

Study Summary: An Analysis of One State—Two Educational Systems

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The Purpose and Background for the Study

- The primary purpose of the study was to replicate the original study conducted on the 2009 graduating class and reported in *Shining a Light on Remediation* using the same types of data for the 2010 graduating class
- The results presented in *Shining a Light on Remediation* indicated a high degree of congruence between the need for college remediation and performance on pre-collegiate test data.
- Replication with the data from the 2010 graduating class would provide more evidence for the predictive validity of the pre-collegiate data.

Introduction to the Current Study

- The analyses were conducted on the collegiate and pre-collegiate data available for high school graduates from both 2009 and 2010 who entered Colorado colleges and universities the fall after high school graduation.
- At the end of their first year in college they were classified by their colleges into those who needed remediation or those who did not.
- The Colorado Department of Education worked with the Colorado Department of Higher Education to match the college remediation data with each student's middle and high school state assessment data.
- They were matched utilizing the State Assigned Student Identifier (SASID) in a 'backward analysis' that linked them to
 - High School CO-Act Results and state assessment results (CSAP Reading and Math)
 - Earlier (Grade 6 & 8) state assessment results

Methodology

- Initial analyses were conducted to examine the similarity between the two graduating classes in terms of demographics, remediation and pre-collegiate testing information.
- The primary analyses were conducted on pre-collegiate data from random samples of 4500-5000 students from each of the 2009 and 2010 high school graduating classes.
 - A random sample tends to yield a representative sample of a much larger population and allows the use of inferential statistics in analyzing the data collected.
- The random samples were examined separately with a series of logistical regressions to identify what percentage of students could be correctly classified as needing remediation or not based on their high school and middle school test results.

How Similar Were the Graduating Classes?

Colorado College Enrollment 2009 & 2010

Colorado Postsecondary Enrollment 2009 and 2010 Graduating Classes				
Enrollment in Postsecondary Institution	2009	2010	2009 Percentages	2010 Percentages
2-Yr Colorado State Institutions	7,138	6,980	14.2%	13.5%
4-Yr Colorado State Institutions	15,027	14,899	29.9%	28.8%
Colorado Independent Private Universities	521	663	1.0%	1.3%
Not Enrolled in Colorado Postsecondary Institutions	27,599	29,160	54.9%	56.4%
Total	50,285	51,702	100.0%	100.0%

Colorado College Reading Remediation for Graduating Classes 2009 and 2010

Colorado Postsecondary Enrollment	Reading Remediation 2009						
	Pending Results*		Remediation		No Remediation		Total
2-Yr Colorado Public Institution	347	7.0%	1,714	34.6%	2,887	58.3%	4,948
4-Yr Colorado Public Institution	659	4.9%	834	6.2%	12,010	88.9%	13,503
4-Yr Colorado Independent Private	5	1.0%	3	0.6%	493	98.4%	501
Total	1,011	5.3%	2,551	13.5%	15,390	81.2%	18,952

Colorado Postsecondary Enrollment	Reading Remediation 2010						
	Pending Results*		Remediation		No Remediation		Total
2-Yr Colorado Public Institution	253	5.1%	1,652	33.0%	3,094	61.9%	4,999
4-Yr Colorado Public Institution	104	0.7%	965	6.6%	13,564	92.7%	14,633
4-Yr Colorado Independent Private	10	1.8%	6	1.1%	534	97.1%	550
Total	367	1.8%	2,623	13.0%	17,192	85.2%	20,182

* No Test Results

Colorado College Math Remediation for Graduating Classes 2009 and 2010

Colorado Postsecondary Enrollment	Math Remediation 2009						
	Pending Results*		Remediation		No Remediation		Total
	2-Yr Colorado Public Institution	571	11.5%	2,580	52.1%	1,797	36.3%
4-Yr Colorado Public Institution	650	4.8%	2,049	15.2%	10,804	80.0%	13,503
4-Yr Colorado Independent Private	5	1.0%	8	1.6%	488	97.4%	501
Total	1,226	6.5%	4,637	24.5%	13,089	69.1%	18,952

