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Kentucky Ranks 33rd on Education Index

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ISSUE BRIEF

on topics affecting Kentucky's economy

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No. 1

Kentucky's educational rank has improved from 48th to 33rd over the past twenty years.

Based only on achievement indicators, Kentucky's rank is 29th.

Despite progress, there is much work remaining to improve education in Kentucky.

Caveats

Kentucky Ranks 33rd on Education Index

By Michael Childress (michael.childress@uky.edu) & Matthew Howell (matthewhowell@uky.edu)

Kentucky's national educational rank has improved dramatically since 1990. Based on multiple educational attainment and achievement factors combined into a single index, Kentucky climbed to 33rd in 2009. This represents a marked improvement from 48th in 1990. The index shows that Kentucky has made educational improvements over the years and gained ground on other states. Only two states that were in the bottom ten in 1990 climbed out of that group with double-digit gains by 2009—Kentucky and North Carolina (see Table 1).

The indicators comprising the index measure educational attainment, such as high school graduation and the dropout rate,¹ as well as educational achievement, including the percentage of students scoring proficient or higher on the various National Assessment of Educational Progress (NAEP) reading, math, and science exams. There are five indicators for 1990 and twelve for 2009 (see Table 2). Both attainment and achievement indicators have trended upward—especially achievement (see Figure 1).²

The Commonwealth has improved its ranking from the bottom of the list to the middle third—demonstrating significant progress. However, there is a substantial achievement and attainment gap between Kentucky and the top ten states—indicating there is still much work ahead. Moreover, while Kentucky has made substantial progress in the achievement levels of primary and secondary students, we still rank well below other states on measures likely to become more important in a high-tech global economy—such as the percentage of adults with a two-year degree and Bachelor's degree or higher. And Kentucky's education leaders and policymakers have highlighted areas that are not strictly attainment or achievement indicators—such as postsecondary retention and the six-year graduation rate—that need to improve if we are to create a more efficient and effective system of P-20 education. Nonetheless, compared to our past and relative to the nation, these data show substantial educational progress.

Although the index provides a good indication of the direction of education in Kentucky, there are at least five caveats to this index. First, as mentioned above, not all of the indicators used in 2009 were available in 1990. Consequently, when making comparisons between years one should be aware of data availability. Second, there are, undoubtedly, fundamentally important indicators not included in the index, such

TABLE 1
The Bottom 10 States in 1990 and Each State's Rank in 2009

	1990	2009
Oklahoma	41	40
West Virginia	42	47
North Carolina	43	32
Tennessee	44	42
South Carolina	45	41
Mississippi	46	50
Arkansas	47	43
Kentucky	48	33
Louisiana	49	49
Alabama	50	46

Source: CBER calculations based on multiple sources

TABLE 2
Selected Education Indicators for Kentucky, 1990, 2009

	1990		2009	
	Value	Rank	Value	Rank
HS Diploma or Higher*	75%	46	87%	42
Two-Year Degree or Higher*	20%	45	34%	44
Bachelor's Degree or Higher*	17%	46	24%	45
9-12th Grade Dropout Rates**	-	-	2.8%	13
ACT State Composite Scores	19.9	43	19.4	49 [†]
8th Grade Math NAEP***	10%	44	27%	38
8th Grade Reading NAEP	-	-	33%	21
8th Grade Science NAEP	-	-	34%	23
4th Grade Math NAEP	-	-	37%	35
4th Grade Reading NAEP	-	-	36%	11
4th Grade Science NAEP	-	-	45%	5
AP Exam Mastery	-	-	11%	30

*Percentage of adults 25 to 64 years old

**2008 data

***The six NAEP indicators show the percentage of students scoring proficient or higher.

[†]In 2008 Kentucky ranked 35th with an ACT of 20.9, but a consequence of all public high school juniors taking the ACT test has been a drop in the state's score.

Note: A dash (-) in a cell indicates that data are not available.

Source: CBER calculations based on multiple data sources



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as those that measure achievement gaps. Third, we give equal weight to each indicator, but, arguably, some indicators are probably more important. However, due to its somewhat subjective nature, any weighting scheme would have its own limitations. Fourth, although rankings are ideal for determining the relative positions of states, they reveal nothing about the distance between states. Knowing that Kentucky is 33rd and Massachusetts is 1st does not reveal how near or far Kentucky is from Massachusetts. Table 3, however, shows how Kentucky's values compare to the average for the top ten states, which is illustrative of how far Kentucky must go before reaching the upper echelon of "smart states." Five, the index is biased toward primary and secondary education with only two of the twelve indicators reflecting postsecondary education outcomes.

