

Summary Points

- On average, districts report receiving 6 applications per teacher vacancy.
- Teacher supply is unequally distributed across Arkansas.
- District size, urbanicity, and geographic region have the most influence on teacher supply.
- Districts with the most favorable teaching supply include:
 - Districts enrolling more than 3,500 students
 - Urban and suburban districts, and
 - Districts in the Northwest region.
- Beginning teacher salary was not significantly associated with increased teacher supply.

Arkansas Teacher Supply

This brief examines teacher supply in Arkansas. Using survey data collected in Spring 2017 and data publicly available from the Arkansas Department of Education, we examine how teacher supply varies by district, grade level, and subject across the state. In particular, we examine characteristics associated with the most favorable teaching supply.

Introduction

Is Arkansas experiencing a teacher shortage? A ‘shortage’ implies that there are not enough teachers available to students, but Arkansas students have greater access to teachers than their peers across the country. In Arkansas there is one classroom teacher to every 14.3 students, compared the national average of 16.1 students per teacher (NCES).

In addition, there are 81% more licensed teachers than are currently employed in AR public schools. According to Arkansas Department of Education (ADE), there were 33,228 certified teachers employed in Arkansas schools in 2017-18, and 60,317 people in Arkansas with a teaching license of any type as of 2017-18.

Although there are perceptions of a widespread teacher shortage in the U.S., research indicates shortages are specific to certain types of schools and occur in particular subjects. Schools located in rural areas may have greater difficulty attracting teachers, as may schools serving a greater percentage of economically disadvantaged students. Schools paying lower teacher sala-

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ries may have difficulty recruiting and retaining teachers.

Aside from an overall teacher shortage, there could be a shortage of teachers in specific subject areas. Teachers are licensed to teach in specific areas, such as Elementary or Secondary Mathematics, and each school year the Arkansas Department of Education (ADE) identifies content areas faces critical teacher shortages. There were 15 critical shortage subject areas identified for 2018-19.

Art, Family and Consumer Science, Library Media, Mathematics, and Special education have been identified as a critical shortage areas for each of the last five years. In addition, Computer Science has been identified as a shortage area since becoming available in 2015. Persistent shortages over time suggest problems with the way in which shortages are identified and/or the strategies used to address them.

Many factors can influence the lack of alignment between the demand for, and availability of teachers. A more thorough understanding of Arkansas teacher supply will support policies that can effectively address any identified teacher shortage in the state.

Determining Teacher Supply

Arkansas is one of 26 states to examine teacher supply. Statewide information on the number of open teaching positions and associated applications is not available. In Arkansas, there is not a centralized system for posting teacher position vacancies, or for teachers to apply to open teaching positions. In fact, over 46% of Arkansas school districts require applicants to complete paper applications to apply for a teaching position. Like most states, Arkansas’ measure of teacher supply focuses on the number of students enrolled in educator preparation programs, and the number of education program graduates entering the workforce. There are two issues with using this method as the primary measure of supply: 1) it tends to focus on teacher supply statewide and not at the district level; and 2) having an adequate number of new teachers statewide does not mean they are filling positions in districts that need them most, nor does having an overall inadequate state supply reflect surpluses that may still occur in more desirable districts.

The ADE references the decline in the number of enrollees in education preparation programs as particular cause for concern. However, focusing on the overall future supply of teachers does not address current teacher supply realities faced by districts. It is possible there could be a shortage in some regions and subjects but a surplus in others. In fact, some types of districts may face no shortage at all but rather a robust supply of teachers for each job opening.

We use a more intuitive and immediate measure of teacher supply: a ratio of the number of applicants for each open teaching position. This is the first study to define teacher supply in this way. By examining the ratio of applications to vacancies at the district level, we get a more direct, localized, measure of teacher supply and can investigate the relationship district characteristics may have on supply.

To gather information on the number of teaching vacancies and associated applications from school districts, we administered a survey to all districts in the Spring of 2017. Overall, 74% of districts responded and the responders were representative of statewide districts on examined characteristics.

Responses reflect that there were approximately **six applicants for each vacant teaching position**. Districts reported that 16,949 applications were received for the 2,882 teaching positions vacant for the 2016-17 school year. Not every vacancy, however received six applications. We found that some types of districts received a greater number of applications than other districts, and that some content areas were more likely to get applicants than others.

