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The Southern Regional Education Board works with states to improve education at every level, from early childhood through doctoral education. A nonprofit, nonpartisan interstate compact based in Atlanta, SREB was created in 1948 by Southern governors and legislators to help leaders in education and government advance education to improve the social and economic life of the region. Member states are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia.

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### Introduction

### The Readiness Imperative

Dickens once wrote, "It was the best of times, it was the worst of times," and this observation seems particularly germane to today's economy. *In America's Divided Recovery*, Carnevale, Jayasundera and Gulish (2016) observed that the economic recovery since the 2008 recession has resulted in a nation of college "haves and have-nots." Of the 11.6 million jobs created since 2008, 11.5 million of them — or 99 percent — have gone to workers with more than a high school education, while those with a high school diploma or less "saw virtually no jobs recovery." Sixty-five percent of American jobs are now held by workers with some postsecondary education. This percentage is bound to increase (Carnevale et al., 2016).

Given the increasing demands for education and training beyond high school, underprepared students are the linchpin to meeting the nation's workforce needs. Despite the best educational reform efforts of states, districts and schools, students' preparedness for education beyond high school is not improving. From 2016 to 2018, the percentage of students meeting at least three of ACT's college readiness benchmarks has remained unchanged at 38 percent (ACT, 2018a). More alarmingly, the percentage of students meeting none of ACT's college readiness benchmarks has risen to 35 percent — a marked increase from 31 percent in 2014 (ACT, 2018a).

According to the Community College Research Center, over 30 states have implemented initiatives to increase student preparedness for postsecondary education during the senior year of high school (Barnett, 2018). Many of these programs are in their initial stages of implementation, while others are well-established. Although many of these initiatives reduce remediation by placing successful students into college-level course work, the need persists to prepare students for postsecondary education *before* they graduate from high school, as underprepared students placed into postsecondary remediation complete their programs of study at significantly lower rates (Bailey, 2009).

### SREB's Ready for College Courses

The Southern Regional Education Board has been working with states to improve college and career readiness for over a decade. Initially, SREB's work began with an examination of state readiness policy frameworks, which led to the publication of SREB's *Essential Elements of State Policy for College Completion* in 2013. However, states rapidly became aware of the need to develop transitional curricula to prepare at-risk students for the rigors of postsecondary course work.

As a result, SREB partnered with curriculum experts and state officials to develop two Ready for College courses: Literacy Ready and Math Ready. These courses were developed beginning in 2013 and piloted during the 2014-15 school year. Both courses were then made available for implementation in 2015-16. Since that time, the courses have been adopted by hundreds of schools around the nation.

Literacy Ready and Math Ready are designed to engage students in challenging activities to increase their critical thinking, problem-solving and communication skills. Both courses assume that a different approach is required to reach underprepared students and give them the foundational skills they need for success beyond high school.

### **Study Overview**

SREB began collecting evidence on the effectiveness of its Ready for College courses in the 2015-16 school year and continuing through 2017-18. SREB designed two quasi-experimental studies — *Literacy Ready – Three Years of Evidence* (Squires, 2019a) and *Math Ready – Three Years of Evidence* (Squires, 2019b) — to analyze evidence in five states (see the Note on Methodology, page 9). This policy brief outlines the results of these two studies and includes key takeaways for schools, districts and states interested in increasing student preparedness for postsecondary education by implementing the Ready for College courses.

For Literacy Ready, SREB collected data from 15 schools in three states, whereas for Math Ready, SREB collected data from 35 schools in five states. Participating schools included rural, suburban and urban schools that varied in size and demographics. Table 1 summarizes student demographics for this study, with entries rounded to the nearest percent.

Table 1: Demographics of Ready for College Students						
Student Demographics	Literacy Ready Students (%)	Math Ready Students (%)				
Gender						
Female	42	54				
Male	58	46				
Race/Ethnicity						
African-American	32	34				
White	58	45				
Hispanic	6	18				
Other Race or Ethnicity	4	3				
Income						
Free- or Reduced-Price Lunch	57	66				
Not Free- or Reduced-Price Lunch	43	34				

This paper examines the impact of Literacy Ready and Math Ready on the following student outcomes: (1) Literacy Ready or Math Ready course performance performance and results from student surveys administered nationwide, (2) performance on the ACT and SAT exams before and after taking the courses, (3) an analysis of outcomes for comparison group students who did not take math during their senior year of high school, (4) ACT performance in schools that implemented the courses for three years, (5) performance on the ACT exam by gender, race and income, and (6) high school graduation rates and college entrance rates. The report spotlights two schools that implemented SREB's Readiness Courses: Fountain Lake Charter High School in Arkansas and Baldwyn High School in Mississippi.

