TEACHER QUALIFICATIONS AND PAY
IMPACT ON TEACHER RETENTION AND STUDENT PERFORMANCE

LOUISIANA PUBLIC SCHOOL TEACHERS

PERFORMANCE AUDIT SERVICES
ISSUED MAY 25, 2022

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LOUISIANA LEGISLATIVE AUDITOR
MICHAEL J. "MIKE" WAGUESPACK, CPA

May 25, 2022

The Honorable Patrick Page Cortez,
President of the Senate
The Honorable Clay Schexnayder,
Speaker of the House of Representatives

Dear Senator Cortez and Representative Schexnayder:

This report provides the results of our evaluation of how differences in qualifications, pay, and other attributes affect teacher retention and student performance in Louisiana. We conducted this audit because attracting and retaining a capable teaching workforce is an important part of providing quality education to the state's K-12 student population.

We found that teachers with more years of experience tended to be more effective, and that improvements in their effectiveness generally occurred during the first five years of teaching. The percentage of teachers in their first or second year of teaching who were rated as effective-proficient or highly effective was 42.9%. That percentage increased to 53% after four to five years, and generally remained at that level.

In addition, we found that certified teachers were more effective on average than uncertified teachers. The Louisiana Department of Education's value-added model rated 51.3% of certified teachers effective-proficient or highly effective, compared to 43.4% of uncertified teachers. However, teachers with graduate degrees were not necessarily more effective than teachers with a bachelor's degree only.

We also found that teachers in schools with more economically-disadvantaged students were less likely to be certified and had fewer years of experience. For example, teachers in Orleans Parish were less likely to be certified and had fewer years of experience than teachers in schools in other cities or in less populated areas. The percentage of uncertified teachers was 54% in Orleans Parish schools, versus 12.5% statewide.

Lower rated schools also had fewer certified teachers. At A-rated schools, 5.7% of teachers were uncertified, while 23.8% of teachers at F-rated schools were uncertified.

Teachers in charter schools also were less likely to be certified and had fewer years of experience on average than teachers in traditional public schools. We found that in traditional

public schools, 92.1% of teachers were certified, compared to 50.3% of teachers in charter schools.

We found as well that the state could improve teacher retention by increasing salaries. Our analysis showed that for each additional $1,000 in salary, a teacher would be 0.4 percentage points more likely to remain in the public education workforce.

The state also could improve teacher retention if salaries in areas with high housing costs were higher. Our analysis showed that for each $100 decrease in monthly rents in a given parish, a teacher would be 0.2 percentage points more likely to remain in the public education workforce, holding all other factors constant.

In addition, Louisiana could improve retention by providing retirement benefits to all public school teachers in the state's public retirement systems. We found that teachers who participated in public retirement systems were 2.3 percentage points more likely to continue working in the public education workforce than teachers who did not participate.

I hope this report will benefit you in your legislative decision-making process. We would like to express our appreciation to the Louisiana Department of Education for its assistance during this audit.

Respectfully submitted,

Michael J. "Mike" Waguespack, CPA
Legislative Auditor

MJW/aa

TEACHERRETENTION

Louisiana Legislative Auditor

Michael J. "Mike" Waguespack, CPA

Teacher Qualifications and Pay: Impact on Teacher Retention and Student Performance

May 2022

Audit Control # 40210024

Introduction

We evaluated how differences in teacher qualifications,[1] pay, and other attributes across schools and districts in Louisiana impact teacher retention and student performance. We conducted this audit because attracting and retaining a capable teaching workforce is an important part of providing quality education to the state's K-12 student population, which is in line with the state's commitment to improving academic achievement and educational opportunities for all students. Over academic years (AY) 2018-19 through 2020-21, there were an average of 683,400 students attending public schools across the state. The Louisiana Board of Elementary and Secondary Education (BESE) is responsible for supervising and controlling Louisiana's public elementary, secondary, and special schools, while the Louisiana Department of Education (LDE) administers the programs overseen by BESE. During this time period, the state's 69 school districts and 147 charter schools were responsible for hiring and setting the salaries of 53,836 teachers, according to state law.

> According to the Southern Regional Education Board (SREB), Louisiana teachers earned an average salary of $51,566 during the 2019-20 academic year, which was 6.6% less than the SREB average of $55,205. Louisiana's average teacher salaries were ranked 12th out of 16 SREB states.

Salary plays a key role in recruiting and retaining teachers because it impacts teachers' decisions about where to work by increasing or decreasing the desirability of a particular position. As a result, schools and districts that have higher salaries may be able to hire more highly qualified and experienced teachers than those that offer lower salaries. This is important because research[2] shows that certain attributes of teachers, such as years of experience and certifications[3], may impact the quality of instruction students receive. Exhibit 1 shows average teacher salaries for the Southern Regional Education Board (SREB) states along with the regional and national average in AY 2019-20.

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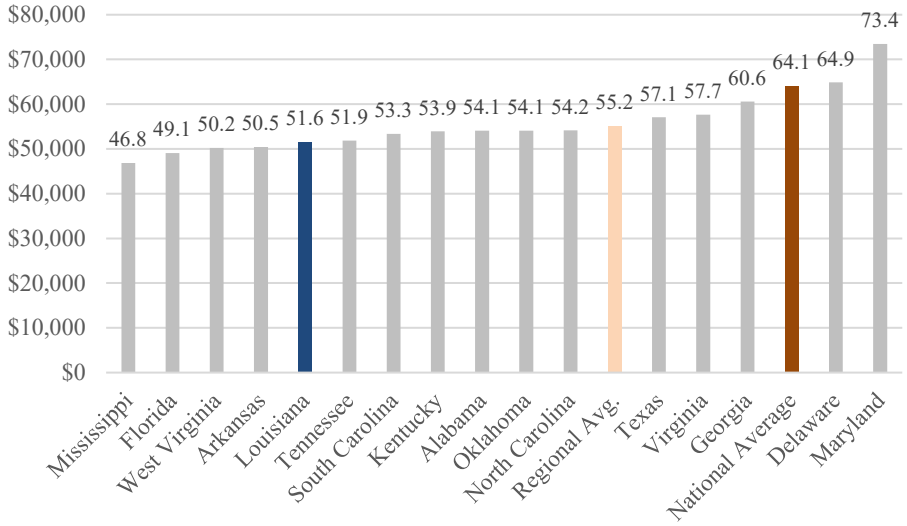
[1] In this report, we use the term "qualifications" to refer to a teacher's education, experience, and teaching certifications.

[2] See Appendix C for sources and summary of our literature review.

[3] La. Admin. Code tit. 28, pt. 131, §101 defines certification as the licensing process whereby qualified professionals become legally authorized to teach or perform designated duties under the jurisdiction of BESE. The policies surrounding certification are designed to identify and support high quality teachers, promote higher standards in the teaching profession and provide for growth and development of the teaching profession. LDE is responsible for implementing and maintaining teacher certification procedures. La. Admin. Code tit. 28, pt. 131, §201 further states that certification shall be a reliable indicator of the minimum current ability and proficiency of a teacher to educate at the grade level and in the subject(s) to which the teacher is assigned.

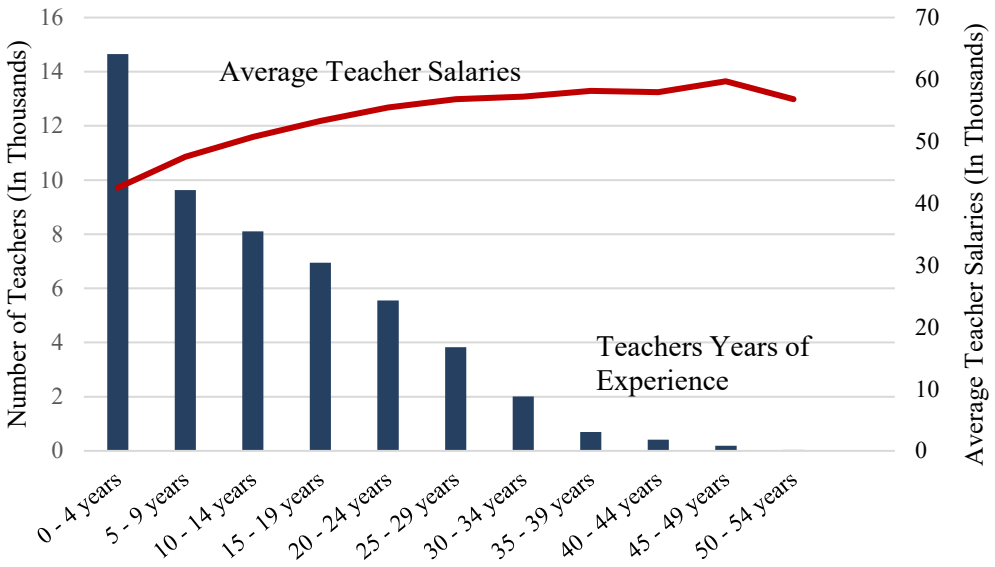
Exhibit 1
Average Salary (All Teachers)
SREB States, Academic Year 2019-20



Source: Prepared by legislative auditor's staff using data from SREB.

Over AYs 2018-19 through 2020-21, Louisiana had 53,836 employees who worked at least some of the year in teaching positions. These teachers had, on average, 12.5 years of experience, 87.5% were certified, and nearly all of them had at least a bachelor's degree with approximately a third also holding graduate degrees. Exhibit 2 below shows the number of teachers and average salaries by years of experience for Louisiana over AYs 2018-19 through 2020-21.

Exhibit 2
Number of Teachers and Average Salaries by Years of Experience
Average of Academic Years 2018-19 through 2020-21



Source: Prepared by legislative auditor's staff using data from LDE.

To conduct this audit, we analyzed[4] peer-reviewed education research, as well as data from LDE showing characteristics of the public education workforce and public schools throughout the state. We used regression analysis to identify teacher characteristics that were associated with improved academic performance among their students and to understand how school and district characteristics relate to teacher pay, retention rates, and other attributes.

The objectives of this audit were to answer the following questions:

1. What teacher qualifications are associated with higher teacher effectiveness in improving student academic performance? ***(pp.6-10)***

2. What types of schools or school districts have more experienced and certified teachers? ***(pp. 11-15)***

3. How can the state better attract and retain an effective teaching workforce? ***(pp. 16-22)***

Our results are summarized on the next page and discussed in detail throughout the remainder of the report. This report has the following appendices:

- Appendix A contains management's response.
- Appendix B provides our scope and methodology.
- Appendix C provides our sources and literature review summary.
- Appendix D provides Value Added Model (VAM) ratings by teacher characteristic.
- Appendix E provides results from our regression analysis of factors that are associated with higher or lower teacher retention rates.
- Appendix F provides the average salary, teacher qualifications, and per student property taxes by district.
- Appendix G provides a map of average teacher salary by school district.
- Appendix H provides average teacher salary by school characteristic.
- Appendix I provides the VAM regression analysis.

[4] A summary of the literature that we reviewed is contained in Appendix C, and the results of our regression analyses are in Appendices E, I, and J.

Executive Summary

Objective 1: What teacher qualifications are associated with higher teacher effectiveness in improving student academic performance?

- Teachers with more years of experience tend to be more effective, and improvements in teacher effectiveness tend to occur during a teacher's first five years of teaching. The percentage of teachers in their first or second year of teaching who were rated as effective-proficient or highly effective, the two highest ratings in LDE's value-added model, was 42.9%, which increases to 53.0% after four to five years, and remains generally the same after that.
- Certified teachers are more effective on average than uncertified teachers. Among uncertified teachers, 43.4% were rated effective-proficient or highly effective, compared to 51.3% of certified teachers.
- Teachers with graduate degrees are not necessarily more effective than teachers that have a bachelor's degree. Unlike certification and experience, teachers with more than a master's degree were less likely to be effective-proficient or highly effective than those teachers with just a bachelor's degree.

Objective 2: What types of schools or school districts have more experienced and certified teachers?

- Teachers in schools serving more economically-disadvantaged students are less likely to be certified and have fewer years of experience.
- Teachers in schools in Orleans Parish are less likely to be certified than teachers in other cities or in less populated areas. The percent of teachers who are uncertified is 54% in Orleans Parish schools,[5] versus 12.5% statewide.
- Lower-rated schools also have fewer certified teachers and teachers with fewer years of experience on average. At A-rated schools, 5.7% of teachers are uncertified, while 23.8% of teachers at F-rated schools are uncertified.
- Teachers in charter schools are less likely to be certified and have fewer years of experience on average than teachers in traditional public schools. In traditional public schools, 92.1% of teachers are certified, while 50.3% of teachers in charter schools are certified.

Objective 3: How can the state better attract and retain an effective teaching workforce?

- The state may be able to improve retention by increasing teacher salaries. For each additional $1,000 in salary, a teacher is 0.4 percentage points more likely to remain in Louisiana's public education workforce.
- The state may be able to improve retention if salaries in areas with high housing costs were higher. For each $100 decrease in monthly rents in a given parish, a teacher is 0.2 percentage points more likely to remain in the state's teaching work force, holding all other factors constant.
- The state may be able to improve retention by providing retirement benefits to public school teachers who do not currently participate in the state's public retirement systems. We found that teachers who participated in public retirement systems were 2.3 percentage points more likely to

[5] This percentage includes teachers at all schools physically located in New Orleans.

continue working in the Louisiana public education workforce than teachers who did not participate.

Objective 1: What teacher qualifications are associated with higher teacher effectiveness in improving student academic performance?