Colorado Postsecondary Enrollment	Math Remediation 2010						
	Pending Results*		Remediation		No Remediation		Total
	2-Yr Colorado Public Institution	501	10.0%	2,652	53.1%	1,846	36.9%
4-Yr Colorado Public Institution	105	0.7%	2,812	19.2%	11,716	80.1%	14,633
4-Yr Colorado Independent Private	10	1.8%	17	3.1%	523	95.1%	550
Total	616	3.1%	5,481	27.2%	14,085	69.8%	20,182

* No Test Results

Reading Remediation by Demographic Groups 2009-2010

Demographic Groups	Reading Remediation 2009				
	Remediation		No Remediation		Total
Male	970	12.9%	6,569	87.1%	7,539
Female	1,123	13.4%	7,282	86.6%	8,405
Native American	20	18.3%	89	81.7%	109
Asian	99	14.1%	604	85.9%	703
Black	234	32.1%	495	67.9%	729
Hispanic	628	29.8%	1,481	70.2%	2,109
White	1,113	9.1%	11,182	90.9%	12,295
Not English Learner	1,699	11.4%	13,252	88.6%	14,951
English Learner	395	39.7%	599	60.3%	994
Not Economically Disadvantaged	1,406	10.3%	12,268	89.7%	13,674
Economically Disadvantaged	687	30.3%	1,581	69.7%	2,268
No Disabilities	1,827	11.9%	13,545	88.1%	15,372
Disabilities	267	46.6%	306	53.4%	573

Demographic Groups	Reading Remediation 2010				
	Remediation		No Remediation		Total
Male	1002	12.0%	7,378	88.0%	8,380
Female	1,149	12.3%	8,160	87.7%	9,309
Native American	18	14.4%	107	85.6%	125
Asian	98	12.2%	708	87.8%	806
Black	277	29.6%	660	70.4%	937
Hispanic	733	28.1%	1,876	71.9%	2,609
White	1026	7.8%	12187	92.2%	13213
Not English Learner	1712	10.4%	14686	89.6%	16398
English Learner	440	34.1%	852	65.9%	1,292
Not Economically Disadvantaged	1387	9.2%	13697	90.8%	15084
Economically Disadvantaged	765	29.4%	1840	70.6%	2605
No Disabilities	1893	11.1%	15210	88.9%	17103
Disabilities	259	44.1%	328	55.9%	587

Summary of Similarities

- The 2010 graduating class was somewhat larger than the 2009 class. However, fewer 2010 graduates enrolled in Colorado postsecondary institutions.
- The two graduating classes were very similar in terms of the numbers of students and proportions of students enrolling in various types of Colorado postsecondary institutions.
- The demographic breakdowns of the two classes were very similar.
- The proportions of students that required reading or math remediation were very similar in both classes.

How Accurate Were the Predicted Classifications from the Analyses of the 2009 and 2010 Graduating Classes?

Graduating Class 2009

Predicted Remediation Classification Based on 11th Grade ACT for Colorado & 10th Grade State Assessment

	Observed		Predicted from 11 th Grade ACT & 10 th Grade CSAP Reading		
			Reading Remediation 2009 Class		Percentage Correct Classification
			Remediation	No Remediation	
Step 1	Reading Remediation 2009	Remediation	1847	206	90.0
		No Remediation	318	2518	88.8
	Summary		2165	2724	89.3

	Observed		Predicted		
			Math Remediation 2009 Class		Percentage Correct Classification
			Remediation	No Remediation	
Step 1	Math Remediation 2009	Remediation	1749	167	91.3
		No Remediation	268	2508	90.3
	Summary		2017	2675	90.7

