 (10%)	19 (90%)	21
Total	68 (35%)	127 (65%)	195

*The differences between courses taken is significant
$x^2 = 68.46$, df=6, $p < .05$

The data also showed significance associated with grade received in the math course taken in the senior year.

Grade Received	No Developmental Math Required	Developmental Math Required	Total
A	19 (66%)	10 (34%)	29
B	25 (40%)	37 (60%)	62
C	18 (26%)	50 (74%)	68
D	5 (20%)	20 (80%)	25
F	1 (9%)	10 (91%)	11
Total	68 (35%)	127 (64%)	195

*The differences between grades received is significant
$x^2 = 20.37$, df=4, $p < .05$

The results of this analysis confirms much of what we already know about math achievement. Students who do better in math in high school tend to take more math classes at a higher level. Students who have higher math aptitudes and abilities are more likely to take higher level math classes at an earlier grade level than students with lower math aptitudes and abilities. This study supports the view that those students who take higher levels of mathematics and achieve grades of A, or B are better prepared for college-level math and have a significantly better chance of demonstrating their competency on a college-level math placement test. Conversely, students whose last math class in high school is at a less rigorous level and whose math grades are C or below have a significantly greater probability of requiring one or more semesters of developmental math in college.

Of particular notice is the unreliability of the grade of "C" as a measure of mastery of algebraic math skills and concepts. By examining the following tables closely, we can see that **no** student receiving a grade of "C" in Algebra II taken in the 12th grade successfully completed the FCC math placement test. Only **4 out of 14** students receiving a grade of "C" in Pre-Calculus taken in the 12th grade successfully completed the FCC math placement test. Only 26% of students receiving a grade of "C" in **any** math course taken in the senior year successfully completed the math placement test and, of those that did, all had taken AP Calculus, Pre-Calculus, or Statistics and Probability.

Grade Distribution for Students Enrolled in Math Course in the 12th Grade and Performance on FCC Math Placement Test

	A		B		C		D		F	
Course	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*
AP Calculus	7	0	4	0	9	1	2	1	0	0
Pre-Cal	3	0	10	6	4	10	3	4	0	1
Stat/Prob	5	3	10	14	5	7	0	3	1	2
Algebra III	1	1	0	2	0	0	0	0	0	0
Algebra II	1	3	1	5	0	19	0	8	0	6
Geometry	0	1	0	4	0	5	0	2	0	0
Bus Math	2	2	0	6	0	8	0	2	0	1

Relationship Between 11th Grade English Course and Achievement and Performance on the FCC Writing and Reading Placement Test

Comparisons to performance on the FCC writing and reading placement test were made using two variables; ENG11 (the level of English course taken in the 11th grade), ENG11GR (the final grade in the English course taken in the 11th grade). Chi square analysis was again used to determine if observed distributions on the three possible outcomes of taking the reading placement test (no developmental reading required, EN 052 required, or EN 051 required) or the writing placement test (no developmental writing required, EN 050A required, EN 050 required) exceeded expected distributions at the $p > .05$ level of significance.

The analysis showed that students who take Honors level of English in the 11th grade are significantly more likely to successfully complete the FCC writing and reading placement test and that students who take merit level English in the 11th grade are significantly more likely to require developmental writing and reading. It also showed that students who receive grades of "A" and "B" in 11th grade English, regardless of level, are significantly more likely to successfully complete the FCC writing and reading placement tests and that students who receive grades of "C," "D," and "F" are significantly more likely to require developmental writing and reading.

Course	No Developmental Writing Required	Developmental Writing Required	Total
Honors 11th English	82 (80%)	21 (20%)	103
Merit 11th English	105 (45%)	126 (55%)	231
Directed 11th English	0 (0%)	11 (100%)	11

*The differences between groups is significant
$x^2 = 46.92$, df = 2, $p < .05$

Grade in 11th Grade English	No Developmental Writing Required	Developmental Writing Required	Total
A	39 (85%)	7 (15%)	46
B	88 (59%)	60 (41%)	148
C	43 (39%)	66 (61%)	109
D	16 (41%)	23 (59%)	39
F	1 (33%)	2 (67%)	3

*The differences between groups is significant
$x^2 = 31.78$, df = 4, $p < .05$

Course	No Developmental Reading Required	Developmental Reading Required	Total
Honors 11th English	96 (93%)	7 (7%)	103
Merit 11th English	154 (67%)	77 (33%)	231
Directed 11th English	1 (9%)	10 (91%)	11