Students with ACT scores higher than 19 are typically considered ready for college and placed into non-remedial courses when they enter postsecondary programs. SREB's Ready for College courses are designed for students who fall a few points below literacy and math readiness benchmarks on state-approved readiness assessments like the ACT or SAT. For its studies of the impact of Literacy Ready and Math Ready, SREB's analyses targeted students from diverse racial and socioeconomic backgrounds whose ACT subject exam scores in English, reading, math and science were less than or equal to 19 (or students whose SAT math scores fell a few points below math readiness benchmarks). However, it is important to note that only 10 percent of underserved students in the United States — such as minorities and students from low-income families — show "strong readiness" for college-level course work by meeting at least three of ACT's college readiness benchmarks (ACT, 2018a).

The majority of African-American and Hispanic students have ACT scores below 19, whereas less than 50 percent of white students fall in this range (ACT, 2018b). In this light, it is still important to examine achievement gaps for students who do not meet college- and career-readiness benchmarks, as any intervention should seek to close or narrow these gaps instead of perpetuating them.

SREB analyzed the ACT subject scores of students in Literacy Ready and Math Ready. For Literacy Ready, SREB examined ACT English and reading exams; for Math Ready, SREB examined ACT math and science exams. SREB also examined student performance on the SAT math exam for a group of eight schools.

### **Course Performance**

Students perform and succeed at a high level in both Literacy Ready and Math Ready. As Table 2 shows, the average numerical grade in Literacy Ready is 81.8, whereas the average numerical grade in Math Ready is 79.9.

Table 2: Student Performance in Literacy Ready and Math Ready							
Course	Numerical Grade Average (%)	Course Grade Point Average (A = 4.0)					
Literacy Ready (N = 389)	81.8	2.8					
Math Ready (N = 1,080)	79.9	2.7					

Source: SREB analyses of Literacy Ready and Math Ready course data.

### **Student and Teacher Surveys**

SREB annually administers surveys to students and teachers who are participating in Literacy Ready or Math Ready. Surveys are used to gather information about students' and teachers' experiences as well as the quality of the course materials. Table 3 offers students' average responses on a 4-point Likert-type scale for selected survey questions from all schools implementing the courses.

Conley's work on college readiness indicates that student self-efficacy is an important aspect of being prepared for postsecondary education (Conley, 2011). The high level at which students in the Ready for College courses reported that they are taking responsibility for their own learning is worth noting; so, too, was their reported perception of preparedness for college course work. Additionally, most students agreed that taking the Ready for College courses impacted the way they learn. Each of these findings is an important outcome for Literacy Ready and Math Ready students, especially when combined with the gains they showed on the ACT and SAT exams.

Teachers responded at a similar level regarding the Ready for College courses' impact on preparing students for college, but they responded at a slightly lower level regarding students taking responsibility for their own learning. Additional information regarding teacher responses can be found in SREB's Literacy Ready and Math Ready study reports (Squires, 2019a, 2019b).

Table 3: Student Survey Responses						
Survey Question	Student Responses					
Literacy Ready (N = 422 students)						
I am taking responsibility for my own learning.	3.2					
Literacy Ready is preparing me for college-level course work.	2.9					
Taking Literacy Ready has impacted the way I learn.	2.8					
Math Ready (N = 1,853 students)						
I am taking responsibility for my own learning.	3.4					
Math Ready is preparing me for college-level course work.	3.0					
Taking Math Ready has impacted the way I learn.	2.9					

Source: Student response data on a 4-point Likert-type scale from SREB Readiness Course surveys collected in 2016-17 and 2017-18.

### **Literacy Ready Student Comment:**

"This course is really helping me get ready for college and teaching me new ways to increase my studying skills."

### Math Ready Student Comment:

"It is easily the best math course I've ever taken."

#### **Literacy Ready Teacher Comment:**

"I feel that Literacy Ready has truly exposed my seniors to how a college class will be."

### Math Ready Teacher Comment:

"Students have told me it's the hardest they have ever worked in a math class... but the most fun they have ever had."

Key Takeaway: Students in both Literacy Ready and Math Ready perform well in the courses and report high levels of self-efficacy.

### Performance on the ACT and SAT Exams

Literacy Ready students made significant gains on ACT's English and reading exams, with the average score increasing by 1.3 points and 1.5 points, respectively, as outlined in Table 4. Among those who showed improvement, the typical gain was 2.7 points on the English exam and 3.2 points on the reading exam. The effect size was moderate for both the ACT English and reading exams.