Overall, we found that teachers with more experience and who are certified are likely to be more effective at improving their student's academic performance. According to our analysis, increasing the average years of teacher experience and the percentage of teachers who are certified may improve the effectiveness of Louisiana's teaching workforce and consequently improve the quality of the education that students in the state receive. However, the U.S. Department of Education[6] reported for AY 2017-18 that Louisiana had the fourth-highest rate of teachers in their first or second year of teaching (16.1% in Louisiana, compared to 11.7% nationally), and Louisiana also had the fifth-highest rate of uncertified teachers in the country (9.2%, versus a national average of 3.2%).

We analyzed teacher effectiveness using LDE's value-added model (VAM),[7] which is how LDE estimates the impact a teacher had on a student's academic performance, controlling for factors outside the teacher's control. LDE uses VAM to measure the impact a teacher had on a student's standardized test performance above or beyond what would have been expected for the typical student with the same prior-year test scores, economic status, absences, disciplinary record, and other characteristics outside the teacher's control.[8] Only teachers in the 4th – 8th grades who teach English language arts, math, and social studies, as well as teachers of Algebra I, Geometry, English I, and English II, receive VAM ratings. As a result, 19.7% of teachers had VAM scores for AY 2018-19.[9] We used LDE's VAM ratings to determine whether experience and certification status were positively correlated with teacher effectiveness. LDE assigns teachers to one of four VAM categories based on their raw VAM score, as shown in Exhibit 3.

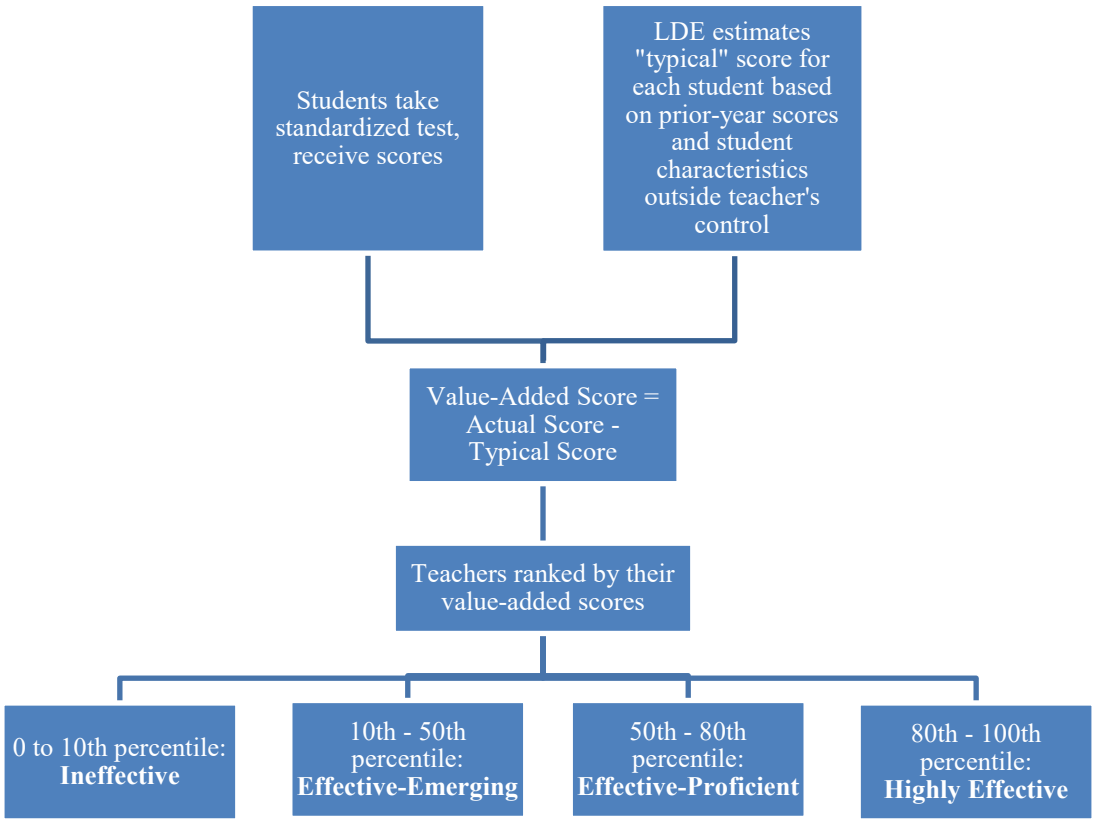
[6] The Office of Civil Rights Data Collection for 2017-18. https://ocrdata.ed.gov/estimations/2017-2018.

[7] According to the National Education Policy Center, 15 states (including Louisiana) were using VAM to make teacher personnel decisions in 2018. The American Statistical Association (https://www.amstat.org/asa/files/pdfs/POL-ASAVAM-Statement.pdf) and American Educational Research Association (https://www.aera.net/Newsroom/News-Releases-and-Statements/AERA-Issues-Statement-on-the-Use-of-Value-Added-Models-in-Evaluation-of-Educators-and-Educator-Preparation-Programs) issued statements in 2014 and 2015 noting the limitations of VAM and providing guidance for using VAM as a basis for teacher pay, promotion, dismissal, and other personnel decisions. We used VAM scores in our analysis solely as a means of identifying trends and averages across broad segments of teachers, and not to assess the effectiveness of any individual teacher in isolation or to recommend any specific personnel actions.

[8] Specifically, VAM compares each student's actual test score to a "typical" test score, which is based on a regression model. The model predicts how well a student would typically do who had the same prior-year test scores, economically disadvantaged status, limited English proficiency status, special education status, and disciplinary and attendance record. The difference between the actual measured achievement and students' typical achievement is the teacher's value added.

[9] Due to the COVID-19 pandemic, VAM scores were not calculated for AYs 2019-20 and 2020-21.

Exhibit 3
Explanation of LDE's Value-Added Model (VAM)

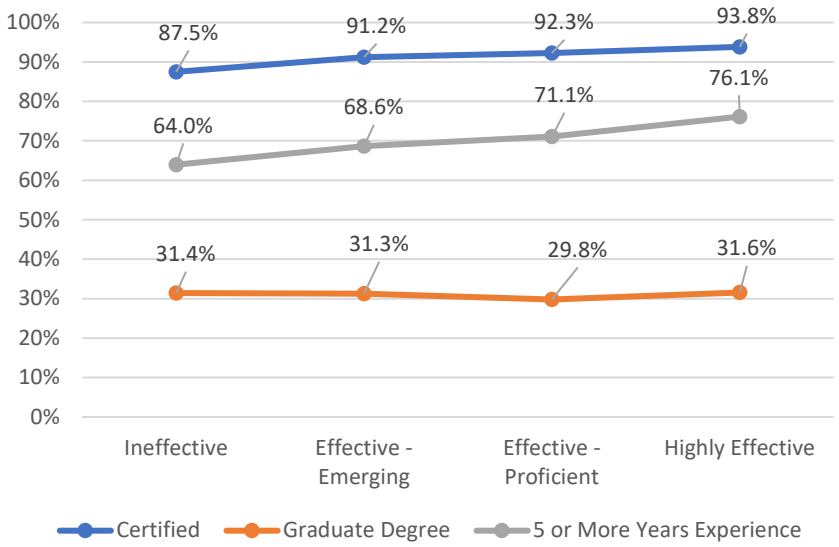


Source: Prepared by legislative auditor's staff using information from LDE.

Research[10] on teacher effectiveness has generally found that teachers with more experience and who are certified are more effective than those who are less experienced or uncertified. Exhibit 4 shows the percentage of teachers with at least five years of teaching experience, teaching certifications, and graduate degrees for teachers in each of the four categories of effectiveness based on VAM ratings. As shown in the exhibit, the percentage of teachers who are certified and the percent who have at least five years of experience increase as VAM ratings improve. The percentage of teachers with graduate degrees does not have a consistent relationship with effectiveness.

[10] See Appendix C for sources and summary of our literature review.

Exhibit 4
Certifications, Experience, and Graduate Degree Attainment by VAM Score
Academic Year 2018-19

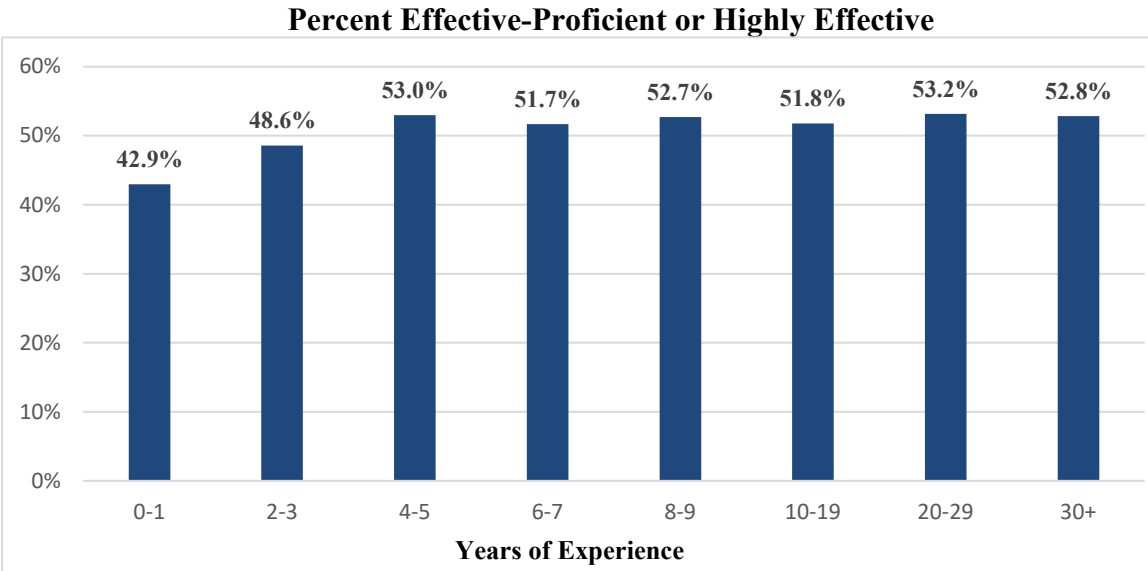


Source: Prepared by legislative auditor's staff using data from LDE.

Teachers with more years of experience tend to be more effective, and improvements in teacher effectiveness tend to occur during a teacher's first five years of teaching. As with certification, literature about teacher effectiveness and our analysis found that more experienced teachers tend to be more effective.[11] Exhibit 5 shows the percentage of teachers rated as effective-proficient or highly effective, the two highest ratings in LDE's VAM ratings, for AY 2018-19. As shown in Exhibit 5, the percentage of teachers in their first or second year of teaching who were rated as effective-proficient or highly effective was 42.9%. This increases to 53.0% after four to five years of teaching but remains relatively the same after that. According to LDE, there are more professional development opportunities for early career teachers than mid-career teachers, so the agency is working to improve professional development opportunities after year five so that teachers can continue to gain effectiveness as they progress past their fifth year of teaching. In addition, LDE provides funding for school districts through its School Improvement Best Practices program to encourage teacher collaboration and career support.

[11] See Appendix C for sources and summary of our literature review.

Exhibit 5
VAM Ratings by Teacher Years of Experience
Academic Year 2018-19

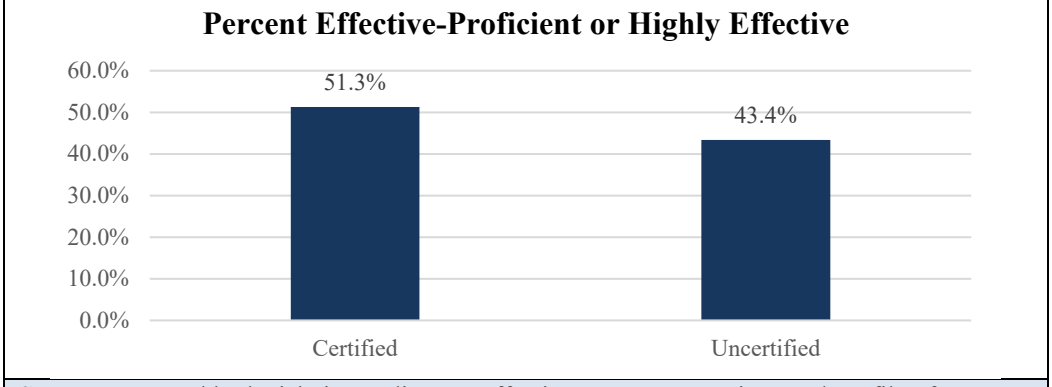


Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

Certified teachers are more effective on average than uncertified teachers. State law[12] requires traditional public school teachers to be certified to teach in Louisiana, although districts can still hire uncertified teachers through nonstandard teaching authorizations if certain criteria are met, and 7.9% of traditional public school teachers are not certified.[13] Exhibit 6 shows teachers' VAM ratings by certification status. Among uncertified teachers, 43.4% were rated effective proficient or highly effective, compared to 51.3% of certified teachers. In addition, among uncertified teachers, 15.1% were rated ineffective, compared to 9.6% of certified teachers. Conversely, 15.1% of uncertified teachers were rated as highly effective, compared to 20.8% of certified teachers.[14]

[12] Louisiana Revised Statute (LRS) 17:7.1
[13] BESE Bulletin 746, Chapter3, Subchapter B provides for Nonstandard Teaching Authorizations and the corresponding criteria.
[14] See Appendix D for percentage of teachers in each of the four VAM ratings by teacher characteristic.