*The differences between groups is significant
$x^2 = 48.53$, df = 2, $p < .05$

Grade in 11th Grade	No Developmental Reading Required	Developmental Reading Required	Total
A	41 (89%)	5 (11%)	46
B	114 (77%)	34 (23%)	148
C	72 (66%)	37 (34%)	109
D	22 (56%)	17 (44%)	39
F	2 (67%)	1 (33%)	3

*The differences between groups is significant
$x^2 = 15.36$, $df = 4$, $p < .05$

Relationship Between 12th Grade English Course and Achievement and Performance and the FCC Writing and Reading Placement Test

Comparisons to performance on the FCC writing and reading placement test were made using two variables: ENG12 (the level or title of English course taken in the 12th grade), ENG12GR (the final grade in the English course taken in the 12th grade). Chi square analysis was again used to determine if observed distributions on the three possible outcomes of taking the writing placement test (no developmental writing required, EN 050A required, EN 050 required) or the reading test (no developmental reading required, EN 052 required, EN 051 required) exceeded expected distributions at the $p < .05$ level of significance.

Similarly, the analysis of the performance of the FCC writing and reading placement tests showed that students who take Advanced Placement (AP) English and Studies in Composition are significantly more likely to successfully complete the FCC writing and reading placement test and that students who take merit level 12th grade English are significantly more likely to require developmental writing and reading. It also showed that students who receive grades of "A" and "B" in 12th grade English, regardless of level, are significantly more likely to successfully complete the FCC writing and reading placement tests and that students who receive grades of "C," "D," and "F" are significantly more likely to require developmental writing and reading.

Course	No Developmental Reading Required	Developmental Writing Required	Total
AP English	25 (96%)	1 (4%)	26
Studies in Composition	43 (67%)	21 (33%)	64
Humanities	38 (61%)	24 (39%)	62
Merit 12th English	80 (44%)	101 (56%)	181
Directed 12th English	1 (8%)	11 (92%)	12

*The differences between groups is significant
$x^2 = 41.50$, df = 4, $p < .05$

Grade in 12th Grade English	No Developmental Writing Required	Developmental Writing Required	Total
A	32 (70%)	14 (30%)	46
B	92 (63%)	54 (37%)	146
C	53 (46%)	63 (54%)	116
D	10 (27%)	27 (73%)	37

*The differences between groups is significant
$x^2 = 23.33$, df = 3, $p < .05$

Course	No Developmental Reading Required	Developmental Reading Required	Total
AP English	25 (96%)	1 (4%)	26
Studies in Composition	55 (86%)	9 (14%)	64
Humanities	53 (85%)	9 (15%)	62
Merit 12th English	118 (65%)	63 (35%)	181
Directed 12th English	0 (0%)	12 (100%)	12