Math Ready students made significant gains on the ACT math and science exams, with the average score increasing by 0.8 and 1.9 points, respectively. Among those who showed improvement, the typical gain was 2.1 points on the math exam and 3.3 points on the science exam. The effect size was moderate for the ACT math and science exams. For those students who took the SAT math exam, Math Ready students made significant gains. The average score increased by 24.2 points. Among those who showed improvement, the typical gain was 47.3 points. The effect size was moderate on the SAT math exam.

These are important gains, as neither Literacy Ready nor Math Ready can be considered an ACT or SAT prep course, and neither course emphasizes rote memorization of concepts. Instead, SREB's Readiness Courses were designed to build critical thinking skills by engaging students in challenging activities.

	Table 4: ACT and SAT Results for Students in Ready for College Courses										
Exam	Exam	Average ACT Score Before Course	Average ACT Score After Course	Improvement in Points	Percentage of Students Who Improved (%)	Typical Student Improvement in Points	Statistically Significant	Effect Size			
Literacy	ACT English	14.7	16.0	1.3	61	2.7	Yes	0.54			
Ready (N = 142)	ACT Reading	15.4	16.9	1.5	60	3.2	Yes	0.51			
Math Ready	ACT Math	15.9	16.7	0.8	55	2.1	Yes	0.39			
(N = 366)	ACT Science	15.5	17.4	1.9	69	3.3	Yes	0.64			

Source: SREB analyses of ACT scores in 15 high schools for Literacy Ready students and 27 high schools for Math Ready students as well as SAT scores in eight high schools for Math Ready students.

	Table 4: ACT and SAT Results for Students in Ready for College Courses — Continued									
Exam	Exam	Average ACT Score Before Course	Average ACT Score After Course	Improvement in Points	Percentage of Students Who Improved (%)	Typical Student Improvement in Points	Statistically Significant	Effect Size		
Math Ready (N = 127)	SAT Math	412.4	436.6	24.2	69	47.3	Yes	0.52		

Source: SREB analyses of ACT scores in 15 high schools for Literacy Ready students and 27 high schools for Math Ready students as well as SAT scores in eight high schools for Math Ready students.

Key Takeaway: Students in Literacy Ready and Math Ready made significant gains on the ACT and SAT subject exams. Schools that implement SREB's Ready for College courses can improve student preparedness for college-level course work.

### School Spotlight: Fountain Lake Charter High School, Arkansas

Fountain Lake Charter High School is a rural school in Hot Springs, Arkansas, that has a total enrollment of 452 students. The school has implemented both Literacy Ready and Math Ready courses beginning in 2015-16 with great success. Since the implementation of the courses, 39 students have taken Literacy Ready and 168 students have taken Math Ready. As Table 5 shows, students in Literacy Ready improved their scores on ACT's English and reading exams, while Math Ready made gains on ACT's math and science exams. What's more, Fountain Lake Charter High School students who took the Ready for College courses had a 100 percent graduation rate and a college enrollment rate of 60 percent.

Table 5: Results for Literacy Ready and Math Ready Students at Fountain Lake Charter High School							
Fountain Lake Charter High	ACT English Improvement	ACT Reading Improvement	ACT Math Improvement	ACT Science Improvement			
School, Arkansas	2.0	2.0	2.1	2.6			

Source: SREB analysis of Literacy Ready and Math Ready data at Fountain Lake Charter High School.

### Performance in Schools Implementing the Ready for College Courses for Three Years

SREB collected data from six schools that implemented the Ready for College courses over a three-year period beginning in 2015-16. SREB found sustained improvement for both Literacy Ready and Math Ready students. Table 6 contains three-year data from schools implementing the courses.

Table 6: Three-Year Aggregate ACT Data for Literacy Ready and Math Ready								
Ready for College Course	ACT Subject	ACT Average Before Course	ACT Average After Course	Improvement in Points	Statistically Significant	Effect Size		
Literacy Ready	English	14.6	16.2	1.6	Yes	0.74		
(N = 88)	Reading	15.6	16.9	1.3	Yes	0.43		
Math Ready	Math	15.9	16.9	1.0	Yes	0.59		
(N = 207)	Science	15.6	17.4	1.8	Yes	0.67		

Source: SREB analysis of Literacy Ready and Math Ready data.

### Key Takeaway: With proper implementation and support, improvement in student performance at schools offering the Ready for College courses can be sustained.

### Math Ready Students Versus a Comparison Group With No Math During the Senior Year

One of the states participating in this study does not require students to complete four years of math in high school. As such, SREB compared Math Ready students in the state to a demographically similar comparison group of students who did not take math during their senior year and who also retook the ACT. As Table 7 shows, comparison group students had significantly higher ACT math scores before their senior year than Math Ready students. However, students in the comparison group did not show gains on the math portion of the ACT exam when they retook it in their senior year. In fact, the comparison group students' scores decreased slightly. After taking Math Ready, Math Ready students had higher retake ACT scores and made significantly larger gains than students who did not take math and retook the ACT during their senior year.