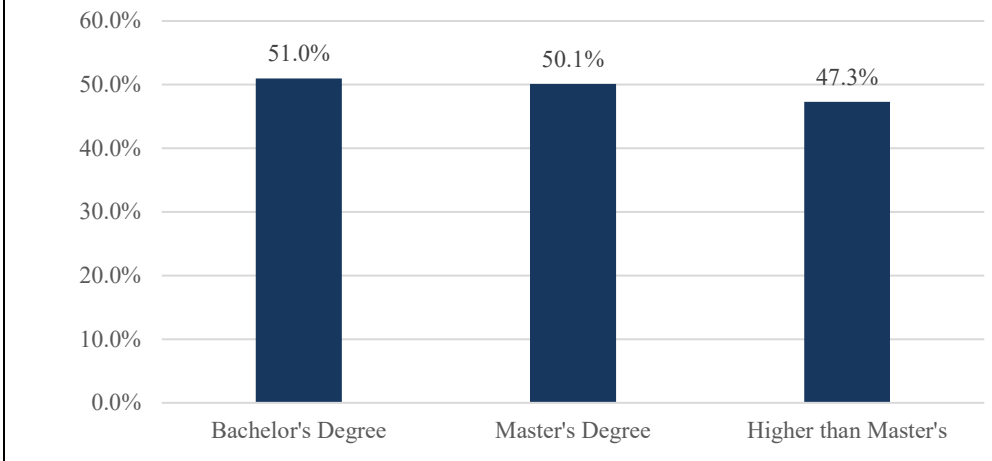
Exhibit 6
VAM Ratings by Teacher Certification Status
Academic Year 2018-19



Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

Teachers with graduate degrees are not necessarily more effective than teachers that have a bachelor's degree. Unlike certification and experience, Exhibit 7 shows that during the 2018-2019 academic year, teachers with more than a master's degree[15] were less likely to be effective-proficient or highly effective than those teachers with just a bachelor's degree for teachers who received a VAM score.[16]

Exhibit 7
VAM Ratings by Teacher Degree Attainment
Academic Year 2018-19



Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

[15] LDE's data did not denote what field the graduate degrees are in.
[16] As noted previously, only teachers in the 4th – 8th grade who teach English language arts, math, and social studies, as well as teachers of Algebra I, Geometry, English I, and English II, receive VAM ratings.

Objective 2: What types of schools or school districts have more experienced and certified teachers?

We found that teacher experience and certification status, which are associated with higher teacher effectiveness, are not consistent across all school districts in Louisiana. Students in better rated schools,[17] wealthier schools, schools outside of major cities, and traditional public schools (as opposed to charter schools) had access to more experienced teachers who were more likely to be certified than students in other schools. More effective teachers impact the academic performance of students, and comparing the qualifications of teachers in different segments of the state's education system may help to identify schools that have a shortage of highly qualified teachers.

Teachers in schools serving more economically-disadvantaged students are less likely to be certified and have fewer years of experience. Poverty is associated with poor academic performance,[18] and economically-disadvantaged students may benefit from more experienced teachers. Teachers in schools in the quintile with the most economically disadvantaged students, where more than 90% are considered economically disadvantaged, have an average of 2.9 fewer years of experience than teachers in the schools in the quintile with the least economically-disadvantaged students. Also, the teachers in the most-economically-disadvantaged quintile are 21.6 percentage points less likely to be certified than teachers in the least economically disadvantaged quintile. This means that the most-economically-disadvantaged students in the state have, on average, the least-experienced teachers and the highest rate of uncertified teachers. According to LDE, school districts can provide differentiated compensation to teachers to encourage them to teach at schools with more economically-disadvantaged students, but not all districts use this authority. Exhibit 8 shows average years of teacher experience and certification status by schools' percent of economically-disadvantaged students.

[17] Using LDE's rating system, which assigns schools a letter grade between A and F, based on performance in several areas including student standardized test scores. Charter schools that have recently been taken over by a different charter school operator due to poor performance may receive a letter grade of T in the initial years following the operator change.

[18] Lacourl, Misty and Tissington, Laura D. 2011. "The effects of poverty on academic achievement." Educational Research and Reviews, Vol. 6(7), pp. 522-527. Hair, Nicole, et al. 2015. "Association of child poverty, brain development, and academic achievement." JAMA Pediatrics, Vol. 169(9), pp. 822-829

Exhibit 8
Average Years of Teacher Experience and Certification by Schools' Percent of Economically Disadvantaged Students
Average of Academic Years 2018-19 through 2020-21

Economically Disadvantaged Quintile of School	Percentage of Students Economically Disadvantaged at School	Average Years of Teacher Experience	Percent of Teachers who are Uncertified	Number of Teachers
Top Quintile (Least Economically Disadvantaged)	<58.5%	13.6	4.2%	13,356
Second Quintile	58.6%-71.6%	13.1	7.7%	11,150
Third Quintile	71.7%-82.9%	12.6	12.3%	10,208
Fourth Quintile	83.0%-92.3%	11.7	17.5%	9,891
Bottom Quintile (Most Economically Disadvantaged)	>92.3%	10.7	25.8%	8,652
Not Available*	N/A	15.5	13.7%	579
Total		**12.5**	**12.5%**	**53,836**

*Schools and other sites for which economically disadvantaged information was not available.
Source: Prepared by legislative auditor's staff using PEP and SPS data from LDE.

Teachers in schools in Orleans Parish are less likely to be certified and have fewer years of experience than teachers in schools in other cities[19] or in less populated areas. On average, teachers in schools in Orleans Parish have the fewest years of experience and are the least likely to be certified as compared to teachers in other cities or in suburban, town, or rural schools. There is a pronounced gap in certification rates between teachers in Orleans Parish schools and teachers in schools in less urbanized areas – the percent of teachers who are uncertified is 54.0% in Orleans Parish schools,[20] versus 12.5% statewide. Exhibit 9 shows teachers' years of experience by schools' urbanization level.

[19] City is defined by the National Center for Education Statistics (NCES) as an area within an urbanized area and a principal city. The NCES primarily uses population density definitions from the US Census Bureau, which states that an urbanized area is a statistical geographic entity consisting of densely settled census tracts and blocks and adjacent densely settled territory that together contain at least 50,000 people. The NCES defines a principal cities as incorporated places with a large population of residents and workers located within a metropolitan or micropolitan statistical area.

[20] This percentage includes teachers at all schools physically located in New Orleans.

Exhibit 9 Average Teachers Years of Experience by Schools' Urbanization Level Average of Academic Years 2018-19 through 2020-21			
Urbanization Level	**Average Years of Teacher Experience**	**Percent of Teachers who are Uncertified**	**Number of Teachers**
City-Outside New Orleans	12.5	10.9%	11,894
City-New Orleans	8.6	54.0%	3,727
Suburb	12.3	8.4%	15,745
Town	13.2	11.2%	6,697
Rural	13.1	8.1%	14,523
Not Available*	16.0	12.3%	1,250
Total	**12.5**	**12.5%**	**53,836**
*Schools and other sites for which urbanization data is not available. **Source**: Prepared by legislative auditor's staff using PEP and enrollment data from LDE.			

Lower-rated schools have fewer certified teachers and teachers with fewer years of experience on average. LRS 17:7(6)(a)(i) directs BESE to develop teacher certification requirements to ensure that teacher certification shall be a reliable indicator of minimum current ability and proficiency of the teacher to educate at the grade level and in the subject(s) to which the teacher is assigned. In Louisiana, most teachers are certified. During AYs 2018-19 through 2020-21, only 6,713 (12.5%) teachers, on average, did not have their certification. At A-rated schools, 5.7% of teachers are uncertified, while 23.8% of teachers at F-rated schools are uncertified. At T-rated schools,[21] all of which are charter schools and not required to hire certified teachers, 65.5% of teachers are uncertified. In addition, teachers at A- or B-rated schools tend to have more years of experience than teachers at C-, D-, or F-rated schools. Exhibit 10 shows teacher experience and certification by school letter grade.

[21] According to LAC 28:XI:1105(B), A turnaround school that was labeled "F" in the year in which the state board or the local school board approved the turnaround shall be reported as "T" for the first two years of operation under the turnaround provider.

Exhibit 10
Teacher Experience and Certification by School Letter Grade
Average of Academic Years 2018-19 through 2020-21

	Academic Years 2018-19 through 2020-21			Academic Year 2018-19 Only* (VAM Teachers Only)**	
Schools' SPS Letter Grade	**Average Years of Experience**	**Average Percent of Teachers who are Uncertified**	**Average Number of Teachers**	**Teachers Rated Proficient or Highly Effective**	**Number of Teachers with VAM Scores**
A	13.7	5.7%	9,179	57.5%	1,700
B	13.2	7.1%	16,092	50.9%	3,862
C	11.8	14.0%	14,394	47.9%	3,187
D	11.1	22.1%	6,903	46.1%	992
F	11.4	23.8%	4,471	49.0%	533
No Letter Grade/T-Rated Schools***	13.9	15.7%	2,824	56.8%	44
Total	**12.5**	**12.5%**	**53,836**	**50.5%**	**10,318****

*Based on teacher VAM scores from AY 2018-19. LDE did not calculate VAM scores for 2019-20 or 2020-21.
**Only teachers of 4th-8th grade English Language Arts, Mathematics, Social Studies, and Science, as well as teachers of Algebra I, Geometry, English I, and English II, were eligible to receive VAM scores in AY 2018-19.
***Includes non-school sites such as offices and vocational sites as well as schools that do not yet have SPS scores and T Schools. T-rated schools represent 84 teachers and 65.5% of those teachers are uncertified.
****This exhibit counts teachers multiple times if they are employed at multiple schools. Excluding these double counts, 10,187 of the 51,704 teachers in the state in AY 2018-19 that had VAM scores, consistent with the 19.7% of teachers with VAM scores reported on page 6.
Source: Prepared by legislative auditor's staff using PEP and SPS data from LDE.

Teachers in charter schools are less likely to be certified and have fewer years of experience on average than teachers in traditional public schools. Louisiana's Charter School Demonstration Act[22] allows charter schools discretion in decisions about the hiring of teachers, including whether teachers should have a teaching license. As a result, teachers in charter schools are much less likely than those in traditional public schools to be certified. As mentioned previously, certified teachers are more effective on average than uncertified teachers. In traditional public schools, 92.1% of teachers are certified, while 50.3% of teachers in charter schools are certified. According to LDE, charter schools in Louisiana by design have the autonomy to hire teachers with non-traditional backgrounds as part of the goal of encouraging innovation in public education. Exhibit 11 shows the number of certified teachers and years of experience by school type.

[22] LRS 17:3996 and 3997

Exhibit 11 Certified Teachers and Average Years of Experience by School Type Average of Academic Years 2018-19 through 2020-21			
School Type	**Percent of Teachers who are Certified**	**Average Years of Teacher Experience**	**Number of Teachers**
Traditional Public School	92.1%	13.0	47,921
Charter School	50.3%	8.5	5,915
Total	**87.5%**	**12.5**	**53,836**

***** Schools and other sites for which charter school status was not available.
Source: Prepared by legislative auditor's staff using PEP and SPS data from LDE.

Charter school teachers also have, on average, fewer years of experience than teachers in traditional public schools. Between AYs 2018-19 through 2020-21, traditional public-school teachers had an average of 13.0 years of experience, compared to charter school teachers who had 8.5 years. Among charter school teachers, 43.6% have fewer than five years of experience, while only 25.9% of teachers in traditional public schools do. In 2020 the Education Commission of the States reported that, of the 46 states (including the District of Columbia) that have charter school laws, 38 (82.6%) require that at least some charter school teachers be certified. Louisiana, Alabama, Arizona, Arkansas, the District of Columbia, Oklahoma, and West Virginia are the only states that do not require at least some charter school teachers to be certified, and for one state, it is unclear.

Objective 3: How can the state better attract and retain an effective teaching workforce?

In Objectives 1 and 2, we found that teachers with more experience tend to be more effective and that experience varies across the state, with less-experienced teachers concentrated in schools with more economically-disadvantaged students and in higher-populated areas. Teacher experience is closely tied to teacher retention because teachers gain experience by staying on from year to year. By increasing teacher retention from year to year, schools and districts can increase their average level of teacher experience, which may improve the effectiveness of Louisiana's teaching workforce.

To determine how Louisiana could improve its teacher retention, we used a regression analysis based on LDE's teacher personnel data to identify which teacher, school, or district attributes were associated with higher teacher retention rates.

We found that several factors may predict whether a teacher will be retained from one year to the next, particularly, salaries, cost of living, and whether a teacher participates in one of the state's retirement systems. As a result, the state may be able to increase teacher retention rates by increasing salaries, adjusting teacher salaries based on the cost of living, and providing retirement benefits to all public school teachers through the state's public retirement systems, including those that do not currently participate. We analyzed retention rates for the approximately 53,836 teachers who make up state's public school system teacher workforce. Overall, 90.0% of teachers remain in the state's public education workforce from one year to the next.[23] In other words, 10.0% of the state's teaching workforce leaves each year. These teachers may have retired, taken jobs in private schools or other states, pursued other occupations, or may have stopped working for other reasons. Exhibit 12 shows which factors are associated with changes to teacher retention rates based on the regression analysis we conducted.[24]

[23] We counted teachers who move between schools or systems, or who move into a non-teaching position at one of the state's school districts or chartering organizations, as retained, in addition to teachers who stayed on in the same position.

[24] Detailed results from our regression analysis are presented in Appendix E.

