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# An Analysis of Colorado Student Remediation Data

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Augenblick, Palaich and Associates (APA) was asked by the Colorado Department of Higher Education (CDHE) to conduct an analysis of available data regarding student remediation in the state in order to better understand how participation in remedial/developmental education affects students attending public colleges and universities in Colorado. To accomplish this task, APA obtained several data sets from CDHE that provided information about individual students, their demographic characteristics, their academic performance before entering college, and their behavior after participating in developmental courses. Below, we summarize what we learned by analyzing this data.

Before we undertook the data analysis, we examined other information about remedial education routinely reported by the Colorado Commission on Higher Education (CCHHE), based on the organization's annual report to the Colorado Legislature (2011 Legislative Report on Remedial Education, dated February 7, 2011). That report noted that nearly 32 percent of recent high school graduates attending college for the first time, and almost 60 percent of adult students, required remediation in at least one subject area.

For students attending two-year public institutions, more than 58 percent of all recent high school graduates required developmental education, with about 46 percent of students participating in a remedial math course, 40 percent of students participating in a remedial writing course, and 29 percent of students participating in a remedial reading course (over 18 percent of such students required developmental courses in all three areas). Females participated in remedial courses at a rate slightly higher than males (60.1 percent vs. 56.3 percent at public two-year colleges and 23.3 percent vs. 17.5 percent at public four-year institutions). Black students had higher participation rates in developmental education than Hispanic students, who in turn had higher participation rates than White students (85.2 percent vs. 70.8 percent vs. 50.6 percent at public two-year colleges and 52.5 percent vs. 36.3 percent vs. 15.6 percent at public four-year institutions).

As reported by CCHHE, students who participate in remedial or developmental education are less likely to return to college, or to graduate from college, as compared to students who do not participate in such courses. First, students do not pass all of the remedial or developmental courses they take. In fact, only about 60 percent of all remedial courses taken are passed. At two-year colleges, 60 percent of the courses were passed, while 26 percent of the courses were failed; in the remaining cases, students either dropped the courses, withdrew from them, or did not complete them. At public four-year institutions, proportions of courses passed and failed were similar to those at two-year institutions.

Second, the proportion of students who re-enrolled in college is higher for students who did not take a remedial or developmental course. At public two-year colleges, 54.3 percent of students assigned to at least one remedial class re-enroll the following year while 55.9 percent

of students not assigned to any remedial classes re-enroll the following year. However, at public four-year institutions, 62.7 percent of students assigned to at least one remedial course re-enroll the following year while 78.5 percent of students not assigned to developmental courses re-enroll the following year.

Third, the proportion of students who graduate from college after participating in a remedial course is lower than the proportion of students who graduate who did not participate in a remedial course. Based on students entering a public two-year college in the Fall of 2007, 16.2 percent of the students who took a remedial course graduated from a two-year college while 29.4 percent of students who did not take a remedial course graduated. Based on students entering a public four-year college or university in the Fall of 2004, 29.7 percent of the students who took a remedial course graduated from a four-year institution within six years of entry while 62.9 percent of students who did not take a remedial course graduated from a four-year institution within six years of entry.

Our analysis of the impact of remedial education on college students focused on public two-year colleges and the relationships between the extent of remediation (none, only one course, and either two courses or more than one course) and re-enrollment at any point after taking a remedial course, earning an associate degree, grade point average (GPA in the final semester of attendance), and ACT score in high school. It should be noted that of all students taking remedial courses, 86.0 percent attended community colleges and of those students taking remedial courses, 67.2 percent took one course, and 22.7 percent took two courses (32.8 percent took two or more courses).

While 70.5 percent of all students in public two-year colleges who took any remedial course re-enrolled at some time, 80.3 percent of the students who took more than one course re-enrolled while only 54.1 percent of the students who took *only one* developmental course did so. A slightly higher percentage of female students who took at least one remedial course re-enrolled as compared to male students (72.8 percent vs. 67.5 percent).

We were interested in the relationship between participation in remedial courses and graduation (receipt of an A.A. degree). While 18.7 percent of all students attending public two-year colleges in Colorado who never took a remedial course earn an associate degree, only 4.6 percent of the students who ever took a remedial course earn an associate degree. This proportion is even lower if students took more than one remedial course (3.6 percent of students who took more than one remedial course earn a degree while 6.3 percent of students who took only one remedial course earn a degree). Females are more likely than males to earn a degree if they took at least one developmental course (5.0 percent for females vs. 4.1 percent for males). White students are more likely to earn a degree after taking at least one remedial

course than Hispanic or Black students (5.9 percent for White students vs. 3.2 percent for Hispanic students vs. 2.8 percent for Black students).

