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This issue brief is a condensed version of the ACT research report Comparisons of Student Growth by District Performance and Poverty, by Chrys Dougherty and Teresa Shaw (2017).

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Comparisons of Student Growth by District Performance and Poverty

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Summary

This report looks at student growth in Arkansas school districts disaggregated by district poverty and by the district's performance relative to other districts. Students in grades 4, 8, and 11-12 were classified as On-Track, Off-Track, and Far-Off Track in a given subject based on test scores for their respective grade levels. Districts were also divided into lower-poverty, medium poverty, and high poverty categories.

Our analysis showed that after adjusting for student characteristics, differences in student growth between above- and below-average districts at each poverty level were large enough to be of practical significance—often close to the amount that students typically grow in a year. It is worth exploring what differences in educator practices and community support may be contributing to these sizeable differences.[1]

However, even in above-average districts at every poverty level, the majority of Off-Track and Far-Off-Track students were unable to get On Track between the earlier and the later grade. In many subjects and groups of districts, less than 30% of Off-Track students and less than 10% of Far-Off-Track students were able to get On Track. These statistics underscore the importance of getting students off to a good start in the early grades.

In pursuing district-wide improvement, school district and community leaders should consider four basic approaches: (1) focus on getting students on track in the early grades; (2) collect feedback designed to improve practices; (3) form knowledge-sharing networks among practitioners and researchers; and (4) strengthen out-of-school supports for students and their families.

Introduction

The report used data on four student cohorts for each of grades 4-8 and 8-12 drawn from data supplied by the Arkansas Department of Education for the 2006-07 through the 2013-14 school years.[2] Students were followed longitudinally from four grades earlier (for example, from 4th grade for the 8th grade students) to incorporate test scores from the earlier grade and identify students who were continuously enrolled in the district.

Students were classified as On Track in a given subject in grades 11-12 if they met or exceeded the College Readiness Benchmark for that subject on the ACT.[3] On-Track 8th grade students met the corresponding subject-specific benchmarks on ACT Explore, while On-Track 4th graders met

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subject-specific targets calculated for the Arkansas Benchmark Exam (ABE).[4] In turn, Off-Track students missed the On-Track Level by one standard deviation or less in the grade and subject in question, while Far-Off-Track students scored more than a full standard deviation below the On-Track Level.

In addition, districts were divided into three poverty categories based on their percentage of low-income students, based on student participation in the free and reduced-price lunch program:

- Lower poverty: >20–50% low-income students[5]
- Medium poverty: >50%–70% low-income students
- High poverty: >70% low-income students

Districts were also classified as above-average, average, and below-average in performance in each tested subject in grades 8 and 11-12. This was determined by using statistical models that adjusted for poverty, prior test scores, and other student characteristics in order to accurately and fairly compare districts. Although each district is in the same poverty category throughout, the same district might fall into different performance categories in different subjects and grade levels.

Districts identified as above- or below-average by the statistical models were compared based on five types of statistics in each of grades 8 and 11-12:

- The district performance statistics calculated in the statistical models. These could be thought of as test scores adjusted for student characteristics and prior test scores.
- Changes in (statistically unadjusted) average student scores relative to On-Track targets between the earlier and later grade
- The percentage of On-Track students in the earlier grade who remained On Track in the later grade
- The percentage of Off-Track students in the earlier grade who got On Track in the later grade
- The percentage of Far-Off-Track students in the earlier grade who got On Track in the later grade

Student performance statistics and changes in average scores were expressed in standard deviation units to give them a similar meaning across grade levels using tests with different score scales.

Results

1. Differences in district performance statistics between above- and below-average districts at each poverty level were large, ranging from around half a year's to one and a half years' typical student growth.

In 8th grade, the largest performance difference was 0.35 of a standard deviation between above- and below-average high-poverty districts in science. In grades 11-12, the largest difference was

0.28 of a standard deviation among high-poverty districts in mathematics (first three data columns of Table 1).

These differences may be compared with average growth per year between the ACT Explore and ACT exams of 0.26 standard deviations in English, 0.28 in mathematics, 0.31 in reading, and 0.24 in science (last column of Table 1).[6] In general, these differences ranged from just over a half of a year's typical student growth among medium-poverty districts in reading in grades 11-12 to almost a year and a half's typical growth among high-poverty districts in science.

