

## **Recruiting for School Improvement: The Relationship Between Teacher-Centric School Quality Factors and School Improvement Designations in Kentucky<sup>1</sup>**

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### **Abstract**

In 2018, Kentucky began the implementation of a new school accountability system. Like other states across the nation, Kentucky's new system was designed to bring state policy into alignment with federal changes brought about by the Every Student Succeeds Act (ESSA) of 2015. In addition to the creation of new school improvement labels, Kentucky's system also reports on a variety of teacher-centric school quality factors. A statistical analysis was conducted to determine if a relationship exists between these school quality factors and the school's improvement designation. The study found that schools identified as needing the greatest improvement (Comprehensive Support and Improvement [CSI]) are statistically more likely to have higher teacher turnover rates, higher percentages of new teachers, and employ teachers with lower rates of advanced education in the year prior to identification than their counterparts with either the Targeted Support and Improvement (TSI) or Other designations. These findings should inform future policy making and elevate teacher recruitment and retention as a school improvement priority.

**Keywords:** school improvement, teacher recruitment, teacher retention

**DOI:** 10.29329/epasr.2019.201.4

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<sup>1</sup> This work does not reflect the official stance of the Kentucky Department of Education.

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## Introduction

In 2015, the United States Congress passed the Every Student Succeeds Act (ESSA) which provided new guidance and expectations for states related to school accountability models, more specifically, state school improvement models. Two years later, the Kentucky General Assembly passed Senate Bill 1 2017; a sweeping reform that sought to align standards, assessment, accountability, and school improvement with the ESSA. With this, the Kentucky Department of Education recommitted itself to ensuring a meaningful and high quality education for all students and set forth to create new regulations and procedures related to accountability and school improvement.

Kentucky began implementing its new accountability system in the fall of 2018. In alignment with the ESSA, Kentucky's new system includes two school improvement labels: Comprehensive Support and Improvement (CSI) and Targeted Support and Improvement (TSI). Schools not identified as either CSI or TSI were identified as Other. At the time of this writing, Kentucky is working through the process of dividing the "Other" category into new, more specific labels.

In 2018, a school could be identified as CSI if it was among the lowest performing five percent (5%) of Title I or Non-Title I schools by level, or if it is a Title I or Non-Title I school with a four-year graduation rate of eighty percent (80%) (KRS 160.346). The identification criteria for the TSI designation is similar to that of the CSI designation with the exception that the analysis is applied to a sub-population of students. In 2018, a school could be identified as TSI if it had one or more subgroups performing as poorly as all students in any of the lowest performing five percent (5%) of Title I or Non-Title I schools by level (KRS 160.346). Kentucky's accountability system also includes additional criteria for the identification of TSI and CSI schools that will not go into effect until 2020.

Kentucky used a combination of three accountability indicators to determine which schools fell below the bottom five percent (5%) of all schools. For elementary and middle schools, Kentucky utilized a proficiency indicator (reading and math), a separate academic indicator (other tested areas), and a growth indicator. High school indicators included a proficiency indicator (reading and math), a graduation rate indicator, and a transition readiness indicator (703 KAR 5:240). A standard setting committee used these indicators to establish cut scores and relative weights to determine where the five percent (5%) threshold used for the TSI and CSI designations would lie.

For the purpose of this study, it is important to note that only student-centric metrics were used to compile the aforementioned accountability indicators. While these metrics are important outcome measures, an examination of the input measures is key to diagnosing the effects of low school performance. Kentucky reports on a wide variety of input measures including information about student and teacher demographics, student access to advanced coursework and career and technical education courses, and details about school facilities. This study will focus its attention on a variety of teacher-centric school quality factors reported by the Kentucky Department of Education.

Over the past ten years, the role of the teacher in student success has been heavily studied. It is generally well accepted that quality teaching can have a significant impact on student growth (Daling-Hammond, 2000; Sanders & Rivers, 1996; Wright, Horn & Sanders, 1997; Hattie, 2009). This understanding is deeply rooted in education policy and has informed teacher evaluation systems across the country. Value-added evaluation systems, for example, work by using regression modeling to try to determine teacher effectiveness by measuring a teacher's influence on a student's academic growth (Hawley, Bovaird & Wu, 2017). Other qualitative frameworks, such as Danielson's "Framework for Teaching", attempt to evaluate teacher effectiveness by examining the practices underway in a given classroom (Danielson, 1996). Regardless of model, the underlying assumption is that quality teaching leads to greater results in student achievement.