*The differences between groups is significant
$x^2 = 55.12$, df = 4, $p < .05$

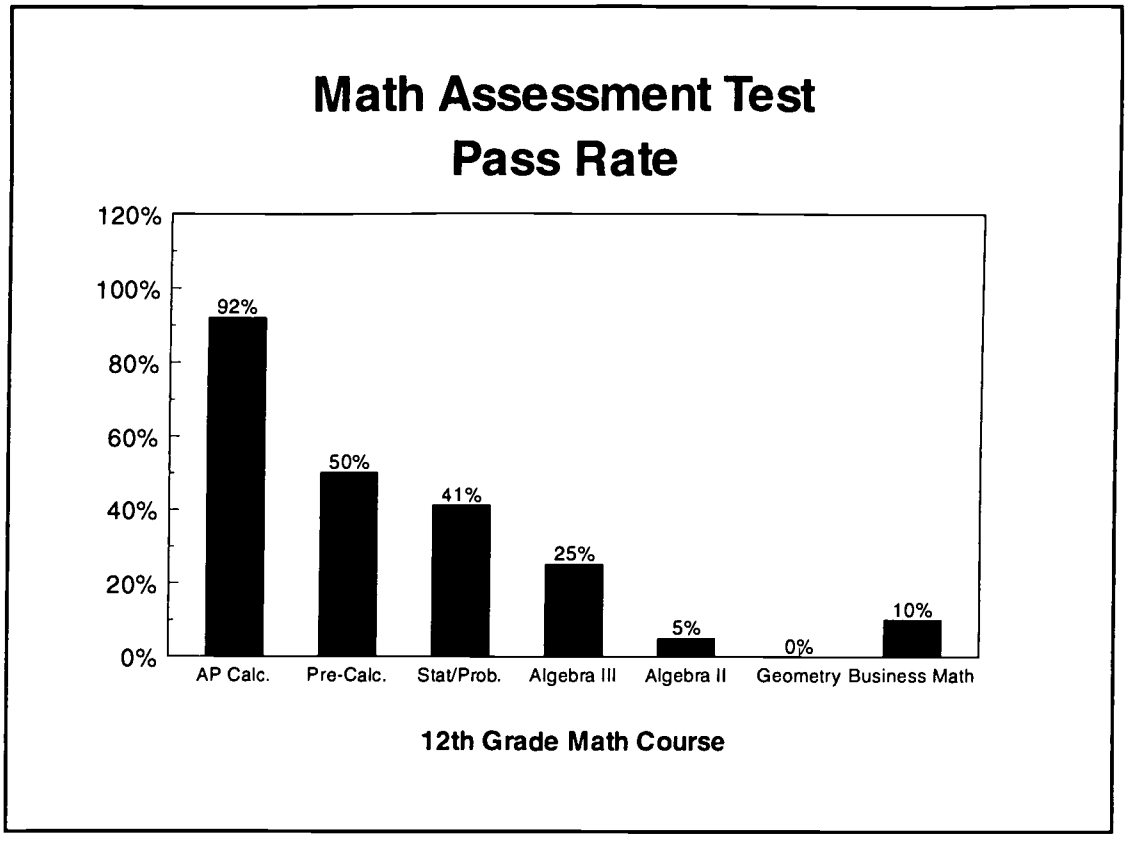
Grade in 12th Grade	No Developmental Reading Required	Developmental Reading Required	Total
A	36 (78%)	10 (22%)	46
B	113 (77%)	33 (23%)	146
C	84 (72%)	32 (28%)	116
D	18 (49%)	19 (51%)	37

*The differences between groups is significant
$x^2 = 13.14$, $df = 3$, $p < .05$

There is a significant relationship between English course choice and achievement in the 11th and 12th grade and student performance on the FCC writing and reading placement tests. Students in this study who had taken "honors" level 11th grade English, and/or AP English or Studies in Composition in the 12th grade had a significantly greater chance of successfully completing the FCC writing placement test. Similarly, students who had taken "honors" level 11th grade English, and/or AP English, Studies in Composition, or Humanities in the 12th grade had a significantly greater chance of successfully completing the FCC reading placement test. As noted in the analysis of math courses and achievement, the grade of "C" in "merit" level courses is an unreliable predictor of future success on college placement tests.

This study would suggest that the seeds of unsuccessful performance on the FCC writing and reading test are sown as early as the 11th grade. Two-thirds of FCC freshman class from the FCPS was enrolled in "merit" level English in the 11th grade. While 33% of students receiving a grade of "C" in 11th grade "honors" English did not pass the FCC writing placement test, 70% of those enrolled in "merit" 11th grade English receiving a grade of "C" did not pass the FCC writing placement test.