Table 7: Math Ready Students Versus Comparison Group – Performance on the ACT Math Exam ( <i>N</i> = 71)								
ACT Exam Takers	Average Initial ACT Score	Average Retake ACT Score	Improvement in Points	Percentage of Students Who Improved (%)	Typical Student Improvement in Points	Statistically Significant		
Math Ready Students (n = 51)	16.0	16.8	0.8	59	2.3	Yes		
No Math Senior Year (n = 20)	16.8	16.3	- 0.5	25	2.0	No		

Source: SREB analyses of a comparison group of students who did not take math during their senior year and Math Ready students from the same state.

## Key Takeaway: Math Ready students outperformed students who did not take math during their senior year by a significant margin.

### School Spotlight: Baldwyn High School, Mississippi

Baldwyn High School is a rural school in Baldwyn, Mississippi, that has a total enrollment of 218 students. The school implemented both Literacy Ready and Math Ready courses beginning in 2017-18 and has seen a marked improvement in student achievement. Since the implementation of the courses, 38 students have taken Literacy Ready and 25 students have taken Math Ready. Table 8 shows students in Literacy Ready improved their scores on the ACT English and reading exams, and students in Math Ready made gains on the ACT math and science exams. Furthermore, Baldwyn students who took the Ready for College courses had a graduation rate of 100 percent and a college entrance rate of 81 percent.

Table 8: Results for Literacy Ready and Math Ready from Baldwyn High School							
Baldwyn High	ACT English Improvement	ACT Reading Improvement	ACT Math Improvement	ACT Science Improvement			
School, Mississippi	2.1	2.1	2.6	1.0			

Source: SREB analysis of Literacy Ready and Math Ready data at Baldwyn High School.

### Performance on the ACT Exam by Gender, Race and Income

Achievement gaps on the ACT based on gender, race and income have been well-established. Males typically perform better than females on the math and science exams, whereas females have higher scores on the English and reading exams (Perry, 2016). Low-income students have lower scores than their peers from higher income households (Mattern, Radunzel & Harmston, 2016). African-American and Hispanic students have lower scores than white students (Laird & Gehring, 2016).

Hence, any closing or narrowing of achievement gaps on the ACT math and science exams should be identified as meaningful progress, whereas persistent gaps should be noted.

When examining achievement gaps on the ACT exam by gender, race and income, Tables 9, 10 and 11 indicate that all student groups made gains after taking Literacy Ready and Math Ready, but improvement varied among groups. Significant gaps did not exist based on gender, whereas some gaps did exist based on race and income. Some gaps based on race and income that existed before students took Math Ready were narrowed after they took the course. Achievement gaps varied between districts and states and should be monitored at those levels. For more details, see SREB's *Literacy Ready – Three Years of Evidence* (Squires, 2019a, 2019b).

Table 9: Performance on the ACT Exam by Gender for Students in Ready for College Courses								
ACT Exam	Gains by Female Students	Gains by Male Students	Significant Gap Before Literacy Ready or Math Ready	Significant Gap After Literacy Ready or Math Ready				
English	1.1	1.4	No	No				
Reading	1.9	1.2	No	No				
Math	0.7	0.7	No	No				
Science	1.8	2.0	No	No				

Source: SREB analyses of ACT scores for Literacy Ready and Math Ready students.

Table 10: Performance on the ACT Exam by Race for Students in Ready for College Courses								
ACT Exam	Gains by African-American Students	Gains by Hispanic Students	Gains by White Students	Significant Gap After Literacy Ready or Math Ready	Significant Gaps After Literacy Ready or Math Ready			
English	0.8	Insufficient data*	1.6	No	Yes			
Reading	0.7	Insufficient data*	1.8	No	Yes			
Math	0.4	1.1	0.9	Mixed Results Between Groups	Mixed Results Between Groups			
Science	2.0	2.0	1.7	Mixed Results Between Groups	No			

Source: SREB analyses of ACT scores for Literacy Ready and Math Ready students. For more details, see *Literacy Ready – Three Years of Evidence* and *Math Ready – Three Years of Evidence* (Squires, 2019a, 2019b). \* There were insufficient data to perform statistical analyses for Hispanic Literacy Ready students.