Exhibit 12 Factors Associated with Higher or Lower Retention Rates		
Changes in Teacher Retention	**Factors Impacting Retention Rates**	**Change in Teacher Retention Rate**
Average teacher retention rate is 90.0% statewide.		
	✓ Teacher with 10-19 years of experience, versus a first-year teacher	+4.0 percentage points
	✓ Teacher with 5 years of experience, versus a first-year teacher	+3.0 percentage points
	✓ Teacher Participates in Defined Benefit Public Retirement	+2.3 percentage points
	✓ Teacher is female	+2.7 percentage points
	✓ Increase Salary by $1,000	+0.4 percentage points
	× Parish Median Gross Rent increases by $100 per month	-0.2 percentage points
	× Economic Disadvantage Increases by 10 percentage points	-0.3 percentage points
	× Expulsion Rate Increases by 1 per 100 students	-0.2 percentage points
	× Teacher has a master's or educational specialist degree	-2.2 percentage points
	× Teacher has a doctoral degree	-4.2 percentage points
	× Teachers potentially eligible for retirement (30+ years of experience, versus a first-year teacher)	-14.6 percentage points
	= Suspension Rate increases by 1 per 1,000 students	Not Statistically Significant
	= Increase Professional Improvement Plan Salary by $1,000	Not Statistically Significant
	= Teacher with 20-29 years of experience, versus a first-year teacher	Not Statistically Significant
Source: Prepared by legislative auditor's staff based on analysis of data provided by LDE.		

Our analysis found that salary is positively correlated with teacher retention – for each additional $1,000 in salary, a teacher is 0.4 percentage points more likely to remain in Louisiana's public education workforce. This implies that public school systems may be able to improve retention by increasing teacher salaries. Salaries are impacted by different factors, some of them within a school system's control, such as allocation of funds to different priorities, and some of them outside of a school system's control, such as the size of their tax base. As a result, salaries vary significantly across the state. While the average annual teacher salary in Louisiana is $51,790, Red River Parish is the highest-paying district in the state, with its teachers earning an average of $64,750. Tensas Parish teachers earn the least with an annual average salary of $39,572.[25]

[25] See Appendix F for salary and teacher qualifications by district.

Currently, a teacher's VAM rating and the school's letter grade, assigned by LDE, as well as the percentage of students at the school who are economically disadvantaged *do not* significantly impact a teacher's salary.[26] The two most important factors in determining a teacher's salary in Louisiana are the teacher's years of experience and the amount of property taxes per pupil collected by the teacher's school system. Exhibit 13 shows how impactful these factors are on a teacher's salary.

Exhibit 13
Comparison of Teacher Salaries by Categories
Academic Year 2018-19 through 2020-21*

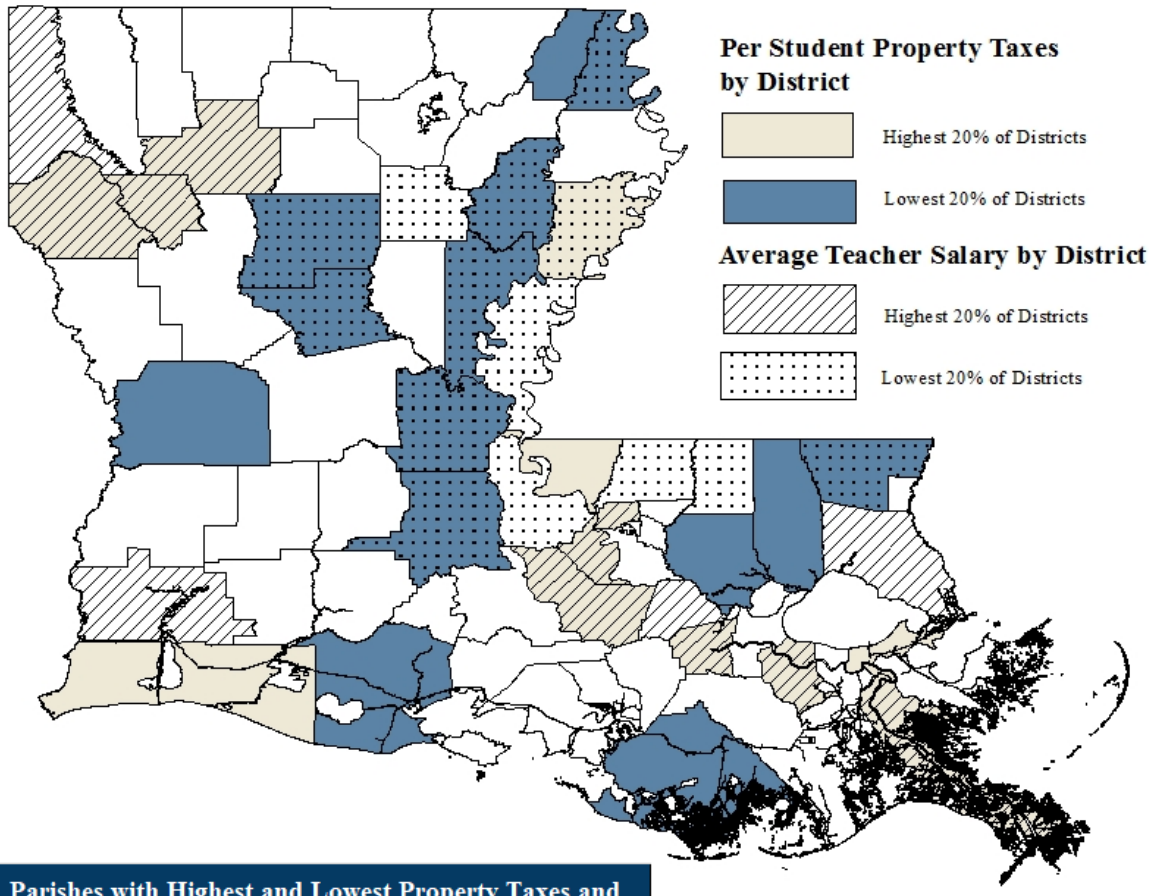
Characteristic	Low Category vs. High Category Average Salary	% Increase from Lowest to Highest
Teacher's years of teaching experience	**Least Experienced Quintile: $50,292**	**17.8%**
	Most Experienced Quintile: $59,217	
Property taxes per pupil at teacher's district	**Lowest Quintile: $47,331**	**8.5%**
	Highest Quintile: $51,362	
SPS letter grade of teacher's school	F-Rated: $51,488	3.9%
	A-Rated: $53,150	
Percentage of students economically disadvantaged at teacher's school	Most Economically Disadvantaged Quintile: $51,168	3.9%
	Least Economically Disadvantaged Quintile: $53,150	
Teacher effectiveness (VAM Score)*	Ineffective: $49,183	2.6%
	Highly Effective: $50,468	

*VAM scores are only available for AY 2018-19, and the salary figures reported here are only for that year.
Source: Prepared by legislative auditor's staff using data from LDE.

School districts with low levels of property taxes per pupil may face difficulty in offering higher salaries and attracting and retaining the most qualified teaching workforce. Appendix F shows the property tax per pupil by district. The Minimum Foundation Program formula provides funds to districts to ensure that all students are provided with a minimum level of funding. However, teacher salaries are determined by local school districts or chartering organizations. Ultimately, the level of economic development in a district and the level of taxation proposed by a school district's governing authority and approved by voters have a significant impact on teacher salaries, retention, and experience. Exhibit 14 shows the highest and lowest quintiles of parishes by teacher salaries, and the highest and lowest quintiles of property taxes per pupil for each parish. As shown, the parishes with the highest property taxes tend to be the parishes that pay their teachers the most, and vice-versa. For example, DeSoto Parish and St. Charles Parish are both in the top 20% of parishes for property taxes as well as for teacher salaries, while East Carroll and St. Landry Parish are both in the bottom 20% of parishes for both categories.

[26] See Appendix H for salary breakdown by various school characteristic.

Exhibit 14
Average Teacher Salary Compared to Per Student Property Tax
AY 2019



Parishes with Highest and Lowest Property Taxes and Salaries			
Salary	Property Taxes		
	Highest 20%	Middle	Lowest 20%
Highest 20%	9	4	0
Middle	3	33	6
Lowest 20%	1	5	8

Source: Prepared by legislative auditor's staff based on analysis of data provided by LDE.

Teachers working in school districts with higher housing costs tend to have lower retention rates, and these school districts tend to have less experienced teachers. Costs of living and teacher salaries determine the standard of living that a teacher can maintain in a particular area. We found that for each $100 decrease in monthly rents in a given parish, a teacher is 0.2 percentage points more likely to remain in the state's public education work force, holding all other factors constant. As shown in Exhibit 15, teachers in the parishes with the lowest rent to salary ratio had on average more than 4.5 additional years of experience than teachers in the parishes with the highest rent to salary ratio, while actually earning an average of

$64 less. We determined this ratio by dividing the median gross rent[27] in each parish by the average teacher salary in that parish.

Exhibit 15
Cost of Living and Salary Differences Compared to Teacher Experience
Academic Year 2018-19 through 2020-21

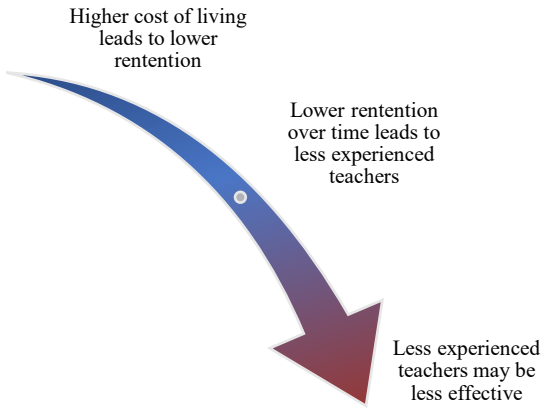
School System	Average Years of Teacher Experience	Average Teacher Annual Salary	Median Gross Monthly Rent of Parish	Percent of Salary Consumed by Rent
Parishes with Greatest Percent of Salary Consumed by Rent				
Plaquemines Parish	8.95	$57,859	$1,151	23.9%
St. Tammany Parish	15.25	$54,242	$1,040	23.0%
Orleans Parish	9.38	$51,412	$973	22.7%
Vernon Parish	14.81	$51,380	$961	22.4%
Jefferson Parish	13.06	$52,227	$961	22.1%
Average	**12.29**	**$53,424**	**$1,017**	**22.8%**
Parishes with Lowest Percent of Salary Consumed by Rent				
Red River Parish	17.1	$64,759	$509	9.4%
Bienville Parish	15.6	$55,391	$469	10.2%
East Carroll Parish	25.0	$46,118	$467	12.2%
West Carroll Parish	14.5	$51,035	$524	12.3%
Union Parish	12.0	$49,497	$512	12.3%
Average	**16.8**	**$53,360**	**$496**	**11.3%**
Difference between Highest and Lowest Parishes	**4.5**	**($64)**	**($521)**	**-11.5%**

*Plaquemines and Vernon parishes are home to U.S. military installations, which may contribute to the higher rents in these parishes.
Source: Prepared by legislative auditor's staff using LDE data and US Census data.

[27] As determined by the U.S. Census American Community Survey 2018 five-year estimates.

Because salaries for teachers in high-cost areas are not necessarily high enough to compensate for the higher cost of living, teachers may be less likely to remain in these areas and accumulate the years of experience that teachers in lower cost areas have. If salaries in areas with high housing costs were higher to compensate for their negative impact on retention, then retention rates would be more comparable between these groups. State and local education policy makers may wish to consider finding ways to compensate for these differences in costs of living. Exhibit 16 illustrates the process by which higher cost of living can impact teacher retention, experience, and effectiveness.

Exhibit 16
Impact of Higher Cost of Living on Teacher Retention, Experience, and Effectiveness



Source: Prepared by legislative auditor's staff based on analysis of LDE data.

Teachers who participate in the state's public retirement systems may have higher retention rates than non-participating teachers. As noted in our October 2021 performance audit on the impact of unfunded accrued liability payments on public education funding in Louisiana,[28] all traditional public schools are required to participate in the state's public retirement systems. Charter schools have the option to do so, and 51 of the state's 163 charter schools (31.3%) were exercising this option and participating in public retirement systems as of fiscal year 2020. In general, all employees at participating schools (except for part-time, temporary, and seasonal employees) are required to be members in one of the state's retirement systems. Employees at non-participating charter schools cannot participate in public retirement systems.

As noted in our regression analysis in Appendix E, teachers who participated in public retirement systems[29] were 2.3 percentage points more likely to continue working in the Louisiana public education workforce than teachers who did not participate. This positive relationship between public retirement and retention does not exist for early career teachers with five or fewer years of experience, but it is driven entirely by later career teachers, possibly because early career teachers are further from retirement age and are less motivated by retirement benefits when making career decisions.

[28] The full report can be accessed on LLA's website at https://app.lla.state.la.us/publicreports.nsf/0/8d86cc09af17e0368625876d007c42be/$file/00024d0ed.pdf.

[29] We defined teachers as participating in public retirement if they were coded in LDE's PEP data as participating in the Teachers' Retirement System of Louisiana, Louisiana School Employees' Retirement System, Louisiana State Employees Retirement System, or the Louisiana Parochial School Employees Retirement System, as well as teachers in DROP.

Among other reasons, teachers who want to pursue long-term careers as teachers in Louisiana may intentionally avoid charter schools that do not participate in public retirement because they want to start accruing experience that will count towards their retirement income and get them closer to their minimum retirement age. However, the structure of the state's defined-benefit pension systems may also incentivize teachers to remain in the teaching workforce longer than they would under a more portable, defined contribution retirement plan. Thus, requiring all teachers to participate in public retirement may not increase retention rates by the full 2.3 percentage points indicated by our regression analysis, but the impact on retention is unlikely to be negative.