Informed by the literature, we examine the relationship between teacher supply and several district characteristics including: student characteristics, district enrollment, district location, and beginning teacher salary. We also examine the relationship between teacher supply and the grade level and subject area of the vacancy.

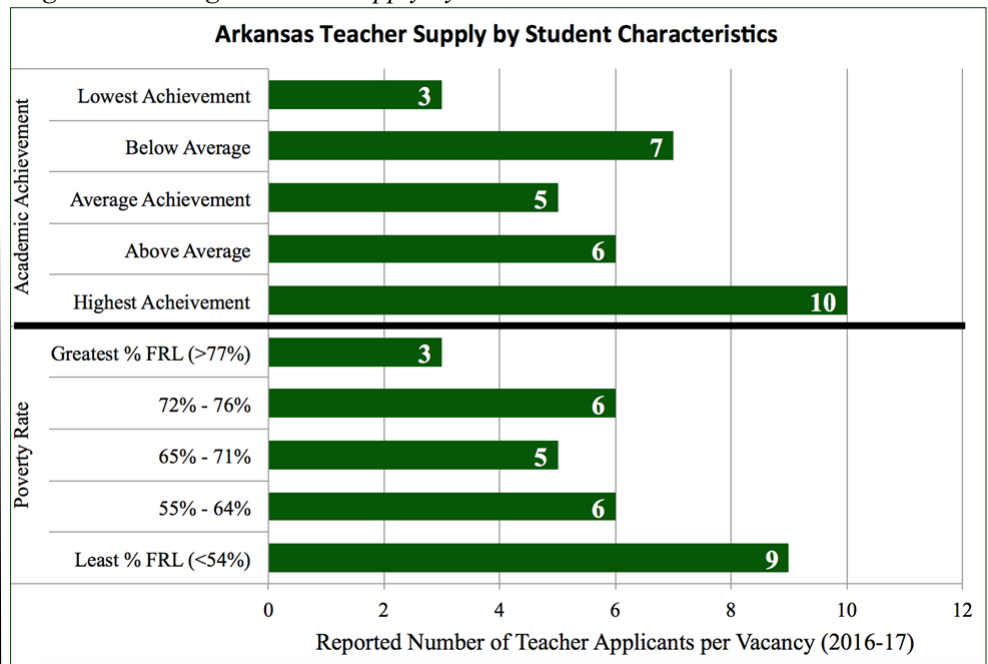
Teacher Supply and Student Characteristics

District Academic Achievement

The educational success indicator uses standardized measures of district percent proficient on the ACT Aspire math and reading assessments (state assessments), district graduation rate, and district average math and reading score on the 11th grade ACT exams. Districts were placed into one of five groups according to educational success indicator score. Using this measure, we examine the extent to which the “overall educational success” of a district is related to teacher supply.

Figure 1 indicates that districts with the highest educational success have almost four times more teacher supply than districts with the lowest educational success. For every vacant position in the highest ‘achieving’ districts, there are an average of nearly 10 applications for the position, while there are fewer than 3 applications per position in the lowest ‘achieving’ districts.

Figure 1: Average Teacher Supply by Student Characteristics



District Poverty Rate

District poverty rate is based on the federal free and reduced price lunch (FRL) status reported by districts. The percentage of students eligible for FRL is used as a proxy for student poverty, and districts were placed into one of five groups according to the percentage of students enrolled in their district that participated in the FRL program. Figure 1 shows that the wealthiest districts have nearly 9 applications per vacant position while the poorest districts have between 2 and 3 applications per vacancy. Poverty is negatively correlated with academic achievement, so many of the districts that were highest achieving are also likely to be lowest poverty.