Method

The Education Index combines five to twelve education indicators from 1990 to 2009. The index uses summary statistical information about each indicator to construct a number ranging from 0 to 1 that expresses how each state's measure compares to other states. The higher the score, the better a state ranks among the states. The final index score is the average of all available indicator scores for a year. The indicators were standardized by converting them to Z-scores, which allows one to compare and combine them using a common yardstick. The equations are arranged so that a "good" outcome results in a positive Z-score. Then, to generate more intuitive scores, we derive a probability value using a cumulative standard normal distribution. Conceptually, the result represents the percentile ranking of the Z-scores, and indicates the extent to which the state performed well or poorly relative to the other states. For example, using the high school diploma attainment rate, the first step in this method is to calculate the mean and standard deviation across all the states for a particular year. In 2009, Kentucky's high school diploma attainment rate was 87 percent. The mean and standard deviation across all 50 states for that year were 90 percent and 4 percent, respectively. The Z-score was calculated as $(0.90-0.87)/0.04$. The probability value for this Z-score value is 0.15. The education index score was then obtained by repeating this for all available indicators in a given year and then averaging the probability values. Finally, if data are missing for a state other than Kentucky for a given year we either use the average of contiguous years as an estimate or, if that is not available, we use the national average. If data are not available for Kentucky, then that indicator is simply dropped and not used for that year. See the technical appendix for additional information on data sources and the method.³

Notes

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¹Questions about the validity and accuracy of high school graduation and dropout rates have arisen in all 50 states. However, the National Center for Education Statistics (NCES), the source of our dropout data, requires states to adhere to the Common Core of Data (CCD) dropout definition and reporting procedures. Since all states face similar problems in determining an accurate dropout rate and all states adopt a uniform reporting method for the CCD, we believe it is useful and instructive to compare the relative positions of states with respect to their dropout rates. If we exclude the dropout indicator from the index, Kentucky's rank remains at 48 in 1990 and falls to 35 in 2009.

²We use high school diploma, two-year degree, bachelor's degree, and the dropout rate as attainment indicators. The ACT score, all NAEP scores, and AP mastery are achievement indicators.

³Refer to the technical appendix for detailed information on the data sources. Available at <<http://cber.uky.edu>>.

FIGURE 1
Kentucky's Educational Ranking, 1990 to 2009
 (Attainment and Achievement Indices)

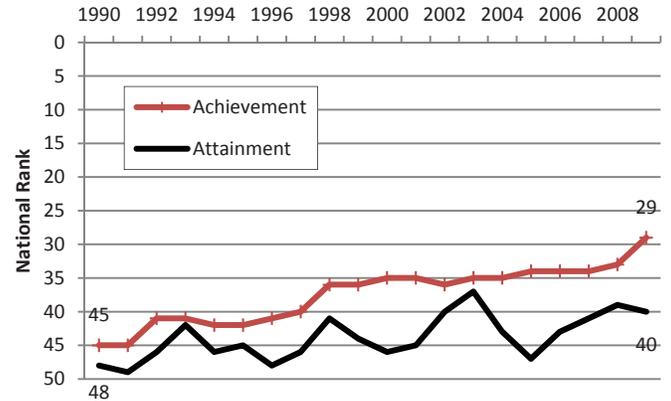


TABLE 3
Comparing Education Indicators for Kentucky,
All States, and the Top 10 States, 2009

Education Indicators	Kentucky	Average for All States*	Average for Top 10 States†
HS Diploma or Higher	87%	90%	93%
Two-Year Degree or Higher	34%	41%	49%
Bachelor's Degree or Higher	24%	31%	38%
9th-12th Grade Dropout Rates	2.8%	4.1%	2.7%
ACT State Composite Scores	19.4	21.6	22.8
8th Grade Math NAEP	27%	34%	43%
8th Grade Reading NAEP	33%	31%	38%
8th Grade Science NAEP	34%	31%	36%
4th Grade Math NAEP	37%	39%	49%
4th Grade Reading NAEP	36%	32%	39%
4th Grade Science NAEP	45%	34%	41%
AP Exam Mastery	11%	14%	18%

*This is the average of the state averages—not the U.S. or a weighted average across the states.
 †The top 10 states based on the education index are (from first to tenth): MA, NH, MN, CT, NJ, VT, VA, ND, WI, and MD.