While there is little debate about the importance of teacher quality, the specific factors that contribute to teacher quality are still being discussed. Teacher credentials are often pointed to as a concrete measure – working under the assumption that better preparation leads to better performance. Generally, research has shown a positive correlation between teacher credentials and student performance (Curry, Reeves, McIntyre, & Capps, 2018; Clotfelter, Ladd, & Vigdor, 2010; Clotfelter, Ladd, & Vigdor, 2007). National Board Certification is an often cited credential that appears to have a positive correlation to increased student outcomes (National Board of Professional Teaching Standards, 2019). Access to teachers with higher levels of professional credentials seems to be another commonly accepted predictor of student success.

It does not matter how high quality a teacher is, or how many formal qualifications they have, if they are not in the classroom in the first place. Teacher attrition, both from the school and the profession, is another heavily studied issue (Buchanan, 2012; Gardner, 2010; Foster, 2010; Kelly, 2004; Shen, 1997; Latifoglu, 2016; Edwards & Nuttall, 2015; Boe, Cook & Sunderland, 2008; Hahs-Vaughn & Scherff, 2008p; Dupriez, Delvaux, & Lothaire, 2016, Mee & Haverback, 2014; Cancio, Albrecht, & Johns, 2013; Hochstetler, 2011; DeMik, 2008; Wang Changying, 2007). This research generally assigns the attrition issue to one of two camps. The first suggests that teachers leave the field due to leadership and administrative burdens. The other suggests that attrition is due to teaching hardships and a general lack of skill, preparation, or support. Whatever the reason, it is clear that teacher retention and longevity is important to school improvement.

A recent study focusing on middle school students found a strong connection between the teacher's years of experience and both an increase in test scores and a decrease in student absenteeism (Ladd & Sorensen, 2017). Roby (2013) explored the role that teacher absenteeism plays on student achievement and found that the lowest performing schools in Ohio had a statistically significant higher rate of teacher absenteeism than the highest performing schools in the same state. Finally, Ronfeldt,

Loeb, and Wyckoff (2013) found in a study of over 850,000 New York City students that high rates of teacher turnover lead to lower scores in both English/language arts and math achievement.

Given what is known about the important role that teachers play in the success and continued growth of students, it stands to reason that an examination of teacher-centric school quality factors would provide insight into the staffing concerns of schools in need of improvement. This study seeks to determine the statistical effect of the teacher-centric school quality factors reported by the Kentucky Department of Education on school improvement designations under Kentucky's school accountability model in an effort to inform future policy decisions related to teacher recruitment and retention in low performing schools.

### **Methodology**

This study utilized inferential statistics to measure the degree of relationship between a variety of teacher-centric school quality factors and school improvement designations under Kentucky's accountability system. The data for this study was retrieved from the Kentucky Department of Education's Open House (Kentucky Department of Education, 2019). Open House is a publically available data portal that provides researchers with a variety of data sets related to school accountability.

The researcher began by identifying the teacher-centric school quality factors that are reported in Kentucky's accountability system. Those factors include the following: the number of National Board Certified Teachers, the number of first year teachers, the percentage of teachers holding various degrees, the teacher turnover rate, the percentage of teachers holding provisional or emergency certifications, and the average years of teaching experience among the faculty. School improvement labels were also retrieved from the Open House system. In 2018, Kentucky utilized three school improvement labels, Comprehensive Support and Improvement (CSI), Targeted Support and Improvement (TSI), and Other. The relevant data points were pulled from the 2017-18 data sets and sorted for analysis.

The R statistical package was employed to conduct the analysis (R Core Team, 2013). R is a statistical language and processing environment that is used to effectively process large amounts of data. To identify relationships a series of ANVOA and post-hoc Tukey HSD tests were conducted.