District Racial/Ethnic Diversity

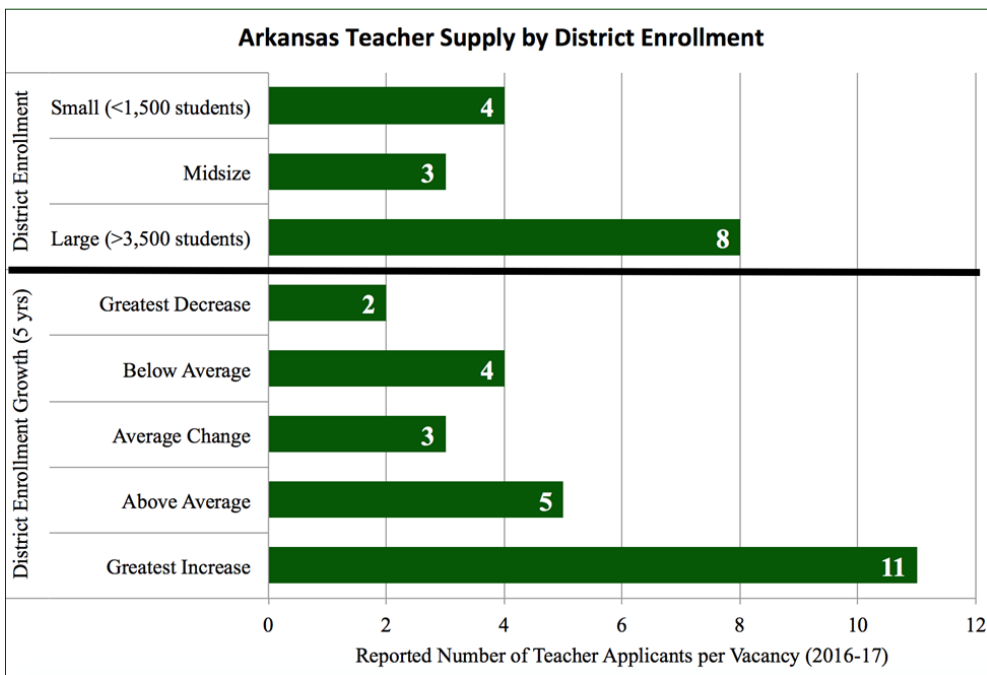
The percentage of district students that identified as white was used as a measure of racial/ethnic diversity, and districts were placed into one of five groups according to the percentage of students enrolled in their district that were white. The applications per vacancy didn't vary much by student racial composition. The least white districts and the whitest districts both have approximately 5 applications for each vacant position, and districts in the other three groups received 7 applications per vacancy. Further analysis indicates that both the whitest and least white districts are also among the smallest districts in the state.

Teacher Supply and District Enrollment

Overall Enrollment

To examine the relationship between district enrollment and teacher supply, we grouped responding districts according to their overall student enrollment. The majority of districts (n=181) were identified as 'Small' districts due to enrolling fewer than 1,500 students. 'Midsize' districts (n=51) had enrollment between 1,500 and 3,500, and the 30 'Large' districts enrolling greater than 3,500 students. Average enrollment among responding districts was 1,821 students in 2016-17.

Figure 2: Average Teacher Supply by District Enrollment



In Figure 2, we see 'large' districts have the greatest supply of teachers. 'Large' districts reported receiving approximately 8 applications for each teacher vacancy. There are fewer than 4 applications per position in small districts and fewer than 3 in midsize districts.

Larger districts are located in cities throughout the state that offer a wider array of resources for housing, entertainment, and employment options. These districts may be more attractive to teachers than smaller, more remote locations.

Change in Enrollment (5 Year)

A district enrollment growth measure was created to account for changes in student enrollment over a 5-year period from 2012-13 to 2016-17, relative to the first year (2012-13). This measure is a reflection of changing demand for teachers based on changes in student enrollment, and ranged from -1.85 to +1.50. Districts were placed into one of five groups according to the magnitude of change in enrollment over the time period examined. Average district growth over five years was 0.69%.

The 35 districts experiencing the greatest enrollment growth over the past five years reported 8,323 applicants for 737 positions. The resulting average of over 11 applications per vacancy was the highest teacher supply of any grouping in this research.

In Figure 2, we see that districts experiencing the greatest declines in enrollment reported only 2 applicants per teacher vacancy. Districts with enrollment growth or decline nearer the state average had between 3 and 5 applicants per vacancy. Growing districts are likely in areas of strong economic development that are attractive locations to teachers.

Teacher Supply and District Location

Region

We use the five education regions designated by the Arkansas Association of Educational Administrators — Northwest, Northeast, Central, Southwest, and Southeast. Districts are associated with one of five groups according to their geographic location. There are 79 districts in the Northwest region, 67 districts in the Northeast region, and 54 districts in the Central region. The Southwest and Southeast regions consist of 38 and 24 districts, respectively.

As can be seen in Figure 3, a vacancy posted in Northwest school districts receives an average of 10 applications for the position, while a vacancy in the Southeast region receives only about 1 application.

The Southeast region districts reported the lowest rates of teacher supply of any grouping in this research.