A similar disparity if found in performance on the FCC reading placement test. While only 7% of students receiving a grade of "C" in 11th grade "honors" English did not pass the FCC reading placement test, 41% of students receiving a grade of "C" in 11th grade "merit" English did not pass the FCC reading placement test.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100%
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20%
0%
92%
50%
41%
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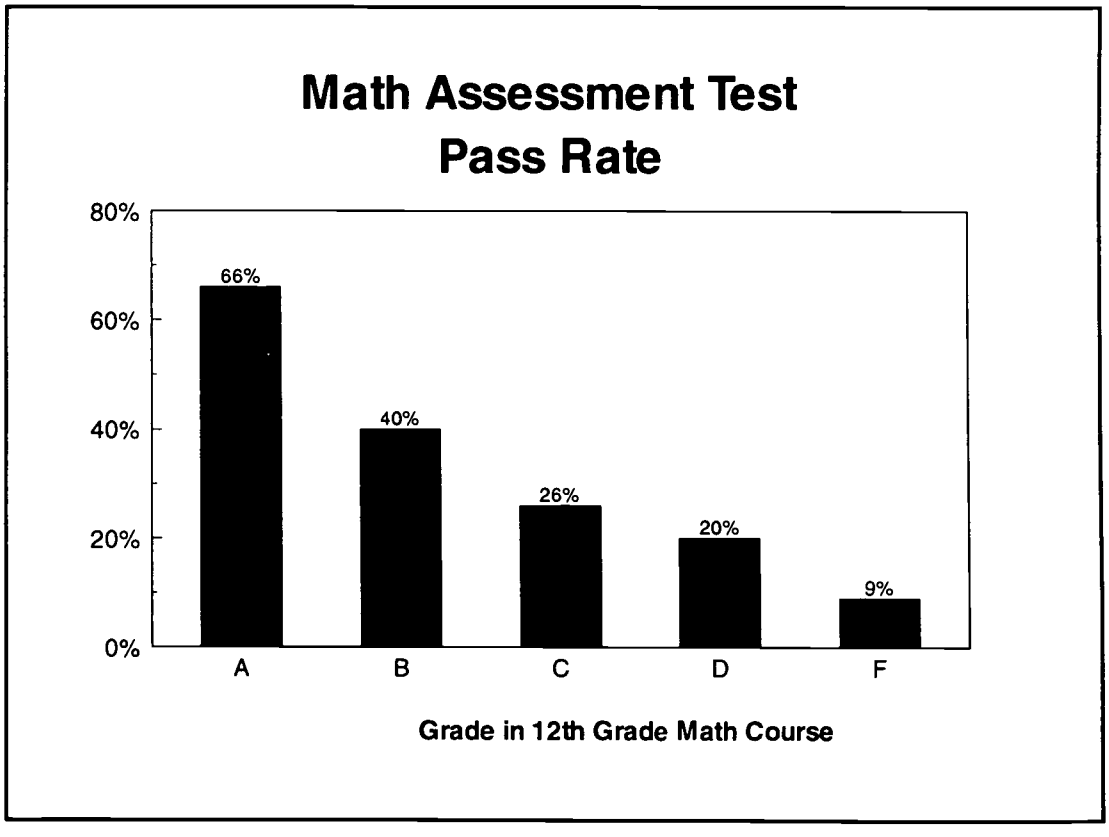
AP Calc.
Pre-Calc.
Stat/Prob.
Algebra III
Algebra II
Geometry
Business Math
12th Grade Math Course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A
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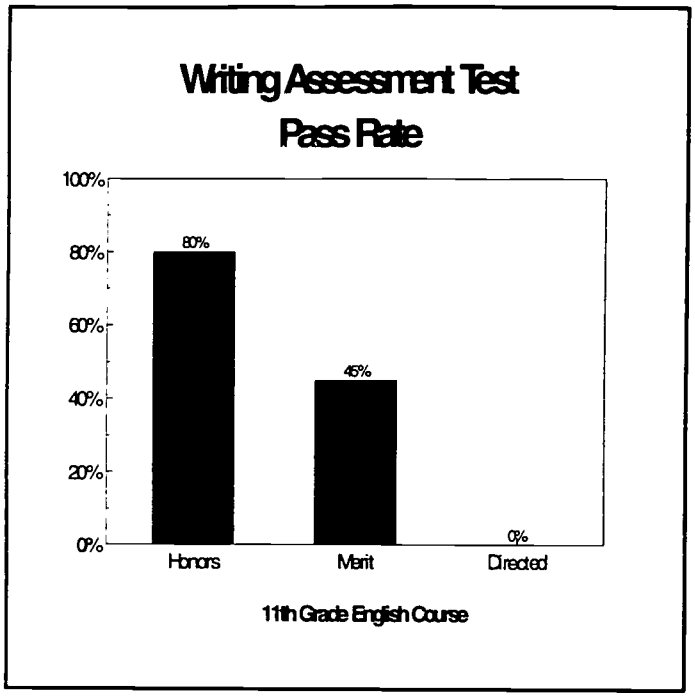
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80%
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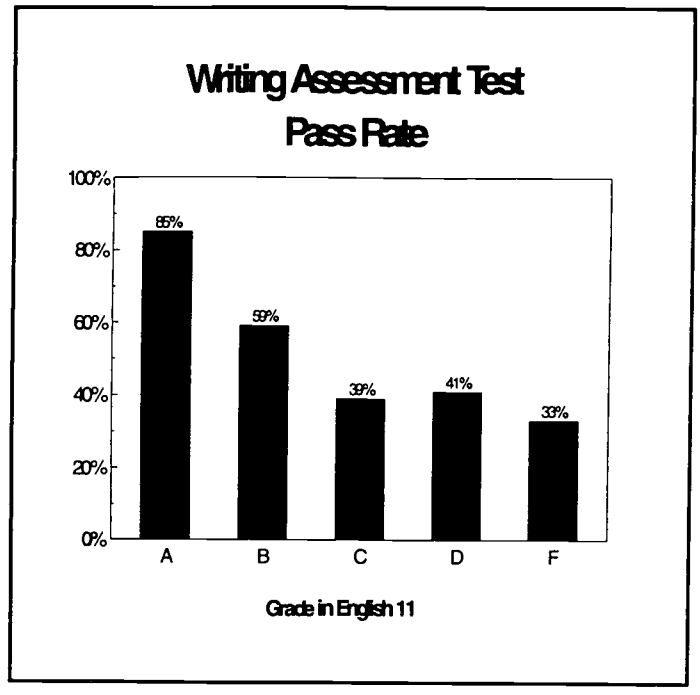
Honors
Merit
Directed
11th Grade English Course