Graduating Class 2010

11th Grade ACT for Colorado & 10th Grade State Assessment

Observed			Predicted from 11 th Grade ACT & 10 th Grade CSAP Reading		
			Reading Remediation 2010		Percentage Correct Classification
			Remediation	No Remediation	
Step 1	Reading Remediation 2010	Remediation	1907	221	89.6
		No Remediation	330	2855	89.6
	Summary		2237	3076	89.6

Observed			Predicted from 11 th Grade ACT & 10 th Grade CSAP Math		
			Math Remediation 2010		Percentage Correct Classification
			Remediation	No Remediation	
Step 1	Math Remediation 2010	Remediation	1930	218	89.9
		No Remediation	276	2712	90.8
	Summary		2206	2930	90.4

Predicted 2009 Remediation Classification Based on 6th & 8th Grade State Assessment

Observed		Predicted from 6th & 8th Grade CSAP Reading			
		Reading Remediation 2009		Percentage Correct Classification	
		Remediation	No Remediation		
Step 1	Reading Remediation 2009	Remediation	1316	369	78.1
		No Remediation	325	2087	86.5
	Overall Percentage		1641	2456	83.1

Observed		Predicted from 6th & 8th Grade CSAP Math			
		Math Remediation 2009		Percentage Correct Classification	
		Remediation	No Remediation		
Step 1	Math Remediation 2009	Remediation	1223	370	76.8
		No Remediation	300	2035	87.2
	Overall Percentage		1523	2405	82.9

Predicted Remediation Classification Based on 6th & 8th Grade State Assessment

		Predicted from 6th & 8th Grade CSAP			
		Reading			
		Reading Remediation 2010		Percentage Correct	
Remediation	No Remediation				
Step 1	Reading Remediation 2010	Remediation	1357	429	76.0
		No Remediation	320	2416	88.3
	Summary		1641	1677	83.4

		Predicted from 6th & 8th Grade CSAP			
		Math			
		Math Remediation 2010		Percentage Correct	
Remediation	No Remediation				
Step 1	Math Remediation 2010	Remediation	1409	418	77.1
		No Remediation	312	2261	87.9
	Summary		1721	2679	83.4

Predicted 2009 Remediation Classification Based on 6th Grade State Assessment Only

Observed			Predicted from 6th Grade CSAP			
			Reading			Percentage Correct Classification
			Reading Remediation 2009			
			Remediation	No Remediation		
Step 1	Reading Remediation 2009	Remediation	1278	448	74.0	
		No Remediation	345	2103	85.9	
	Overall Percentage				81.0	
Observed			Predicted from 6th Grade CSAP			
			Math			Percentage Correct Classification
			Math Remediation 2009			
			Remediation	No Remediation		
Step 1	Math Remediation 2009	Remediation	1212	429	73.9	
		No Remediation	363	2018	84.8	
	Overall Percentage				80.3	

Predicted 2010 Remediation Classification Based 6th Grade State Assessment

Observed			Predicted		
			Reading Remediation 2010		Percentage Correct Classification
			Remediation	No Remediation	
Step 1	Reading Remediation 2010	Remediation	1330	502	72.6
		No Remediation	388	2377	86.0
Overall Percentage					80.6

Observed			Predicted		
			Math Remediation 2010		Percentage Correct Classification
			Remediation	No Remediation	
Step 1	Math Remediation 2010	Remediation	1366	488	73.7
		No Remediation	352	2246	86.5
Overall Percentage					81.1

Outcomes and Conclusions

- The results show students who needed remediation in their first year of college could have been identified by an examination of their state assessment results from as early as the sixth grade.
- Logistical regression analysis based on high school assessment results using 10th grade CSAP and 11th grade ACT for Colorado correctly classified approximately **90%** of the students who would later need college remediation.
- Logistical regression correctly classified **more than 76%** of students identified based on assessments taken in sixth and eighth grade.
- Logistical regression correctly classified **74%** of students identified based on assessments taken in sixth grade.
- These findings also suggest that strategies to identify academically “lagging” students earlier in the K-12 pipeline, before they enter postsecondary institutions, the workforce, or the military could potentially reduce the amount of remediation needed.