Urbanicity

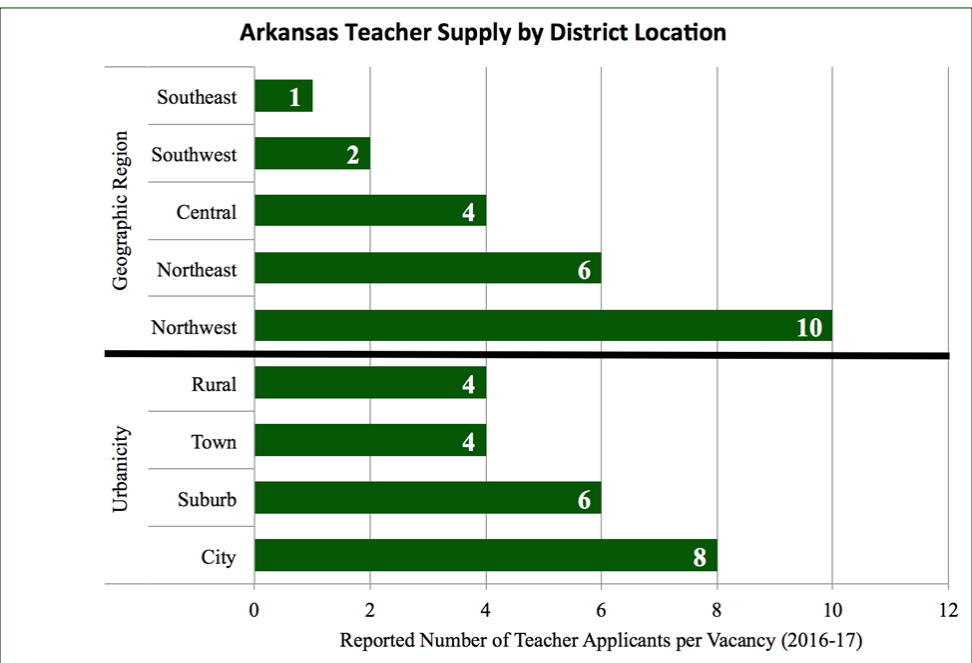
Urbanicity is another way to consider and measure district size, as it is related to the population of a particular area. We use the National Center for Education Statistics (NCES) urban-locale framework, for the four basic urbanicity designations for school districts: ‘City’, ‘Suburb’, ‘Town’, and ‘Rural’.

A “City” is defined as an urban area with a population of around 100,000 or more. Fayetteville School District would be an example of a district designated as “City”, as would the capital city of Little Rock. A “Suburb” is outside a city but still within an urban area. An example of a district designated as “Suburb” would include Farmington School District. A “Town” is approximately 10-35 miles from a city/suburb, and Mountain Home School District would be an example of a “Town” district. “Rural” is

considered at least five miles from a city/suburb and approximately 10 miles from a town. An example of a “Rural” district would include West Fork School District.

In In Figure 3, we see that on average a vacancy in city school districts generates approximately 8 applications for the position, while there are fewer than 4 applications in town and rural districts.