Table 11: Performance on the ACT Exam by Family Income for Students in Ready for College Courses				
ACT Exam	Gains by Free- and Reduced-Price Lunch Students	Gains by Non Free- and Reduced-Price Lunch Students	Significant Gap Before Literacy Ready or Math Ready	Significant Gap After Literacy Ready or Math Ready
English	1.1	1.1	Yes	Yes
Reading	1.1	1.7	No	No
Math	0.7	0.8	Yes	Yes
Science	1.9	1.7	Yes	No

Source: SREB analyses of ACT scores for Literacy Ready and Math Ready students.

# Key Takeaway: Historically, achievement gaps on the ACT exam have been well-established for gender, race and income. After taking SREB's Ready for College courses, all groups showed improvement on the ACT exam, although gains varied between groups.

### **High School Graduation and College Entrance Rates**

SREB collected data on high school graduation rates from each of the participating schools. Overall, Literacy Ready students had a 98 percent graduation rate, whereas Math Ready students had a 97 percent graduation rate. In both cases, the high school graduation rates for students in the Ready for College courses were higher than the rate reported for all students at the participating high schools. This finding warrants further study.

Information on college entrance rates was collected from the six schools that implemented each of the Ready for College courses over the three-year study period starting in 2015-16. Literacy Ready students had a 72 percent college entrance rate at these schools, whereas Math Ready students had a 70 percent college entrance rate. These data suggest that further study is needed of the impact of the Ready for College courses on college entrance.

### Key Takeaway: Data collected on high school graduation and college entrance rates for students in the Ready for College courses are promising and warrant additional study.

### **Summary**

As noted in the Study Overview (see page 1), SREB's sample was limited to a small number of states and only those Literacy Ready or Math Ready students who chose to retake the ACT (or the SAT, for Math Ready students) after completing the courses. As such, this study's findings should be seen as preliminary. However, the data collected over a three-year period indicate that students in the Ready for College courses performed well in the course and reported a high level of self-efficacy. Literacy Ready students made significant gains on the ACT English and reading exams, and Math Ready students improved significantly on the ACT math and science exams as well as the SAT math exam. Schools that implemented the Ready for College courses for three years showed sustained improvements for their students on the ACT exam. When looking at performance on the ACT exam by gender, race and income, all groups showed improvement, but the amount of the improvement varied between groups. The data on high school graduation and college entrance rates are promising. Listed below are key takeaways from these studies, *Literacy Ready – Three Years of Evidence* and *Math Ready – Three Years of Evidence* (Squires, 2019a, 2019b).

### **Key Takeaways**

- 1. Students in both SREB Ready for College courses Literacy Ready and Math Ready perform well in the courses and report high levels of self-efficacy.
- 2. Students in Literacy Ready and Math Ready made significant gains on the ACT and SAT subject exams. Schools implementing the courses can improve student preparedness for college-level course work.
- 3. Math Ready students outperformed students who did not take math during their senior year by a significant margin.
- 4. With proper implementation and support, improvement in student performance at schools offering the Ready for College courses can be sustained.
- 5. Historically, achievement gaps on the ACT exam have been well-established for gender, race and income. After taking SREB's Ready for College courses, all groups showed improvement on the ACT exam, although the gains varied between groups. Achievement gaps vary between regions and should be monitored at the district and state levels.
- 6. Data collected on high school graduation rates and college entrance rates for students in the Ready for College courses are promising and warrant additional study.

Given the rapidly increasing demands for postsecondary education and training to address the nation's workforce needs, high schools and colleges must work together to meet this challenge. SREB's Ready for College courses can help increase the

readiness of high school graduates before they enter college, giving them the foundational skills in literacy and mathematics they need for success in postsecondary education and the workplace.

### **Future Studies**

SREB recommends that additional longitudinal studies be conducted in two areas. First, although evidence regarding the impact of Literacy Ready and Math Ready on high school graduation is limited, further study in this area is merited. Second, the effects on remediation and performance in college should be examined as Literacy Ready and Math Ready students move from high school into postsecondary education.

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#### Note on Methodology

SREB designed two studies, Literacy Ready – Three Years of Evidence and Math Ready – Three Years of Evidence, as quasi-experimental analyses using paired t-tests to measure ACT gains, independent samples t-tests to identify achievement gaps based on gender and income, and an ANOVA test to determine achievement gaps based on race. For the ANOVA, Levene's test was used to test the homogeneity of variances, and Tukey's Honestly Significant Difference test was used for post hoc pairwise tests. To determine the effect size on paired t-tests, Cohen's d was calculated. All statistical tests were set at a 95 percent level of significance. Statistical analyses were not performed on groups with less than 10 students. Throughout this study, the terms significant and statistically significant indicate the application of a statistical test with p < .o.5.