Writing Assessment Test
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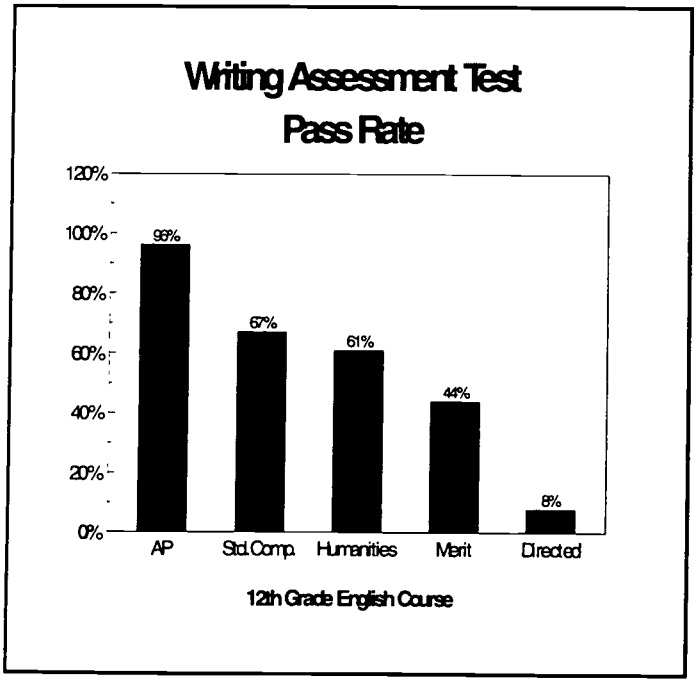
Grade in English 11