Figure 3: Average Teacher Supply by District Location



Teacher Supply and District Average Teacher Salary

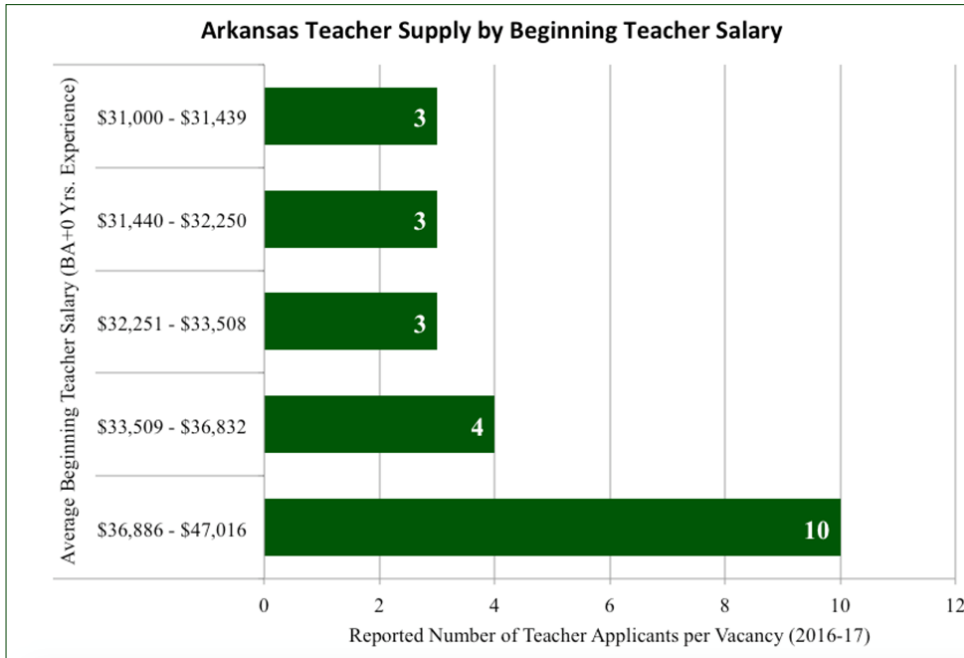
Beginning Teacher Salary

To examine the relationship between teacher salary and teacher supply, we use the district reported beginning teacher salary for those with a Bachelor’s degree and no prior teaching experience. Districts are assigned to one of five salary levels based on the salary offered.

As shown in Figure 4, districts with the highest teacher salary have by far the greatest teacher supply- almost three times more teacher supply than lower paying districts. This means that the highest paying districts have between 9 and 10 applications per vacant position on average while other districts have about 3 applications per vacancy.

It is important to note, however, that there is little variation between the starting salaries in the majority of districts. The Bureau of Legislative research noted in the 2018 Teacher Salary Report that “there is a compression of district minimum salaries, whereby 75% of the districts’ minimums fall within \$31,400 and \$36,138 or a difference of \$4,738”. This research indicates little variation in the number of applicants between the districts whose beginning teacher salaries are fall within that range.

Figure 4: Average Teacher Supply by Beginning Teacher Salary



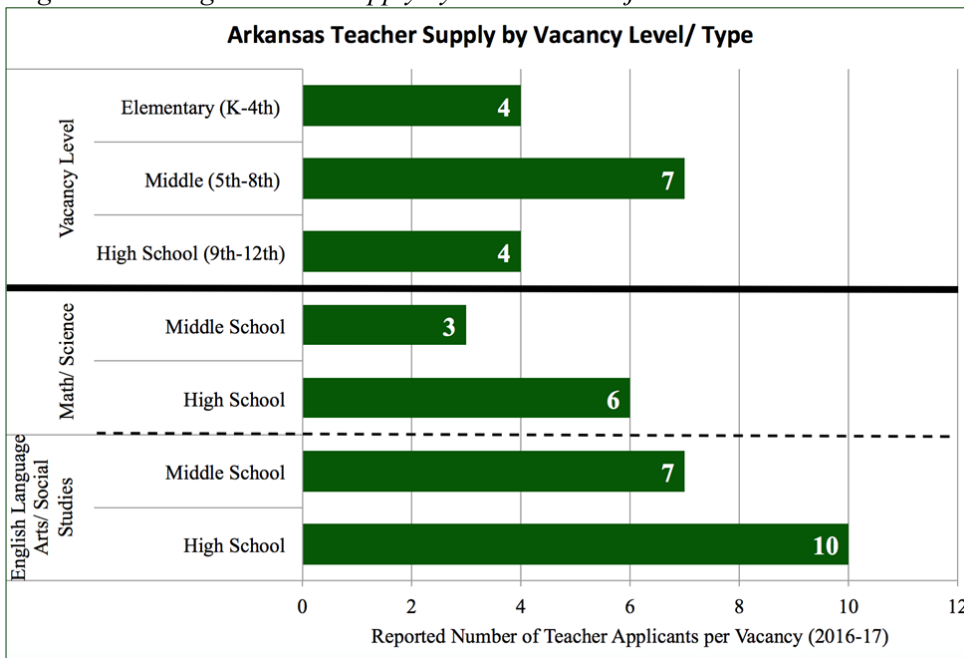
Teacher Supply and Grade Level/ Subject Area

Grade Level

We examine teacher supply by elementary, middle, and high school levels defined by the grades used in the online survey. Teacher supply for elementary includes all applications and vacancies for kindergarten through grade 4, middle school includes those for grades 5 through 8, and high school includes grades 9 through 12. Prior research would indicate find greater teacher supply at the elementary level and more evidence of shortages at the secondary level.