APPENDIX A: MANAGEMENT'S RESPONSE

LOUISIANA DEPARTMENT OF EDUCATION

May 20, 2022

Louisiana Legislative Auditor
Mr. Michael Waguespack
1600 North 3rd Street
P.O. Box 94397
Baton Rouge, LA 70804-9397

Mr. Waguespack,

The department has reviewed the performance audit review report entitled "Impact of Teacher Qualifications and Pay on Teacher Retention and Student Performance Louisiana Public School Teachers." The department is providing this letter in response to the report. With that intent, please consider the following:

There are few contributors more important to the academic success of a student than teacher quality. We appreciate this from a body of educational research, but also from our personal experiences as students, parents, professionals, policy-makers, and community members. Teaching is a noble profession and the beginning of other careers. Moreover, teachers do heroes work - often without the recognition of respect, support, or financial reward. What do they make? They make a difference.

In the State of Louisiana, and across our country, we must elevate the teaching profession. We must consider policy and practice adjustments to recruit talent, retain educators, and reconsider staffing and compensation models for the twenty-first century. Teachers are valuable professionals.

We should listen to classroom teachers, better understanding the conditions for which they work and exploring concrete ways to improve those conditions. By doing this, and making necessary adjustments, we are more likely to retain teachers. Further, satisfied teachers would serve as recruiters for future educators. Today, unfortunately, too few of our teachers are encouraging students, friends, and neighbors to consider careers in education. Even in our colleges of education, we note about 500 fewer education graduates annually as compared to just ten years ago.

In terms of recruiting, we should continue our development of high-school pathways for future teachers. We have recently made significant progress, working alongside local school systems, to expand these options for high school students. We should also consider seamless opportunities for degreed individuals to enter the teaching profession from other career pathways. This should include supporting them with mentorship, instructional coaching, and a direct line to certification and/or permanency through performance reviews. Further, we might turn to partnerships for teaching apprenticeship pathways and/or non-traditional credentialing avenues. We must also consider flexible staffing for today's mobile workforce in lieu of expectations that all teachers must be full-time employees. Finally, we should continue to explore alternative options to ensure students have access to the highest quality instructors

which could, in the future, integrate additional technology while maintaining student privacy. The future is not the past; we must make adjustments to succeed.

For retention, we must be more proficient within local settings to improve workplace environments. At present, the education profession loses far too many employees far too soon. Teachers deserve school leadership they find supportive, opportunities to develop professionally, schools where their voices are heard, classroom conditions suited for success, non-administrative career pathways, and professional, differentiated compensation targeted toward need. We can't simply hope these retention requisites into reality; instead, we must be thoughtful, deliberate, and urgent in their implementation at every level of governance and management. These challenges will not be easily solved, nonetheless, they deserve the attention and action of leaders and policy-makers throughout Louisiana.

We have a renewed commitment to education within the State of Louisiana. This is true for a number of reasons but is evident from solutions-oriented educators working to recover learning loss and accelerate academics, community leaders with high expectations for school improvement, and policy-makers engagement in the arena. Still, student success is presently dependent on teachers. The best policy will fail without adult capacity for implementation. Programs will have marginalized value without competent effective educators. Educators matter and data indicate Louisiana needs an additional 2,000 teachers, at present, to staff all classrooms.

Students, in a state with long-standing educational challenges recently exacerbated by a pandemic and storms, deserve a high-quality teacher in every classroom. We exist to educate students but we cannot exist without teachers. Sadly, over several decades, we have too frequently left our teachers behind. We must all do better together. For them. For our students.

Our administration believes that children are our highest priority and educators are valued professionals. We appreciate the interest in this issue and thank you for the courtesies extended to the department to provide a response.

Sincerely,

Dr. Cade Brumley

State Superintendent of Education

APPENDIX B: SCOPE AND METHODOLOGY

This report provides the results of our performance audit on teacher effectiveness and retention in Louisiana in improving student academic performance. We conducted this performance audit under the provisions of Title 24 of the Louisiana Revised Statutes of 1950, as amended. This audit covered Academic Years (AY) 2018-19 through 2020-21. The objectives of this audit were:

Objective 1. What teacher qualifications are associated with higher teacher effectiveness in improving student academic performance?

Objective 2. What types of schools or school districts have more experienced and certified teachers?

Objective 3. How can the state better attract and retain an effective teaching workforce?

Because the purpose of this report was to provide information based on a statistical analysis of LDE data to the legislature on teacher salary and retention and how they impact student performance, the scope of our audit was less than that required by *Government Auditing Standards* issued by the Comptroller General of the United States. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our objective. To answer our objective, we performed the following audit steps:

- Obtained teacher personnel data from LDE from the following databases:
    - Profile of Educational Personnel (PEP), which contains information on demographics, professional qualifications, job assignment, compensation, employment status, and other attributes for personnel employed by public schools, including state and charter schools as well as traditional public schools. We obtained data for AYs 2018-19, 2019-20, and 2020-21.
    - Teacher certification data, including a detailed listing of all state teaching certifications held by each teacher, for AYs 2018-19, 2019-20, and 2020-21. Consistent with LDE's practice, we counted a teacher as certified if they held a permanent teaching certificate, but not if they had a temporary or emergency license.
    - Teacher evaluation ratings, which contains up to four ratings for each teacher: a professional practice rating, a student growth rating, a student learning target rating, and a value-added model (VAM) rating. Each teacher also has an overall evaluation rating. We obtained data for AY 2018-19 only because VAM scores were not calculated for AYs 2019-20 or 2020-21 due to the COVID-19 pandemic. Only teachers in the 4th – 8th

grade who teach English language arts, math, science, and social studies receive VAM ratings. Teachers of Algebra I and Geometry, up to grades 9 and 10 respectively, also receive VAM ratings. As a result, only 19.7% of teachers had VAM scores for AY2018-19.

- Assessed the reliability of the PEP employee lists and salary amounts provided by LDE by matching to wage data from the Louisiana Workforce Commission's unemployment insurance tax program. Overall, 23 of the 31 personnel records in our random sample had wage amounts that differed by less than 15% in both systems. Five of the 31 had no wage records in the LWC data, and the remaining three had wages that differed by more than 15%. Overall, we noted these discrepancies but concluded that the data would be sufficiently reliable for our purposes.

- Obtained school-level data from the U.S. National Center for Education Statistics classifying each school as city, town, suburban, or rural. Based on input from LDE, we further separated city schools into those in Orleans Parish versus those in the rest of the state.

- Estimated housing costs for teachers in each school district based on the median gross rent for the corresponding parish as reported by the U.S. Census Bureau in the 2018 five-year estimates from the American Community Survey. We use median gross rents as a proxy for overall housing costs, because even if some teachers are homeowners instead of renters, the cost of homeownership will be correlated with rental costs. For each district, we use the rental cost for the parish that the district is situated in, not the district in which a particular teacher resides. Even though some teachers employed in districts with high housing costs may be able to find less expensive housing in an adjacent parish, this still amounts to a real cost for the teacher because of the increased commute time and transportation costs.

- Obtained additional information for each school district from LDE's website for AYs 2018-19 through 2020-21, including the amount of revenues and tax base for property and sales tax.

- Obtained additional information for each school or site code from LDE's website for AYs 2018-19, 2019-20, and 2020-21 on discipline rates, economic disadvantage, Minimum Foundation Program student headcounts, and School Performance Scores (SPS).

- Analyzed the relationship between teacher effectiveness, as measured by VAM ratings, and various teacher, school, and district characteristics. We focused on VAM ratings because these control for student characteristics outside of a teacher's control, such as prior-year test scores, economically disadvantaged or limited English proficiency status, absences, and disciplinary incidents. We employed two basic approaches: a unidimensional cross-sectional approach, and a regression-based approach. Overall, the results of both analyses were consistent,

with both approaches showing that teachers who had more experience or who were certified tended to be more effective, while teachers with graduate degrees were no more effective than those with bachelor's degrees only. The results from the regression analysis are presented in Appendix I.

- Analyzed the relationship between district- and school-level characteristics and teacher characteristics. Specifically, we considered the teacher characteristics such as salaries, educational attainment, certification rates, experience, public retirement system participation, and effectiveness (as measured by VAM ratings), and analyzed the relationship between these variables and school- and district-level variables such as rates of economic disadvantaged status and SPS scores at each school, as well as district-level characteristics such as property taxes per pupil.

- Determined retention outcomes for all teachers in the PEP database. We identified teachers across years using identification numbers provided by LDE. We calculated two different retention statuses, one based on whether the teacher was employed in the same district or charter sponsoring organization during the following year, and another based on whether the teacher was employed at any school district or charter sponsoring organization in the state during the following year. We also ran the same regressions on early-career teachers with less than five years of experience because this group tends to have higher rates of attrition than mid-career teachers. The results of these regressions are presented in Appendix E.

- Sent report to LDE to review and provide feedback.

APPENDIX C: SOURCES AND LITERATURE SUMMARY

Year	Authors	Title	Journal	Aggregate or Individual-Level Data	Effect of Teacher Experience on Student Test Scores (Standardized to mean 0, standard deviation 1)	Effect of Teacher Certification on Student Test Scores	Effects of Teachers' Graduate Degrees on Student Test Scores
2003	Aaronson, Daniel; Barrow, Lisa; Sander, William	"Teachers and Student Achievement in the Chicago Public Schools"	*Journal of Labor Economics*	Individual student/teacher, grade 9, Chicago Public Schools	Experience/tenure included as a polynomial specification, no statistically significant impacts found on math scores. Authors note in text that they found a 0.02 grade-equivalent increase in math scores over the first few years that flattens and eventually recedes, using binned experience variables.	High school certification: -0.033 grade-level equivalents in math	Master's Degree: +0.007 grade-level equivalents in math PhD: -0.068 grade-level equivalents in math

Year	Authors	Title	Journal	Aggregate or Individual-Level Data	Effect of Teacher Experience on Student Test Scores (Standardized to mean 0, standard deviation 1)	Effect of Teacher Certification on Student Test Scores	Effects of Teachers' Graduate Degrees on Student Test Scores
2005	Darling-Hammond, Linda; Holtzman, Deborah J.; Gatlin, Su Jin; Heilig, Julian Vasquez	"Does Teacher Preparation Matter? Evidence About Teacher Certification, Teach for America, and Teacher Effectiveness"	*Education Policy Analysis Archives*	Individual student/teacher, grades 4-5, Houston, Texas	Increase in test score for each additional year of teaching experience: -0.025** S.D. TLI Math -0.008* S.D. TLI Reading +0.031** S.D. SAT-9 Math +0.050** S.D. SAT-9 Reading +0.082** Aprenda Math +0.030 Aprenda Reading	Uncertified vs. Certified: -0.525** S.D. TLI Math -0.580** S.D. TLI Reading -0.414** SAT-9 Math -0.516** SAT-9 Reading -1.41** Aprenda Math -0.066 Aprenda Reading	Master's degree or higher: -0.169** S.D. TLI Math -0.077 S.D. TLI Reading -0.252* S.D. SAT-9 Math -0.329** S.D. SAT-9 Reading -0.393 S.D. Aprenda Math +0.369 S.D. Aprenda Reading
2005	Rivkin, Steven G.; Hanushek, Eric A.; Kain, John F.	"Teachers, Schools, and Academic Achievement"	*Econometrica*	Individual student/teacher, grades 3-7, Texas, but teacher characteristics are only available at the school-grade level (researchers could not determine the specific teacher a student was assigned to unless the school had only one teacher for the relevant subject and grade)	Percentage of teachers in a school and grade with 0 years of experience, versus 6+ years of experience -0.073** S.D. math -0.026 S.D. Reading Note: 6+ years experience was the omitted, base category, so this implies that new teachers were less effective than experienced teachers for math, and not significantly differently effective for reading	N.A.	Proportion with graduate degree: -0.021 S.D. math +0.010 S.D. reading

Year	Authors	Title	Journal	Aggregate or Individual-Level Data	Effect of Teacher Experience on Student Test Scores (Standardized to mean 0, standard deviation 1)	Effect of Teacher Certification on Student Test Scores	Effects of Teachers' Graduate Degrees on Student Test Scores
2006	Clotfelter, Charles T.; Ladd, Helen F.; Vigdor, Jacob L.	"Teacher-Student Matching and Assessment of Teacher Effectiveness"	*Journal of Human Resources*	Individual student/teacher, grade 5, North Carolina, 2000-2001 school year	6-12 years of experience versus 0 years: Full sample: +0.076** S.D. Math +0.051** S.D. Reading Limited sample to avoid bias from within-school teacher-student assignments: +0.085** S.D. Math +0.064** S.D. Reading	N.A. (only reports results for National Board Certified Teachers)	Advanced Degree: Full sample: -0.016* S.D. Math -0.018** S.D. Reading Limited sample to avoid bias from within-school teacher-student assignments: -0.023* S.D. Math -0.007 S.D. Reading
2007	Clotfelter, Charles T.; Ladd, Helen F.; Vigdor, Jacob L.	"Teacher Credentials and Student Achievement: Longitudinal Analysis with Student Fixed Effects"	*Economics of Education Review*	Individual student/teacher, grades 3, 4, and 5, North Carolina	6-12 years of experience vs. no experience: +0.094** S.D. Math Gains +0.071** S.D. Reading Gains	Other license vs. regular license: -0.059[a] S.D. Math Gains -0.024[a] S.D. Reading Gains	Graduate degree: +0.002 S.D. Math -0.008** S.D. Reading
2008	Kane, Thomas J. Rockoff, Jonah E. Staiger, Douglas O.	"What Does Certification Tell Us About Teacher Effectiveness? Evidence from New York City"	*Economics of Education Review*	Individual student/teacher, grades 4-8, New York City	5+ Years of Experience versus 0 years: +0.082** S.D. Math +0.048** S.D. Reading	Teaching Fellow: +0.000 S.D. Math -0.012** S.D. Reading Teach for America: +0.023 S.D. Math +0.005 S.D. Reading International Programs: -0.023** S.D. Math +0.004 S.D. Reading Other Uncertified: +0.000 S.D. Math +0.005 S.D. Reading	N.A.