Table 1. Differences in Performance Statistics between Above- and Below-Average Districts

		Difference in performance statistics			
Grade	Subject	lower-poverty districts	medium-poverty districts	high-poverty districts	comparison: one year's typical growth
8	English	0.23	0.22	0.21	0.26
	Mathematics	0.32	0.31	0.30	0.28
	Reading	0.26	0.26	0.26	0.31
	Science	0.32	0.28	0.35	0.24
11-12	English	0.22	0.22	0.22	0.26
	Mathematics	0.27	0.25	0.28	0.28
	Reading	0.23	0.17	0.21	0.31
	Science	0.22	0.17	0.23	0.24

Changes in statistically unadjusted student scores relative to On-Track targets (not shown here) tell a similar story, with differences often close to a year's typical student growth.

2. Improving the performance of below-average districts to match that of above-average districts would, in many cases, result in many more students On Track. This is less true for previously Far-Off-Track students, who are so far behind that relatively few of them get On Track.

To assess the importance of differences in the percentage of On-Track 4th grade students staying On Track in 8th grade, we simulated how many additional On-Track 4th graders in the below-average districts would have stayed On Track in 8th grade had those districts equaled the percentage of those students staying On Track in above-average districts in the same poverty category. Results are shown in Table 2.

For example, increasing the percentage of 4th grade On-Track students staying On Track in 8th grade mathematics in the below-average lower-poverty districts from 60% to 79% would result in

289 additional students staying On Track. Overall, 628 additional students across the three district poverty categories would remain On Track in mathematics and 360 in reading (Table 2).[7]

Table 2. Percentages of On-Track 4th Grade Students Staying On Track in Grade 8 By District Poverty and Performance

Subject	District poverty category	% staying On Track in above-average districts	% staying On Track in below-average districts	Difference in % staying On Track	Number of prior On-Track students in below-average districts	Simulated additional On-Track students in below-average districts*
Mathematics	Lower	79%	60%	19%	1,484	289
	Medium	76%	56%	20%	1,672	329
	High	70%	59%	11%	87	10
Reading	Lower	77%	64%	13%	1,208	160
	Medium	74%	59%	15%	826	125
	High	72%	43%	28%	265	75

* Equals the number of prior grade On-Track students in the analysis in below-average districts multiplied by the difference in the percentages of those students staying On Track between above- and below-average districts.

A similar story can be told for students who were Off Track in 4th grade: in the simulations (not shown in the table), an additional 625 of those students across the three district poverty categories would get On Track in mathematics and 379 in reading. However, the story is less encouraging for Far-Off-Track students: because relatively few of those students get On Track in any group of districts, the simulations show only 63 additional Far-Off-Track students getting On Track in mathematics and 117 in reading.

3. The percentage of On-Track students staying On Track showed substantial room for improvement.

Comparing performance across subjects, the highest success rates in keeping students On Track were in English. Here, in most groups of districts, 75% or more of students who were On Track in 8th grade stayed On Track in grades 11-12 (Table 3). On the other hand, most groups of districts missed the 75% goal in reading, mathematics, and science. In below-average high-poverty districts, fewer than half of 4th grade On-Track students stayed On Track in reading in 8th grade and less than a third of 8th grade On-Track students stayed On Track in mathematics in grades 11-12 (last column of Table 3).

Table 3. Percentages of Previously On-Track Students Staying On Track in Districts with Different Poverty and Performance Levels*

		Lower-Poverty			Medium-Poverty			High-Poverty		
Grade	Subject	Above average	Average	Below Average	Above average	Average	Below Average	Above average	Average	Below Average
8	Mathematics	79	74	60	76	67	56	70	62	59
	Reading	77	74	64	74	69	59	72	60	43
11–12	English	91	89	79	85	82	80	74	75	62
	Mathematics	79	72	62	71	67	50	67	53	32
	Reading	83	80	63	78	75	68	65	63	NR
	Science	73	69	52	69	62	51	NR	49	NR

*Cells are shaded based on the scenario that a community sets goals that at least 90% (dark blue) or 75% (light blue) of students who were On Track in the earlier grade remain On Track in the current grade.

NR = Not Reported because the calculation is based on a group of fewer than 20 students. Apparent discrepancies in the table are due to rounding.