Contrary to expectations, we find greater teacher supply associated with the middle school level (Figure 5). Middle level positions generate 7 applications per vacancy, while elementary and high school report the 5 applications per vacancy.

Figure 5: Average Teacher Supply by Level and Subject



Subject Area

Turning to the relationship between subject area and teacher supply, as expected, we find greater teacher supply associated with English/language arts than with math and science, particularly at the middle school level. The middle school level has a teacher supply advantage over the high school level in these subjects.

For every middle school English/language arts and social studies position there are an average of 10 applications while there are fewer than 3 applications per high school math and science vacancy.

Multiple Regression Analysis

While the relationships between these factors and teacher supply exist in the descriptive analyses presented here, as many factors are correlated with each other (e.g. urban districts found in certain regions of the state, large districts found in urban areas) we use multivariate analysis to disentangle these relationships and provide more information as to what is driving teacher supply.

The multivariate results largely confirm the descriptive results, and the more detailed analyses are presented in the [full report](#). While most indicators in the models move in the predicted direction some do not, perhaps because they share the same variation.

In sum, these models indicate that the key drivers of teacher supply are district size, urbanicity, and geographic region. Large districts, suburban districts, and districts in the NW have the greatest teacher supply advantage. Beginning teacher salary is not found to be significantly related to district teacher supply.

For more information about this Policy Brief and other education issues in Arkansas contact us:

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Summary

The results presented indicate that there is not a uniform teacher shortage across the state, but that teacher supply is unequally distributed. Multivariate analyses are consistent with descriptive findings, and demonstrate that district enrollment, urbanicity, and geographic region have the most influence on teacher supply across Arkansas. In particular, districts that have the most favorable teaching supply are larger districts with enrollments greater than 3,500. Urban and suburban districts, as well as districts in the Northwest appear to have a significant advantage in attracting teachers. Districts that face a greater challenge in attracting teaching supply are those in the Central, Southwest, and Southeast regions, and those in rural areas. Beginning teacher salary is not found to be significantly related to district teacher supply.

Recommendations

The current method Arkansas uses to identify teacher supply focuses more on the overall intended (future) supply, than on the current supply districts experience through the number of applications they receive. Issues related to district level teacher supply may be different from statewide challenges and policies to address them must be considered. Rather than focus on overall supply, Arkansas should consider examining teacher supply at a more localized level and examine ways to better match prospective teachers to positions. To that end, we suggest the following recommendations:

- To better understand how teacher supply is distributed across districts, the state should consider collecting application and vacancy information at the district level.
- To make it easier for applicants to find district vacancies and districts to find applicants, a statewide online application process could be used.
- Starting the hiring process earlier, especially for low-supply districts, could increase both the quantity and quality of candidates.
- Examining ways to purposefully place student teachers in districts, and developing more district-university partnerships where they are limited or may not exist, would also facilitate getting teachers to where they are most needed.
- Expand communication of any incentives available for teachers, especially those in small districts and districts in the Southeast and Southwest regions of the state.

SOURCES

Critical academic shortage areas— Arkansas Dept. of Education, available at http://adecm.arkansas.gov/Attachments/LIC-17-024--17-18_Shortage_Areas_for_CM.pdf
Arkansas method for calculating teacher supply— Arkansas Dept. of Education, available at <https://adedata.arkansas.gov/eppr/docs/State/StatewideReportApril2017.pdf>
Enrollment and demographic data, ACT Aspire data, Grade 11 ACT data, graduation rate data, finance data— Office for Education Policy, available at <http://www.officeforeducationpolicy.org/arkansas-schools-data-benchmark-examinations/>
NCES urban-locale framework— National Center for Education Statistics, Elementary/secondary information system, Arkansas school district urban-centric locale, 2014-15.
Arkansas Education Regions, available at <https://arkansas.schoolspring.com/>
Teacher salary Arkansas Dept. of Education, available at http://www.arkansased.gov/public/userfiles/Fiscal_and_Admin_Services/Publication%20and%20reports/Salary%20Reports/Teacher_Salary_Schedule_Analysis_20162017_revised_3_20_17.pdf
Teacher Salary Report, BLR, Available at <http://www.arkleg.state.ar.us/assembly/2017/Meeting%20Attachments/410/504/Teacher%20Salary%20Report%20REVISED%20062118.pdf>

For additional source information and reference literature, see the Arkansas Education Report, available at <http://www.officeforeducationpolicy.org/arkansas-teacher-supply-2/>