Year	Authors	Title	Journal	Aggregate or Individual-Level Data	Effect of Teacher Experience on Student Test Scores (Standardized to mean 0, standard deviation 1)	Effect of Teacher Certification on Student Test Scores	Effects of Teachers' Graduate Degrees on Student Test Scores
2011	Harris, Douglas N.; Sass, Tim R.	"Teacher Training, Teacher Quality, and Student Achievement"	*Journal of Public Economics*	Individual student/teacher, grades 3-10, Florida	10-14 years of experience vs. no experience: Math: +0.032 S.D. Elementary (grades 4-5) +0.073** S.D. Middle (grades 6-8) -0.059** S.D. High School (grades 9-10) Reading: +0.069* S.D. Elementary (grades 4-5) +0.050* S.D. (grades 6-8) -0.124** S.D. (grades 9-10)	N.A.	Advanced degree: Math: -0.010 S.D. Elementary (grades 4-5) +0.021* S.D. (grades 6-8) Reading: +0.008 S.D. Elementary (grades 4-5) -0.033† S.D. Middle (grades 6-8)
2015	Papay, John P.; Kraft, Matthew A.	"Productivity Returns to Experience in the Teacher Labor Market: Methodological Challenges and New Evidence on Long-Term Career Improvement"	*Journal of Public Economics*	Individual student/teacher, grades 4-8, large urban school district in the Southern United States	Increase in test score for each additional year of teaching experience (separate coefficients for different segments of a teacher's career): +0.077** S.D. Math for years 0-5 +0.040† S.D. Math for years 5-15 +0.051** S.D. Reading for years 0-5 +0.021 S.D. Reading for years 5-15	N.A.	N.A.

Year	Authors	Title	Journal	Aggregate or Individual-Level Data	Effect of Teacher Experience on Student Test Scores (Standardized to mean 0, standard deviation 1)	Effect of Teacher Certification on Student Test Scores	Effects of Teachers' Graduate Degrees on Student Test Scores
2015	Ladd, Helen F. Sorensen, Lucy C.	"Returns to Teacher Experience: Student Achievement and Motivation in Middle School"	*National Center for Analysis of Longitudinal Data in Education Research Working Paper 112*	Individual student/teacher, grades 6-8, North Carolina	10 Years of experience vs. 0 years: +0.16** S.D. Math +0.07** S.D. ELA	Lateral License: -0.04** S.D. Math -0.02† S.D. ELA	N.A.
2019	Toropova, Anna; Johansson, Stefan; Myrberg, Eva	"The Role of Teacher Characteristics for Student Achievement in Mathematics and Student Perceptions of Instructional Quality"	*Education Inquiry*	Individual student/teacher, grade 8, Sweden	Increase in test score for each additional year of teaching experience: +0.11 S.D. Math†	N.A.	N.A.

Key: ** p<0.01, * p<0.05, † p<0.1. Effects without one of these markings were not statistically significant at the p≤0.1 level.
[a] Clotfelter et al. (2007) report that there were statistically significant coefficients on the indicator variables for other licensure versus the base case of regular licensure (see Table 6, p. 680), but they do not report p-values or standard errors for the coefficient estimates. However, the other tables consistently use 0.05 as the threshold p-value for statistical significance.

Source: Prepared by legislative auditor's staff based on analysis of published research.

APPENDIX D: VAM RATINGS BY TEACHER CHARACTERISTIC, ACADEMIC YEAR (AY) 2018-2019

Summary of Qualifications by Value Added Model Rating AY 2018-2019					
Value Added Model Rating	**Percent of Teachers who Received VAM Scores**	**Average Experience**	**Percent of Teachers who are Certified**	**Percent of Teachers with Graduate Degrees**	**Number of Teachers**
Ineffective	10.0%	10.2	87.5%	31.4%	1,024
Effective - Emerging	39.3%	11.0	91.2%	31.3%	4,003
Effective - Proficient	30.3%	11.3	92.3%	29.8%	3,085
Highly Effective	20.4%	12.0	93.8%	31.6%	2,075
Total	**100.0%**	**11.2**	**91.7%**	**30.9%**	**10,187**

Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

VAM Ratings by Teacher Certification Status AY 2018-2019					
Certification Status	**Ineffective**	**Effective-Emerging**	**Effective-Proficient**	**Highly Effective**	**Number of Teachers**
Certified	9.6%	39.1%	30.5%	20.8%	9,341
Uncertified	15.1%	41.5%	28.3%	15.1%	846
Total	**10.0%**	**39.3%**	**30.3%**	**20.4%**	**10,187**

Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

VAM Ratings by Teacher Years of Experience AY 2018-2019					
Years of Experience	**Ineffective**	**Effective-Emerging**	**Effective-Proficient**	**Highly Effective**	**Number of Teachers**
0 – 1 years	14.1%	42.9%	28.4%	14.6%	1,432
2 – 3 years	10.1%	41.3%	31.0%	17.6%	1,050
4 – 5 years	10.3%	36.7%	32.6%	20.4%	1,049
6 – 7 years	8.9%	39.4%	31.3%	20.4%	799
8 – 9 years	11.0%	36.3%	29.6%	23.1%	736
10 – 19 years	9.3%	38.9%	29.5%	22.3%	3,153
20 – 29 years	7.8%	39.0%	31.5%	21.7%	1,599
30+ years	10.6%	36.6%	29.8%	23.0%	369
Total	**10.0%**	**39.3%**	**30.3%**	**20.4%**	**10,187**

Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

VAM Ratings by Teacher Degree Attainment AY 2018-2019					
Teacher Degree Attainment	**Ineffective**	**Effective-Emerging**	**Effective-Proficient**	**Highly Effective**	**Number of Teachers**
Bachelor's Degree	10.0%	39.0%	30.8%	20.2%	7,038
Master's Degree	10.2%	39.7%	29.1%	21.0%	3,035
Higher than Master's Degree	10.7%	42.0%	30.3%	17.0%	112
Total	**10.0%**	**39.3%**	**30.3%**	**20.4%**	**10,185***

* Two teachers were not included in this table because they had less than a bachelor's degree.
Source: Prepared by legislative auditor's staff using LDE VAM ratings and Profile of Personnel (PEP) data.

APPENDIX E: FACTORS ASSOCIATED WITH HIGHER OR LOWER TEACHER RETENTION RATES

Exhibit E.1
Detailed Regression Results

	(1) Retained in District	(2) Retained in District (rand. effects)	(3) Retained in State	(4) Retained in State (rand. effects)	(5) Retained in State (<=5 Years Experience Only)	(6) Retained in State (<=5 Years Experience Only) (with rand. effects)	(7) Retained in State (excluding Orleans Parish)	(8) Retained in State (excluding Orleans Parish) (with rand. effects)
Salary (in 000's)	0.00520***	0.00538***	0.00482***	0.00510***	0.00941***	0.00955***	0.00461***	0.00493***
	(0.000514)	(0.000547)	(0.000465)	(0.000490)	(0.000553)	(0.000519)	(0.000461)	(0.000490)
(Salary (in 000's))^2	-0.00000790***	-0.00000791***	-0.00000729***	-0.00000714***	-0.0000267***	-0.0000268***	-0.00000696***	-0.00000688***
	(0.00000163)	(0.00000175)	(0.00000147)	(0.00000156)	(0.00000340)	(0.00000315)	(0.00000143)	(0.00000153)
Professional Improvement Plan Indicator (1 if employee received PIP salary)	-0.00444	-0.00659	-0.0154	-0.0130	0.399***	0.407***	-0.0139	-0.00960
	(0.0163)	(0.0174)	(0.0147)	(0.0180)	(0.0146)	(0.0142)	(0.0150)	(0.0184)
Public Retirement Indicator	-0.00741	-0.00831	0.0232***	0.0259***	-0.00186	-0.000151	0.0329***	0.0385***
	(0.00762)	(0.00813)	(0.00600)	(0.00704)	(0.0100)	(0.0112)	(0.00837)	(0.00959)
Certified Indicator	0.0373***	0.0392***	0.0383***	0.0359***	0.0248***	0.0213***	0.0460***	0.0431***
	(0.00542)	(0.00565)	(0.00423)	(0.00472)	(0.00514)	(0.00562)	(0.00477)	(0.00525)
Charter School Indicator	-0.0507***	-0.0491***	-0.0216***	-0.0270***	-0.0468***	-0.0474***	-0.00640	-0.00719
	(0.00666)	(0.00713)	(0.00502)	(0.00603)	(0.00946)	(0.0106)	(0.00751)	(0.00872)

	(1) Retained in District	(2) Retained in District (rand. effects)	(3) Retained in State	(4) Retained in State (rand. effects)	(5) Retained in State (<=5 Years Experience Only)	(6) Retained in State (<=5 Years Experience Only) (with rand. effects)	(7) Retained in State (excluding Orleans Parish)	(8) Retained in State (excluding Orleans Parish) (with rand. effects)
Economically Disadvantaged % at Teacher's School	-0.164***	-0.181***	-0.0288***	-0.0417***	-0.0432***	-0.0589***	-0.0319***	-0.0452***
	(0.00707)	(0.00776)	(0.00507)	(0.00634)	(0.0105)	(0.0124)	(0.00519)	(0.00648)
Parish Median Gross Rent	-0.0000196*	-0.0000254*	-0.0000170*	-0.0000203*	-0.0000295*	-0.0000401*	-0.0000145	-0.0000174
	(0.00000989)	(0.0000106)	(0.00000734)	(0.00000885)	(0.0000132)	(0.0000158)	(0.00000751)	(0.00000907)
2019-20 AY Indicator	0.00482*	-0.0145***	0.0000410	-0.0441***	-0.000883	-0.0608***	-0.000674	-0.0427***
	(0.00240)	(0.00228)	(0.00180)	(0.00142)	(0.00348)	(0.00290)	(0.00181)	(0.00143)
Suspension Rate per 100 students	-0.0667***	-0.0763***	-0.00502	-0.0132	0.0106	0.00128	-0.00700	-0.0138
	(0.0106)	(0.0114)	(0.00767)	(0.00869)	(0.0144)	(0.0158)	(0.00777)	(0.00882)
Expulsion Rate per 100 Students	0.0360	0.0327	-0.194***	-0.180**	-0.346***	-0.309**	-0.186***	-0.171**
	(0.0727)	(0.0762)	(0.0547)	(0.0574)	(0.101)	(0.106)	(0.0550)	(0.0578)
<Bachelor's Degree Indicator	0.0428*	0.0389*	-0.0250	-0.0210	-0.0125	0.00125	-0.0319	-0.0281
	(0.0176)	(0.0190)	(0.0162)	(0.0184)	(0.0249)	(0.0277)	(0.0178)	(0.0198)
Master's/Specialist Degree Indicator	-0.0429***	-0.0443***	-0.0216***	-0.0244***	-0.0313***	-0.0345***	-0.0205***	-0.0235***
	(0.00281)	(0.00297)	(0.00202)	(0.00247)	(0.00438)	(0.00512)	(0.00205)	(0.00251)
Doctoral Degree Indicator	-0.0456***	-0.0502***	-0.0417***	-0.0505***	-0.0303	-0.0323	-0.0438***	-0.0523***
	(0.0136)	(0.0146)	(0.0105)	(0.0127)	(0.0242)	(0.0276)	(0.0111)	(0.0134)
Female Indicator	0.0338***	0.0359***	0.0268***	0.0312***	0.0408***	0.0463***	0.0242***	0.0286***
	(0.00353)	(0.00371)	(0.00263)	(0.00322)	(0.00467)	(0.00555)	(0.00271)	(0.00334)
1 Year Experience Indicator	0.0257***	0.00878	0.0157**	-0.00539	0.00366	-0.0135*	0.0214***	-0.000452
	(0.00766)	(0.00760)	(0.00596)	(0.00536)	(0.00588)	(0.00533)	(0.00615)	(0.00549)
2 Years Experience Indicator	0.0328***	0.0122	0.0149*	-0.0127*	-0.00237	-0.0237***	0.0149*	-0.0114