4. The relatively low percentages of Off-Track and Far-Off-Track students getting On Track underscored the importance of getting more students On Track in the early grades.

In no grade, subject, or group of districts did the majority of earlier-grade Off-Track students get On Track in the later grade, and in most subjects and groups of districts, the percentage of those students getting On Track was less than 30% (Table 4). The percentages were lower for Far-Off-Track students; in most cases, fewer than 10% of those students got On Track (Table 5). On-Track percentages for previously Far-Off-Track students were particularly low in mathematics.

Table 4. Percentages of Previously Off-Track Students Getting On Track in Districts with Different Poverty and Performance Levels*

		Lower-Poverty			Medium-Poverty			High-Poverty		
Grade	Subject	Above average	Average	Below Average	Above average	Average	Below Average	Above average	Average	Below Average
8	Mathematics	38	30	21	35	25	18	20	19	14
	Reading	38	34	28	35	28	20	25	22	13
11–12	English	41	35	23	35	25	25	27	18	9
	Mathematics	31	24	19	22	17	11	16	10	4
	Reading	43	37	24	39	30	18	29	23	15
	Science	26	24	14	25	17	14	10	12	0

*Cells are shaded based on the scenario that a community sets goals that at least 40% (dark blue) or 30% (light blue) of students who were Off Track in the earlier grade get On Track in the current grade.

Table 5. Percentages of Previously Far-Off-Track Students Getting On Track in Districts with Different Poverty and Performance Levels*

		Lower-Poverty			Medium-Poverty			High-Poverty		
Grade	Subject	Above average	Average	Below Average	Above average	Average	Below Average	Above average	Average	Below Average
8	Mathematics	6	5	3	5	3	2	3	3	4
	Reading	10	7	7	9	4	4	6	3	1
11–12	English	30	11	NR	NR	9	NR	4	6	0
	Mathematics	7	4	3	6	3	1	2	1	0
	Reading	18	13	5	13	8	7	11	4	0
	Science	12	9	4	9	6	9	6	3	0

*Cells are shaded based on the scenario that a community sets goals that at least 15% (dark blue) or 10% (light blue) of students who were Far Off Track in the earlier grade get On Track in the current grade.

NR = Not Reported because the calculation is based on a group of fewer than 20 students. Apparent discrepancies in the table are due to rounding.

Promising Improvement Approaches

In general, the results in this report show the importance of getting students On Track in the early grades, given the relatively low percentages of Off-Track and Far-Off-Track students who catch up later. Yet a previous report showed that only two groups of districts—above-average and average lower-poverty districts—got a majority of their 4th graders On Track. Even in those districts, large minorities of 4th grade students were not On Track.[8]

In pursuing district-wide improvement, school district and community leaders should consider four basic approaches (see box, “Three Key Reports on Educational Practices” for additional information):

1. Focus on improvement in the early grades. Gaps in student learning begin in early childhood and are well established by kindergarten.[9] To narrow these gaps, educators can strengthen the early reading and mathematics program, promote better student behaviors and non-academic skills, and teach a content-rich curriculum including science, history/social studies, and the fine arts from early childhood through the elementary grades.[10]

2. Monitor and improve implementation of practices in key areas. These areas should be chosen based on their ability to improve a district’s capacity to address a wide range of problems related to student learning. District leaders should systematically gather information on what practices are actually being implemented and how implementation correlates with gains in student learning, treating teachers and school leaders as partners.[11]

3. Form networks among practitioners and researchers to share learning about improvement. These networks can connect educators in different districts working on the same problem, in addition to connecting educators in different schools in the same district. Creation of these networks can be facilitated by researchers and practitioners in a state education agency, university, regional education laboratory, or nonprofit organization.[12]

4. Work with policymakers and community leaders to strengthen out-of-school supports for students and their families. This approach can be particularly valuable in high-poverty communities, where students face out-of-school challenges that distract them from learning.[13] Strengthening support for students and their families can require better coordination among social service agencies and between social service agencies and schools.[14]

By using these four approaches and keeping track of associations between well-implemented practices and improvements in student outcomes, educators and policymakers can increase their effectiveness in improving student learning.