Writing Assessment Test
Pass Rate
120%
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80%
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99%
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8%
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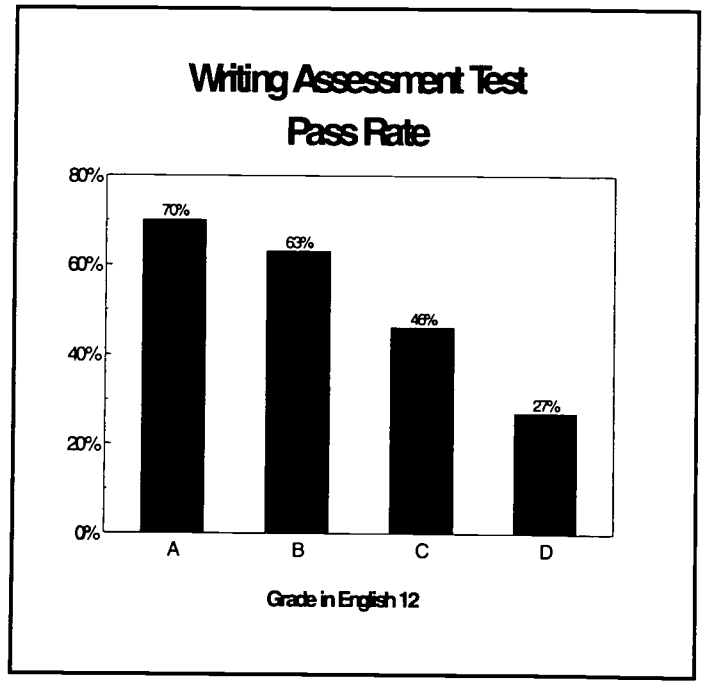
Merit
Directed
12th Grade English Course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46%
27%
A
B
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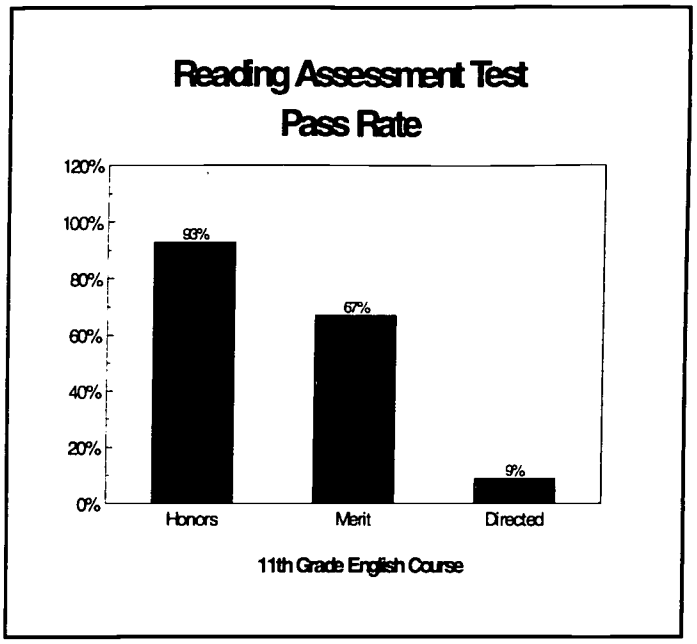
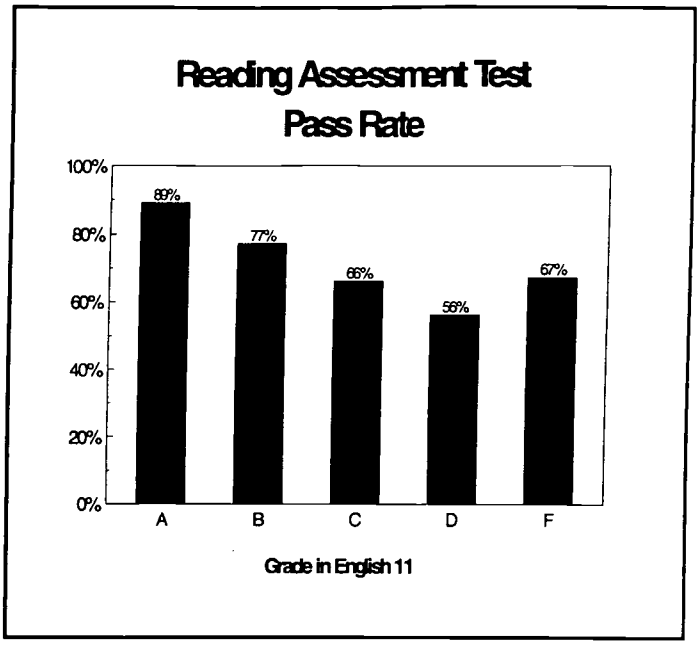
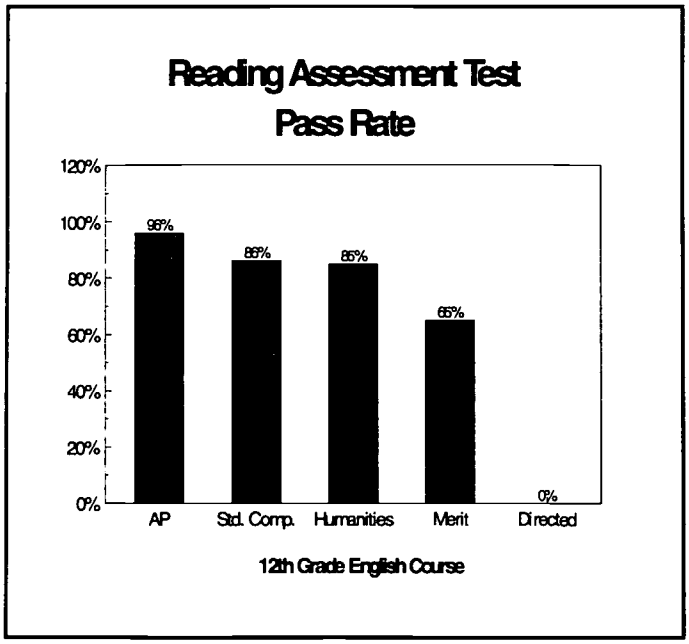
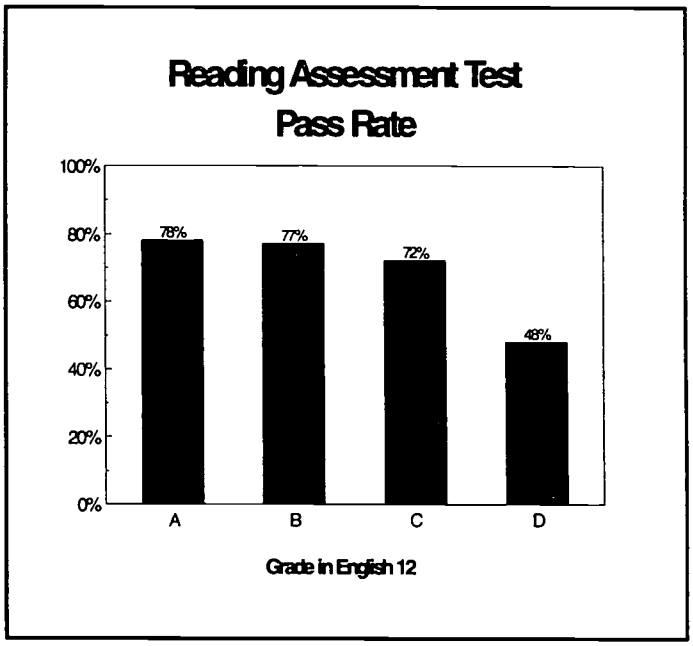
D
Grade in English 12