	(1) Retained in District	(2) Retained in District (rand. effects)	(3) Retained in State	(4) Retained in State (rand. effects)	(5) Retained in State (<=5 Years Experience Only)	(6) Retained in State (<=5 Years Experience Only) (with rand. effects)	(7) Retained in State (excluding Orleans Parish)	(8) Retained in State (excluding Orleans Parish) (with rand. effects)
	(0.00824)	(0.00829)	(0.00635)	(0.00597)	(0.00616)	(0.00589)	(0.00654)	(0.00615)
3 Years Experience Indicator	0.0505***	0.0321***	0.0290***	0.00433	0.0120*	-0.00695	0.0318***	0.00798
	(0.00827)	(0.00835)	(0.00626)	(0.00600)	(0.00609)	(0.00592)	(0.00638)	(0.00609)
4 Years Experience Indicator	0.0590***	0.0410***	0.0334***	0.00960	0.0152*	-0.00170	0.0342***	0.0109
	(0.00832)	(0.00841)	(0.00623)	(0.00604)	(0.00599)	(0.00598)	(0.00634)	(0.00614)
5 Years Experience Indicator	0.0638***	0.0456***	0.0300***	0.00683	0.0114	-0.00274	0.0301***	0.00849
	(0.00830)	(0.00838)	(0.00628)	(0.00612)	(0.00610)	(0.00627)	(0.00640)	(0.00620)
6 Years Experience Indicator	0.0681***	0.0509***	0.0388***	0.0171**			0.0425***	0.0215***
	(0.00852)	(0.00860)	(0.00630)	(0.00609)			(0.00632)	(0.00610)
7 Years Experience Indicator	0.0772***	0.0588***	0.0466***	0.0264***			0.0476***	0.0298***
	(0.00887)	(0.00896)	(0.00639)	(0.00618)			(0.00646)	(0.00624)
8 Years Experience Indicator	0.0679***	0.0513***	0.0407***	0.0236***			0.0410***	0.0252***
	(0.00923)	(0.00931)	(0.00670)	(0.00650)			(0.00677)	(0.00658)
9 Years Experience Indicator	0.0749***	0.0613***	0.0412***	0.0213**			0.0403***	0.0202**
	(0.00924)	(0.00938)	(0.00664)	(0.00651)			(0.00674)	(0.00659)
10-19 Years Experience Indicator	0.0875***	0.0718***	0.0401***	0.0237***			0.0406***	0.0248***
	(0.00736)	(0.00751)	(0.00597)	(0.00592)			(0.00602)	(0.00599)
20-29 Years Experience Indicator	0.0666***	0.0482***	-0.00862	-0.0272***			-0.00772	-0.0263***
	(0.00813)	(0.00829)	(0.00674)	(0.00669)			(0.00679)	(0.00677)
30+ Years Experience	-0.0493***	-0.0761***	-0.146***	-0.181***			-0.148***	-0.184***

	(1) Retained in District	(2) Retained in District (rand. effects)	(3) Retained in State	(4) Retained in State (rand. effects)	(5) Retained in State (<=5 Years Experience Only)	(6) Retained in State (<=5 Years Experience Only) (with rand. effects)	(7) Retained in State (excluding Orleans Parish)	(8) Retained in State (excluding Orleans Parish) (with rand. effects)
Indicator								
	(0.0100)	(0.0103)	(0.00872)	(0.00911)			(0.00883)	(0.00926)
Constant Term	0.615***	0.638***	0.641***	0.657***	0.538***	0.574***	0.636***	0.646***
	(0.0202)	(0.0216)	(0.0167)	(0.0187)	(0.0238)	(0.0255)	(0.0174)	(0.0196)
Includes Teacher-Specific Random-Effect	No	Yes	No	Yes	No	Yes	No	Yes
N	101,252	101,252	101,252	101,252	33,071	33,071	94,261	101,252

Standard errors in parentheses, clustered at the teacher level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Prepared by legislative auditor's staff based on analysis of data from LDE and the U.S. Census Bureau.

APPENDIX F: AVERAGE SALARY, TEACHER QUALIFICATIONS, AND PER STUDENT PROPERTY TAXES, AYS 2018-19 – 2020-21, BY DISTRICT

District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Traditional Public School Districts						
Acadia Parish	9,507	14.0	90.2%	21.5%	$1,277	$46,019
Allen Parish	4,078	13.1	89.3%	19.6%	$1,488	$47,777
Ascension Parish	22,978	11.9	95.2%	32.6%	$3,836	$53,905
Assumption Parish	3,193	14.2	96.7%	31.0%	$2,612	$47,709
Avoyelles Parish	5,095	13.7	89.5%	22.6%	$673	$45,965
Beauregard Parish	5,832	15.5	98.8%	29.1%	$2,566	$52,351
Bienville Parish	2,060	15.1	93.1%	41.5%	$10,815	$55,383
Bossier Parish	22,496	12.4	99.6%	38.3%	$2,994	$54,615
Caddo Parish	35,951	14.2	94.8%	39.3%	$3,677	$56,794
Calcasieu Parish	30,062	13.0	91.8%	32.2%	$2,485	$53,525
Caldwell Parish	1,601	10.1	76.1%	38.7%	$1,965	$43,499
Cameron Parish	1,280	13.2	94.0%	23.5%	$10,076	$49,968
Catahoula Parish	1,135	18.5	90.3%	35.1%	$788	$42,799
Central Community School District	4,758	12.6	99.0%	29.6%	$2,021	$51,123
City of Baker School District	1,226	11.2	65.6%	46.3%	$1,376	$46,556
City of Bogalusa School District	1,903	13.5	76.7%	39.2%	$3,001	$48,407
City of Monroe School District	8,108	13.9	87.1%	52.2%	$1,824	$56,094
Claiborne Parish	1,672	13.8	89.1%	37.3%	$2,604	$51,523
Concordia Parish	3,266	13.7	79.5%	28.8%	$1,581	$46,386
DeSoto Parish	4,898	13.4	98.1%	33.6%	$9,134	$59,806
East Baton Rouge Parish	40,161	13.1	92.9%	46.9%	$3,830	$54,457
East Carroll Parish	879	20.8	88.4%	44.9%	$986	$46,048
East Feliciana Parish	1,765	7.1	52.9%	18.7%	$2,233	$42,866

District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Evangeline Parish	5,673	14.6	92.1%	20.8%	$1,388	$48,875
Franklin Parish	2,983	12.0	64.5%	31.8%	$919	$43,764
Grant Parish	2,899	11.1	75.6%	23.2%	$1,169	$43,690
Iberia Parish	12,101	13.7	94.8%	25.9%	$1,643	$49,368
Iberville Parish	4,447	11.2	89.6%	34.4%	$9,712	$57,821
Jackson Parish	2,211	13.5	97.8%	37.7%	$2,430	$49,692
Jefferson Davis Parish	5,602	14.0	90.7%	25.6%	$1,594	$51,143
Jefferson Parish	48,410	11.9	83.3%	34.1%	$2,336	$52,287
Lafayette Parish	31,248	10.5	97.2%	29.3%	$2,251	$49,103
Lafourche Parish	13,973	14.2	94.0%	36.1%	$2,904	$48,415
LaSalle Parish	2,560	13.0	95.6%	32.6%	$1,549	$48,591
Lincoln Parish	5,884	12.6	98.7%	46.4%	$3,373	$50,837
Livingston Parish	25,720	13.2	97.1%	26.9%	$722	$50,243
Madison Parish	1,159	22.2	89.8%	44.9%	$1,767	$48,654
Morehouse Parish	3,521	14.3	80.0%	34.5%	$1,698	$49,250
Natchitoches Parish	5,722	13.6	93.9%	45.0%	$1,860	$53,811
Orleans Parish	19,774	10.7	57.6%	37.9%	$8,280	$52,873
Ouachita Parish	18,733	13.9	99.9%	45.3%	$1,738	$52,349
Plaquemines Parish	3,954	8.2	94.5%	34.0%	$6,780	$58,084
Pointe Coupee Parish	2,718	11.2	71.4%	17.2%	$3,038	$47,124
Rapides Parish	22,478	12.9	92.6%	29.9%	$1,748	$51,947
Red River Parish	1,387	15.6	94.4%	34.1%	$9,666	$64,750
Richland Parish	2,733	13.8	97.1%	31.5%	$2,518	$50,648
Sabine Parish	4,183	13.1	91.0%	25.4%	$1,636	$47,908
St. Bernard Parish	7,713	11.5	94.8%	28.4%	$2,237	$51,855
St. Charles Parish	9,615	13.6	96.4%	30.9%	$9,142	$56,423
St. Helena Parish	1,183	8.0	51.1%	38.0%	$1,764	$44,209
St. James Parish	3,595	14.1	93.7%	38.0%	$8,888	$59,604
St. John the Baptist Parish	5,810	11.3	76.1%	31.0%	$3,284	$49,861
St. Landry Parish	12,774	12.6	87.7%	23.5%	$1,048	$45,600
St. Martin Parish	7,496	13.2	96.6%	21.9%	$1,792	$52,841
St. Mary Parish	8,238	13.7	93.8%	29.5%	$2,833	$48,580
St. Tammany Parish	37,837	13.7	100.0%	37.2%	$3,679	$54,246
Tangipahoa Parish	19,447	11.3	80.0%	25.9%	$392	$47,271
Tensas Parish	400	11.9	32.3%	26.3%	$5,206	$39,572
Terrebonne Parish	16,874	13.4	83.2%	24.3%	$561	$49,749

District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Union Parish	1,944	12.2	84.3%	40.6%	$1,888	$48,717
Vermilion Parish	9,474	13.5	96.6%	22.8%	$1,271	$46,644
Vernon Parish	8,201	14.6	94.0%	23.6%	$1,030	$51,363
Washington Parish	5,070	12.1	87.8%	27.6%	$635	$44,457
Webster Parish	5,861	13.3	79.3%	29.0%	$2,241	$51,478
West Baton Rouge Parish	3,856	12.2	94.5%	29.1%	$6,984	$54,180
West Carroll Parish	1,944	14.0	97.2%	37.4%	$1,017	$51,003
West Feliciana Parish	2,168	13.6	88.2%	34.5%	$7,118	$54,819
Winn Parish	2,052	14.0	84.1%	22.5%	$1,137	$43,419
Zachary Community School District	5,463	12.3	99.1%	28.4%	$4,139	$55,779
Type 2 and 3B Charter Schools						
Abramson Sci Academy	660	5.0	17.8%	26.0%	$4,140	$54,920
Acadiana Renaissance Charter Academy	1,063	10.2	98.9%	27.5%	$2,143	$49,320
Advantage Charter Academy	536	6.0	49.2%	51.5%	$2,610	$50,375
Akili Academy of New Orleans	626	6.5	32.1%	39.5%	$4,140	$47,611
Apex Collegiate Academy Charter School	183	2.9	7.1%	0.0%	$0	$42,891
Arise Academy	478	5.2	22.7%	21.3%	$4,140	$55,095
Arthur Ashe Charter School	664	4.2	45.3%	20.4%	$4,140	$52,131
Athlos Academy of Jefferson Parish	1,111	9.1	38.8%	34.4%	$2,525	$50,020
Avoyelles Public Charter School	701	13.9	87.7%	27.0%	$0	$48,585
Baton Rouge University Preparatory Elementary	331	4.2	25.9%	12.9%	$0	$45,880
Belle Chasse Academy	921	12.1	98.3%	38.5%	$0	$56,941
Booker T. Washington High School	761	4.3	23.4%	30.0%	$4,140	$50,995
Collegiate Baton Rouge	371	3.2	18.6%	27.5%	$3,798	$49,518
Crescent City Leadership Academy	0	1.4	20.0%	20.0%	$0	$41,201
D'Arbonne Woods Charter School	951	9.4	81.5%	41.3%	$1,972	$50,980
Delhi Charter School	818	12.8	87.8%	45.5%	$0	$58,452

District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Delta Charter School MST	467	11.7	73.7%	43.2%	$1,826	$46,567
Dr. Martin Luther King Charter School for Sci Tech	882	13.5	62.4%	27.3%	$4,140	$50,536
Edgar P. Harney Spirit of Excellence Academy	228	13.8	54.5%	18.2%	$0	$46,550
Esperanza Charter School	761	11.1	36.7%	30.4%	$4,140	$47,424
Fannie C. Williams Charter School	535	15.8	62.3%	40.2%	$4,140	$51,849
GEO Next Generation High School	143	10.2	26.5%	41.2%	$3,817	$47,508
GEO Prep Academy of Greater Baton Rouge	630	6.4	34.2%	32.2%	$3,770	$52,114
GEO Prep Mid-City of Greater Baton Rouge	670	7.1	22.6%	38.3%	$3,820	$48,070
Greater Grace Charter Academy Inc.	74	12.6	50.0%	33.3%	$0	$42,516
Harriet Tubman Charter School	834	6.2	44.6%	31.9%	$4,140	$46,295
Iberville Charter Academy	397	8.9	72.3%	44.6%	$4,882	$51,470
Impact Charter School	386	5.2	11.1%	1.9%	$2,876	$44,045
International High School of New Orleans	445	7.0	50.8%	31.0%	$3,860	$48,275
International School of Louisiana	1,351	5.3	55.8%	31.8%	$0	$43,340
James M. Singleton Charter School	357	7.6	60.8%	28.4%	$4,140	$47,281
JCFA Lafayette	65	12.5	45.5%	72.7%	$2,156	$39,671
JCFA-East	221	10.6	29.3%	56.1%	$2,634	$46,841
John F. Kennedy High School	593	9.6	50.7%	34.9%	$4,140	$52,105
Joseph A. Craig Charter School	294	19.6	80.6%	36.1%	$4,140	$52,634
JS Clark Leadership Academy	239	12.0	30.2%	30.2%	$1,048	$46,632
Lafayette Renaissance Charter Academy	960	5.7	61.5%	16.8%	$2,079	$46,888