Three Key Reports on Educational Practices

ACT. (2012). Rising to the Challenge of College and Career Readiness: A Framework for Effective Practices. Iowa City, IA: ACT. (See endnote 1)

Dougherty, C. (2013). College and Career Readiness: The Importance of Early Learning. Iowa City, IA: ACT. (See endnote 10)

Dougherty, C. (2016). Keeping Track of Improvement in Educational Practices. Iowa City, IA: ACT.

(See endnote 11)

Notes

[1] ACT. (2012). *Rising to the challenge of college and career readiness: A framework for effective practices*. Iowa City, IA: ACT. Retrieved from www.act.org/content/dam/act/unsecured/documents/RisingToChallenge.pdf.

[2] These students were enrolled in 202 Arkansas K-12 non-charter school districts in grades 4 and 8 and 169 districts in grades 11-12 that met requirements for having at least 20 continuously enrolled students in the analysis and for having accurate data on the percentage of low-income students based on a comparison with Census data. Because the Census definition of poverty is different from the definition based on free and reduced price lunch eligibility used in education data, a regression analysis was used to identify the relationship between district poverty rates under the two definitions.

[3] The ACT College Readiness Benchmarks, updated in 2013, identify the ACT scores associated with a 50% probability of earning a B or approximately a 75% chance of earning a C in entry-level college courses corresponding to the ACT subject tested (Allen & Sconing, *Using ACT assessment® scores to set benchmarks for college readiness*, 2005; Allen, *Updating the ACT College Readiness Benchmarks*, 2013). In turn, the ACT Explore Benchmarks identify the scores on that test associated with a 50% probability of reaching the Benchmark in the corresponding subject on the ACT (Allen, 2013).

[4] Dougherty, C., Hiserote, L., & Shaw, T. (2014). *Catching up to college and career readiness in Arkansas*. Iowa City, IA: ACT. Retrieved from www.act.org/content/dam/act/unsecured/documents/ACT_RR2014-3.pdf.

[5] Arkansas had no districts with 20% or fewer low-income students.

[6] ACT. (2012). *Principles for measuring growth towards college and career readiness*. Iowa City, IA: ACT. Retrieved from www.act.org/content/dam/act/unsecured/documents/GrowthModelingReport.pdf.

[7] Although these numbers can be added up across groups of districts in the same subject, they cannot be added up across subjects without double-counting students who would change their status in more than one subject.

[8] Dougherty, C. & Shaw, T. (2017). *Comparison of student achievement levels by district performance and poverty*. Iowa City, IA: ACT. Retrieved from http://www.act.org/content/dam/act/unsecured/documents/R1612_Comparisons_of_Student_Achievement_Levels.pdf.

[9] Hart, B., & Risley, T. R. (1995). *Meaningful differences in everyday experience of young American children.* Baltimore, MD: Brookes Publishing; West, J., Denton, K., & Germino-Hausken, E. (2000). *America's kindergartners* (NCES 2000-070). Washington, DC: US Department of Education, National Center for Education Statistics. Retrieved from nces.ed.gov/pubs2000/2000070.pdf.

[10] Dougherty, C. (2013). *College and career readiness: The importance of early learning*. Iowa City, IA: ACT. Retrieved from www.act.org/content/dam/act/unsecured/documents/ImportanceofEarlyLearning.pdf.

[11] Dougherty, C. (2016). *Keeping track of improvement in educational practices*. Iowa City, IA: ACT. Retrieved from www.act.org/content/dam/act/unsecured/documents/5516-insights-keeping-track-of-improvement-in-educational-practices.pdf; Knight, J. (2007). *Instructional coaching: A partnership approach to improving instruction.* Thousand Oaks, CA: Corwin Press.

[12] Bryk, A. S., Gomez, L. M., Grunow, A., & LeMahieu, P. G. (2015). *Learning to improve: How America's schools can get better at getting better*. Cambridge, MA: Harvard Education Press.

[13] Willingham, D. T. (2012). Why does family wealth affect learning? *American Educator*, *36*(1), 33–39. Washington, DC: American Federation of Teachers. Retrieved from www.aft.org/sites/default/files/periodicals/Willingham.pdf.

[14] Broader, Bolder Approach to Education (BBA). (2016). *Case studies: Bright Futures (Pea Ridge, AR)*. Washington, DC: BBA. Retrieved from www.boldapproach.org/case-studies/.