Reading Assessment Test
Pass Rate
120%
100%
80%
60%
40%
20%
0%
93%
67%
9%
Honors
Merit
Directed
11th Grade English Course


Reading Assessment Test
Pass Rate
100%
80%
60%
40%
20%
0%
89%
77%
66%
56%
67%
A
B
C
D
F
Grade in English 11


Reading Assessment Test
Pass Rate
120%
100%
80%
60%
40%
20%
0%
96%
86%
86%
65%
0%
AP
Std. Comp.
Humanities
Merit
Directed
12th Grade English Course


Reading Assessment Test
Pass Rate
100%
80%
60%
40%
20%
0%
78%
77%
72%
48%
A
B
C
D
Grade in English 12

Grade Distribution by 11th Grade English Level and Performance on FCC Writing Placement Test

	A		B		C		D		F	
11th Grade English Level	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*
Honors	18	1	40	9	18	9	4	2	0	0
Merit	19	4	46	45	23	53	12	19	1	2
Directed	0	2	0	5	0	2	0	2	0	0

Grade Distributions by 12th Grade English Course and Performance on FCC Writing Placement Test

	A		B		C		D		F	
12th Grade English Course	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*
AP English	3	0	14	1	6	0	2	0	0	0
Stud/Comp	9	1	25	9	8	7	1	4	0	0
Humanities	5	2	17	10	13	10	1	2	0	0
Merit	14	8	32	28	24	41	6	21	0	0
Directed	0	2	0	5	1	4	0	0	0	0

Grade Distribution by 11th Grade English Level and Performance on FCC Reading Placement Test

	A		B		C		D		F	
11th Grade English Level	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*
Honors	18	1	45	4	25	2	6	0	0	0
Merit	21	2	65	26	45	31	16	15	2	1
Directed	0	2	1	4	0	2	0	2	0	0

Grade Distribution by 12th Grade English Course and Performance on FCC Reading Placement Test

	A		B		C		D		F	
12th Grade English Course	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*	*Pass*	*Not Pass*
AP English	3	0	15	0	5	1	2	0	0	0
Stud/Comp	9	1	31	3	13	2	2	3	0	0
Humanities	7	0	26	1	17	6	1	2	0	0
Merit	16	14	37	18	47	23	13	6	0	0
Directed	0	2	0	5	0	5	0	0	0	0

Relationship Between Released Time in the 12th Grade and Performance on the FCC Mathematics, Writing, and Reading Placement Tests

Comparisons to performance on the FCC mathematics, writing, and reading placement tests were made using two variables; RELTIME (was the student granted released time during the 12th grade?), and RELPER (if so, how many class periods during the 12th grade year was the student released?). Chi square analysis was again used to determine if observed distributions of the possible outcomes on the FCC placement tests in mathematics, writing, and reading exceeded expected distributions at the $p < .05$ level of confidence.