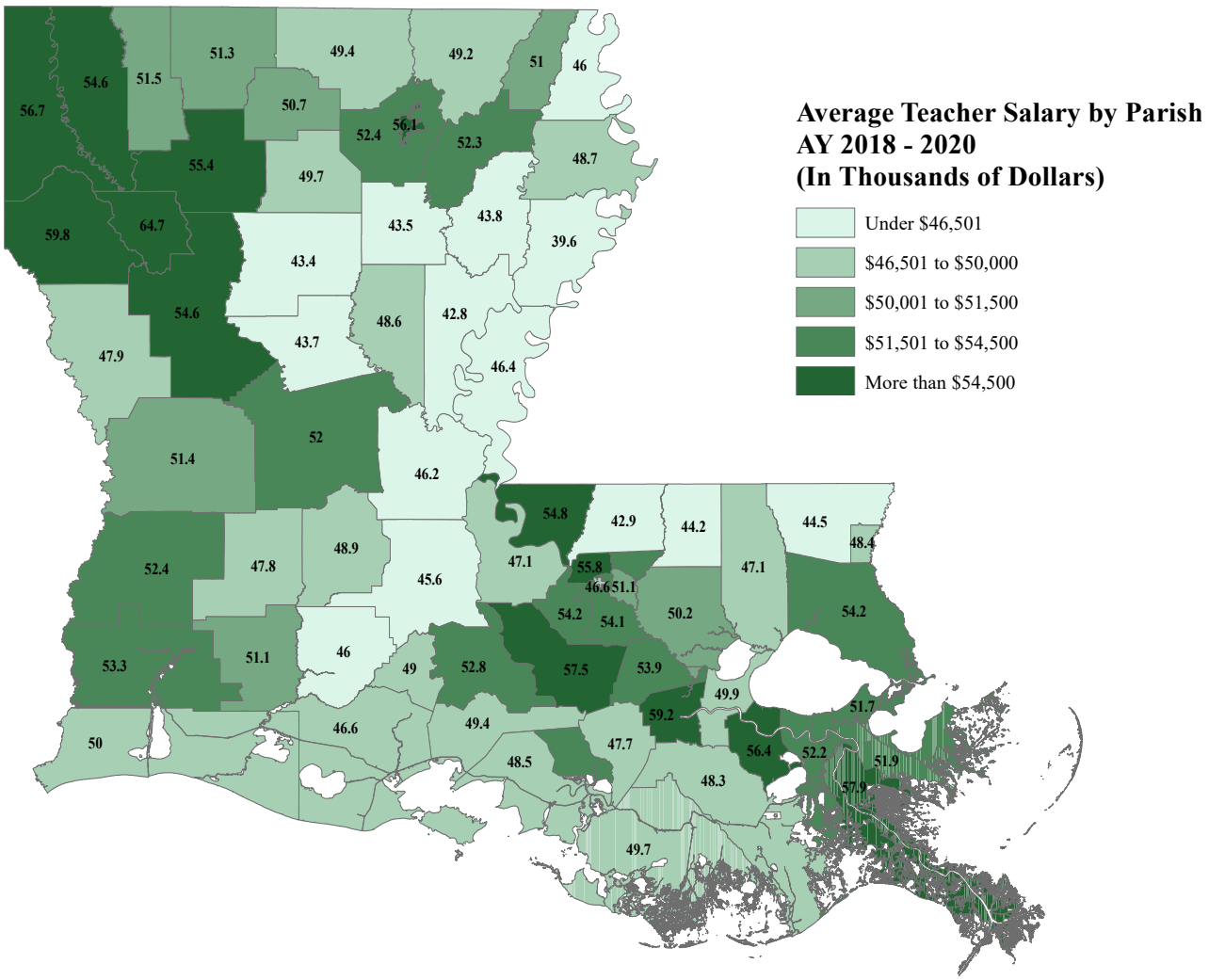
District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Lake Charles Charter Academy	914	5.9	56.2%	18.5%	$2,482	$50,368
Lake Charles College Prep	485	3.5	38.1%	36.1%	$2,483	$46,038
Laurel Oaks Charter School	92	7.2	22.2%	22.2%	$0	$24,659
Lawrence D. Crocker College Prep	367	3.5	20.9%	16.4%	$4,140	$50,383
Lincoln Preparatory School	500	9.4	59.1%	33.1%	$3,478	$49,107
Lord Beaconsfield Landry-Oliver Perry Walker High	679	8.0	46.2%	26.6%	$4,140	$44,119
Louisiana Key Academy	389	9.0	46.8%	22.0%	$3,714	$47,231
Louisiana Virtual Charter Academy	1,917	12.3	87.2%	60.1%	$2,529	$50,160
Lycee Francais de la Nouvelle-Orleans	982	9.9	63.4%	45.4%	$3,645	$50,115
Madison Preparatory Academy	571	11.6	57.4%	30.6%	$3,768	$55,230
Mary D. Coghill Charter School	578	11.9	41.8%	19.0%	$4,140	$55,127
Morris Jeff Community School	1,163	9.5	65.8%	47.9%	$4,140	$52,924
New Harmony High Institute	106	4.3	22.6%	22.6%	$4,009	$52,391
New Orleans Military & Maritime Academy	942	11.3	44.9%	46.7%	$2,826	$55,330
New Vision Learning Academy	278	21.0	76.9%	46.2%	$0	$62,137
Noble Minds	91	3.3	25.0%	43.8%	$4,012	$43,485
Northeast Claiborne Charter	182	16.8	100.0%	35.7%	$2,103	$47,271
Red River Charter Academy	234	8.4	36.4%	12.1%	$673	$44,463
ReNEW Accelerated High School	690	7.1	27.1%	34.3%	$4,140	$50,088
Smothers Academy Preparatory School	444	7.2	31.3%	28.1%	$0	$49,001

District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Sophie B. Wright Institute of Academic Excellence	489	6.4	25.0%	25.0%	$4,140	$54,323
Southwest Louisiana Charter Academy	658	5.2	59.3%	20.0%	$2,488	$48,727
Success Preparatory Academy	430	6.1	25.0%	17.3%	$4,140	$51,074
Tangi Academy	289	2.2	32.1%	10.7%	$0	$41,239
The MAX Charter School	120	8.0	86.5%	24.3%	$0	$42,571
The NET 2 Charter High School	144	7.7	18.9%	28.4%	$4,140	$46,509
University View Academy, Inc. (FRM LA Connections)	3,291	9.8	87.6%	41.8%	$2,398	$55,725
V. B. Glencoe Charter School	372	12.9	93.7%	23.2%	$0	$47,471
Vision Academy	153	19.1	0.0%	28.6%	$0	$48,357
Willow Charter Academy	605	7.5	48.2%	44.5%	$2,186	$46,937
Statewide Schools and Districts						
Louisiana School for Math Science & the Arts	329	11.0	0.0%	100.0%	$2,477	$62,598
LSU Laboratory School	1,425	15.1	100.0%	89.9%	$0	$67,649
New Orleans Center for Creative Arts	234	14.1	52.4%	63.6%	$3,757	$55,723
Recovery School District - Baton Rouge	2,095	4.7	21.1%	28.4%	$3,830	$50,692
Recovery School District - Louisiana	969	14.8	59.4%	43.1%	$3,677	$52,542
Southern University Lab School	307	9.0	62.4%	22.4%	$0	$49,791
Thrive Academy	172	7.7	40.3%	24.7%	$3,892	$58,347
Special School District						
Central Louisiana Supports and Services Center	39	10.1	100.0%	35.3%	$0	$75,151
LA Schools for the Deaf and Visually Impaired	192	12.2	93.0%	61.5%	$0	$56,486

District Name	Number of Students	Teachers' Average Years of Experience	Percent of Teachers who are Certified	Percent of Teachers with Graduate Degrees	Per Student Ad Valorem Tax (AY 2019-20)	Teachers' Average Salary
Office of Juvenile Justice - Secure Care Facilities	181	8.6	76.9%	43.3%	$0	$60,478

Note: Average salary amounts for each district in this appendix do not match the average salary amounts for each district reported in Appendix G because this appendix presents salary amounts for Type 2 charters, statewide schools and districts, and the Special School District separately.
Source: Prepared by legislative auditor's staff using PEP and MFP data from LDE

APPENDIX G: AVERAGE TEACHER SALARY BY SCHOOL DISTRICT AYS 2018-19 THROUGH 2020-21



Note: The district salary amounts in this exhibit include all public schools located in each district, including schools not operated directly by the district or a chartering organization authorized by the district, i.e., type 2 charters, Recovery School District schools, Louisiana School for Math, Sciences, and Arts, lab schools, Office of Juvenile Justice schools, and Thrive Academy.
Source: Prepared by legislative auditor's staff using data from LDE and school district boundaries from the U.S. Census Bureau.

APPENDIX H: AVERAGE TEACHER SALARY BY SCHOOL CHARACTERISTIC, AYS 2018-19 THROUGH 2020-21

Teachers' Average Annual Salaries by Urbanization Level	
Urbanization Level	**Average Annual Salary**
City-Outside New Orleans	$53,491
City-New Orleans	$51,414
Suburb	$50,974
Town	$52,272
Rural	$49,568
Missing/Not Available	$52,716
Total	$51,788
Source: Prepared by legislative auditor's staff using PEP data from LDE and the Common Core of Data (CCD) from the NCES.	

Teachers' Average Annual Salaries by School SPS Letter Grade	
SPS Letter Grade	**Average Annual Salary**
A	$53,491
B	$52,095
C	$50,735
D	$50,915
F	$51,419
T	$50,572
Missing/Not Available	$52,524
Total	$51,788
Source: Prepared by legislative auditor's staff using PEP and SPS data from LDE.	

Teachers' Average Annual Salaries by School Type	
School Type	**Average Annual Salary**
Traditional Public School	$51,924
Charter School	$50,692
Total	$51,788
Source: Prepared by legislative auditor's staff using PEP data from LDE and the Common Core of Data (CCD) from the NCES.	

Teachers' Average Annual Salaries by Percent of Students who are Economically Disadvantaged	
Percent of Students who are Economically Disadvantaged	**Average Annual Salary**
20% and Less	$59,283
20% to 40%	$54,428
40% to 60%	$53,000
60% to 80%	$51,030
More than 80%	$51,262
Missing/Not Available	$51,819
Total	**$51,788**
Source: Prepared by legislative auditor's staff using PEP and enrollment data from LDE.	

Teachers' Average Annual Salaries by VAM Rating AY 2018-19*	
VAM Rating	**Average Annual Salary**
Ineffective	$49,072
Emerging	$49,645
Proficient	$50,019
Highly Effective	$50,357
Missing/Not Available	$50,814
Total	**$50,616**
*VAM ratings were not available for AYs 2019-20 and 2020-21. **Source**: Prepared by legislative auditor's staff using PEP and VAM data from LDE.	

APPENDIX I: VALUE-ADDED MODEL REGRESSION RESULTS AY 2018-19

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective
Salary (in thousands)	0.00379***	0.00374***	0.00248**	0.00232**	0.00284**	0.00172	0.00203*
	-0.00069	-0.0007	-0.00087	-0.00087	-0.00089	-0.00096	-0.00097
1.Teaches at a school in the quintile with lowest economic disadvantage percentage (Base)		0	0	0	0	0	0
		(.)	(.)	(.)	(.)	(.)	(.)
2. Teaches at a school in the quintile with the second lowest economic disadvantage percentage		-0.0127	-0.0141	-0.0136	-0.0146	-0.0107	-0.0202
		(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0158)	(0.0158)
3. Teaches at a school in the quintile with the third lowest economic disadvantage percentage		-0.00775	-0.0104	-0.00916	-0.00872	-0.00597	-0.0225
		(0.0157)	(0.0157)	(0.0157)	(0.0157)	(0.0161)	(0.0163)
4.Teaches at a school in the quartile with the second highest economic disadvantage percentage		-0.0086	-0.00702	-0.00442	-0.00354	0.00332	-0.0209

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective
		(0.0157)	(0.0157)	(0.0157)	(0.0157)	(0.0162)	(0.0168)
5 Teaches at a school in the quintile with the highest economic disadvantage		-0.0039	0.00194	0.00906	0.0106	0.0286	-0.0106
		(0.0157)	(0.0157)	(0.016)	(0.016)	(0.0172)	(0.0187)
0. Has 0 - 2 years of experience (Base)			0	0	0	0	0
			(.)	(.)	(.)	(.)	(.)
2. Has 2-4 years of experience			0.0503**	0.0439*	0.0449*	0.0335	0.0313
			(0.0181)	(0.0183)	(0.0183)	(0.0191)	(0.0191)
5. Has 5-9 years of experience			0.0926***	0.0833***	0.0874***	0.0814***	0.0789***
			(0.0174)	(0.0179)	(0.018)	(0.0187)	(0.0186)
10. Has 10-19 years of experience			0.0685***	0.0584**	0.0602***	0.0576**	0.0515**
			(0.0173)	(0.0179)	(0.0179)	(0.0186)	(0.0186)
20. Has 20 or more years of experience			0.0714***	0.0617**	0.0618**	0.0667**	0.0581**
			(0.0204)	(0.0208)	(0.0208)	(0.0217)	(0.0218)
0. Is uncertified (Base)				0	0	0	0
				(.)	(.)	(.)	(.)
1. Is certified				0.0436*	0.0458*	0.0558*	0.0538*
				(0.0192)	(0.0193)	(0.0218)	(0.0218)
0. Does not have graduate degree (Base)					0	0	0
					(.)	(.)	(.)
1.Has graduate degree					-0.0314**	-0.0288*	-0.0271*
					(0.011)	(0.0113)	(0.0113)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective	Teacher is Effective-Proficient or Highly Effective
1. Teaches in a city school (Base)						0	0
						(.)	(.)
2. Teaches in a suburban school						-0.023	-0.0217
						(0.0161)	(0.0161)
3. Teaches in a town school						0.00967	0.025
						(0.0127)	(0.013)
4. Teaches in a rural school						-0.0152	0.00428
						(0.0149)	(0.0154)
Total Students							-0.0000771***
							(1.4E-05)
Constant	0.319***	0.328***	0.328***	0.301***	0.281***	0.327***	0.376***
	(0.0342)	(0.0377)	(0.0423)	(0.0438)	(0.0443)	(0.0472)	(0.0481)
N	10318	10314	10314	10314	10314	9898	9898

White-corrected standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
Source: Prepared by legislative auditor's staff based on analysis of data from LDE and NCES.