We were also interested in the relationship between participation in developmental courses and academic performance in college (as indicated by the cumulative grade-point average [GPA] of students in their final semester in college, which might be before graduation or before leaving the college). We disaggregated the data so that we could examine average GPA for students who earned an associate degree, with or without participating in remedial courses, with those who did not earn an associate degree, with or without participating in developmental education.

We found that students who participate in remedial courses have lower GPAs than students who do not participate in remedial courses and that the more developmental courses a student takes, the lower the GPA they earn. For example, the highest average GPA (3.22) was earned by students who received an associate degree and did not take any remedial courses while the lowest average GPA (2.34) was earned by students who did not receive an associate degree and took more than one remedial course. For students who did earn an associate degree, the impact of taking remedial courses on average GPA was small – students who took one remedial course had an average GPA of 3.15 while students who took more than one remedial course had an average GPA of 3.09. But for students who did not earn an associate degree, taking one or more remedial courses resulted in a much lower GPA – students who did not earn an associate degree and did not take any developmental courses had an average GPA of 2.90 while students who did not earn an associate degree but took one remedial course had an average GPA of 2.42 (students who took more than one remedial course had an average GPA of 2.34).

The relationships between GPA levels for students of different gender or race are shown in Table 1. The data follow the same patterns described above (GPA is higher for students who earn an associate degree than for those who do not earn an associate degree and GPA is lower for students who take more remedial courses) with female students having higher GPAs than male students, and White students having higher GPAs than Hispanic students, who have higher GPAs than Black students.

Finally, we were interested in the relationships between ACT scores, student demographic characteristics, and remediation. As would be expected, the ACT scores of students who take remedial courses are lower than students who do not take remedial courses although the extent of the difference is very large. On average, the ACT scores of students who have taken a remedial course are about 75 percent as much as those of students who have not taken a remedial course.

The figures in Table 2 show average ACT scores – composite score and scores for English, Reading, Math, and Science – for students who took no remedial courses compared to students who took one or two remedial courses. The highest average ACT score for students not taking remedial courses was in Reading (21.77), which was four percent higher than the lowest average score in English (20.93). As shown in Table 3, regardless of gender or race, students who took remedial courses had lower composite ACT scores than students who did not take remedial courses and students who took two remedial courses had lower composite ACT scores than those who took only one remedial course.

While these data do not suggest that specific ACT scores are associated with a need for remediation, combined with other data presented above, they indicate a logical connection between ACT scores, participation in remedial courses, lower academic performance based on cumulative GPA, and ultimately, attainment of an A.A. degree.

**TABLE 1**  
**AVERAGE CUMULATIVE GRADE-POINT-AVERAGE IN FINAL SEMESTER FOR STUDENTS IN PUBLIC TWO-YEAR COLLEGES BASED ON WHETHER AN ASSOCIATES DEGREE WAS EARNED OR NOT AND THE NUMBER OF REMEDIAL COURSES TAKEN**

Earned A.A. Degree?	Gender		Ethnicity		
	Male	Female	White	Hispanic	Black
<b>Number of Remedial Courses?</b>					
<b>No</b>					
None	2.74	3.02	2.95	2.56	2.44
One	2.27	2.55	2.49	2.23	2.02
More than One	2.19	2.45	2.43	2.22	2.03
<b>Yes</b>					
None	3.12	3.30	3.24	3.12	3.01
One	3.05	3.22	3.17	3.08	3.02
More than One	3.00	3.15	3.12	3.09	2.91

**TABLE 2  
 AVERAGE ACT TEST SCORE FOR  
 COMMUNITY COLLEGE STUDENTS BY  
 ACT TEST AREA AND NUMBER OF  
 REMEDIAL COURSES TAKEN BY  
 STUDENTS**

ACT Test Area	Number of Remedial Courses Taken		
	None	1	2
Composite	21.43	17.94	15.71
English	20.93	17.28	14.21
Reading	21.77	18.53	15.88
Math	21.17	17.22	15.83
Science	21.37	18.32	16.49

**TABLE 3  
 AVERAGE ACT TEST COMPOSITE SCORE  
 FOR COMMUNITY COLLEGE STUDENTS BY  
 DEMOGRAPHIC GROUP AND NUMBER OF  
 REMEDIAL COURSES TAKEN BY STUDENTS**

Demographic Group	Number of Remedial Courses Taken		
	None	1	2
<i>Gender</i>			
Male	21.43	17.77	15.73
Female	21.43	18.09	15.69
<i>Ethnicity</i>			
White	22.07	18.37	16.11
Hispanic	19.69	17.33	15.14
Black	19.08	16.67	14.67