The analysis showed that there are no significant differences in the observed distributions of students on the FCC placement tests and the expected distributions. We can be 95% certain that all differences observed can be attributed to random chance. In other words, students who are granted released time during their 12th grade year are no more or less likely to require developmental mathematics, writing, or reading at FCC than are students who do not have released time. Also, of the students who have released time, there are no observed significant differences in the need for developmental mathematics, writing, or reading based on the number of periods released.

Released Time Status	No Developmental Mathematics Required	Developmental Mathematics Required	Total
No	24 (31%)	53 (69%)	77
Yes	77 (29%)	191 (71%)	268

**The differences between groups is not significant
$x^2 = .074$, $df = 1$, $p > .05$

Released Time Status	No Developmental Writing Required	Developmental Writing	Total
No	37 (48%)	40 (52%)	77
Yes	150 (56%)	118 (44%)	268

**The differences between groups is not significant
$x^2 = 1.20$, $df = 1$, $p > .05$

Released Time Status	No Developmental Reading Required	Developmental Reading Required	Total
No	54 (70%)	23 (30%)	77
Yes	197 (74%)	71 (26%)	268

**The differences between groups is not significant
$x^2 = .19$, df = 1, $p > .05$

Released Time Periods	No Developmental Mathematics Required	Developmental Mathematics Required	Total
1	21 (35%)	39 (65%)	60
2	22 (39%)	35 (61%)	57
3	12 (24%)	38 (76%)	50
4	16 (21%)	61 (79%)	77
5	4 (31%)	9 (69%)	13
6	0 (0%)	4 (100%)	4

**The differences between groups is not significant
$x^2 = 8.42$, df = 5. $P > .05$

Released Time	No Developmental Writing Required	Developmental Writing Required	Total
1	34 (54%)	29 (46%)	63
2	38 (66%)	20 (34%)	58
3	29 (56%)	23 (44%)	52
4	38 (49%)	40 (51%)	78
5	8 (62%)	5 (38%)	13
6	3 (75%)	1 (25%)	4

**The differences between groups is not significant
$x^2 = 4.66$, df = 5, $p > .05$

Released Time Periods	No Developmental Reading Material	Developmental Reading Material	Total
1	45 (71%)	18 (29%)	63
2	47 (81%)	11 (19%)	58
3	39 (75%)	13 (25%)	52
4	55 (71%)	23 (29%)	78
5	8 (62%)	5 (38%)	13
6	3 (75%)	1 (25%)	4

**The differences between groups is not significant
$x^2 = 3.20$, $df = 5$, $p > .05$

Summary

This study confirms the judgements of many educators who believe that those students who complete rigorous courses in English, social studies, math, science, and foreign language at high levels of achievement have the greatest probability of being prepared for college. To quote Julian Katz, Director of Testing and Accountability with the Frederick County Public Schools, "...the pattern which is emerging seems to support our earlier suspicions that there is no substitute for hard work, (and) good grades..." This study also confirms many of the suspicions of FCC staff regarding the college preparation of FCPS students who complete high school "merit" level courses in English and mathematics courses at grades of "C" or below. It seems clear now that students who fit this pattern in high school (the majority of FCC freshmen) are in serious jeopardy of failing one or more of the FCC placement tests in mathematics, writing, or reading and requiring one or more semesters of remedial courses before attempting credit courses. This study does not support the belief that having released time during the senior contributes to unsuccessful performance on the FCC placement tests.

The significant differences in placement test performance levels between students who completed "honors" and "merit" level English courses with grades of "C" would indicate that the level of academic rigor and the mastery of a set of specific mathematics or language arts skills represented by that grade in the two levels are significantly different. This study would indicate that a grade of "C" in merit level 11th or 12th grade English or Algebra II is not an indication of college readiness as demonstrated on the FCC placement tests for the overwhelming majority of students.

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