### **Results**

The results of this study indicate that schools designated for Comprehensive Support and Improvement (CSI) are more likely to have higher teacher turnover rates, higher percentages of new teachers, and lower rates of advanced education than their counterparts with either the Targeted Support and Improvement (TSI) or Other designations. Table 1 presents the means for each of the identified school quality factors and the school improvement designation.

<b>School Quality Factor</b>	<b>CSI</b>	<b>TSI</b>	<b>Other</b>
Teacher Turnover Rate	23.35%	16.8%	15.41%
Average Years of Experience	8.84	11.63	12.46
Percent of Emergency/Provisionally Certified Teachers	1.39%	0.86%	0.81%
Percent of New Teachers	11.24%	6.77%	6.28%
Number of National Board Certified Teachers	1.6	2.9	2
Percent of Teachers with Associates' Degrees	0.06%	0.26%	0.12%
Percent of Teachers with Bachelor's Degrees	32.76%	22.48%	23.18%
Percent of Teachers with Master's Degrees	47.88%	45.56%	48.84%
Percent of Teachers with Doctorate Degrees	0.61%	0.33%	0.20%
Percent of Teachers with a Rank I	17.09%	26.81%	29.55%

While this conclusion can be drawn based on the means alone, further statistical analysis was conducted to measure the rate of significance of the differences between the means above. Of the eleven school quality factors studied, nine of them included statistically significant findings. Two school quality factors, the percentage of teachers with Specialist Degrees and the percentage of teachers with emergency or provisional certifications were not statistically significant. The findings for each statistical comparison are presented below:

- There is a statistically significant effect of the rate of teacher turnover on the school improvement designation, [ $F(2, 1267) = 20.51, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the CSI group ( $M=23.35$ ) differed significantly from the TSI ( $M=16.8$ ) and Other ( $M=15.41$ ) groups at  $p < 0.001$ , while the TSI group differed significantly from the Other group at  $p < 0.05$ .
- There is a statistically significant effect of the average years of teaching experience on the school improvement designation, [ $F(2, 1267) = 63, p < 0.001$ ]. The post hoc Tukey HSD test indicated that all three groups differed significantly from one another at  $p < 0.001$  (CSI  $M = 8.84$ , TSI  $M = 11.63$ , Other  $M = 12.46$ ).
- There is a statistically significant effect on the percentage of new teachers on the school improvement designation [ $F(2, 1267) = 18.02, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the CSI group ( $M = 11.24$ ) differed significantly from both the TSI ( $M = 6.77$ ) and Other ( $M = 6.28$ ) groups at  $p < 0.001$ , while the TSI group did not differ significantly from the Other group.
- There is a statistically significant effect on the number of NBCT teachers in a building on the school improvement designation [ $F(2, 1267) = 17.72, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the TSI group ( $M = 2.87$ ) differed from the Other group ( $M = 2$ ) at  $p < 0.001$  and the CSI group ( $M = 1.61$ ) at  $p < 0.01$ , while the CSI group and the Other group did not differ significantly.
- There is a statistically significant effect on the percentage of teachers with Associates' Degrees on the school improvement designation [ $F(2, 1267) = 5.41, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the TSI group ( $M = 0.00063$ ) differed significantly from the

Other group ( $M = 0.00123$ ) at  $p < 0.01$ , but did not differ from the CSI group ( $M = 0.00256$ ). The CSI and Other groups did not differ significantly from one another.

- There is a statistically significant effect on the percentage of teachers with Bachelor's Degrees on the school improvement designation [ $F(2, 1267) = 19.45, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the CSI group ( $M = 0.33$ ) differed significantly from the TSI group ( $M = 0.22$ ) and the Other group ( $M = 0.23$ ) at  $p < 0.001$ , while the TSI group did not differ significantly from the Other group.
- There is a statistically significant effect on the percentage of teachers with a Master's Degree on the school improvement designation [ $F(2, 1267) = 11.1, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the TSI group ( $M = 0.49$ ) differed significantly from the Other group ( $M = 0.46$ ) at  $p < 0.001$  and did not differ significantly from the CSI group ( $M = 0.48$ ). The CSI group did not differ significantly from the Other group.
- There is a statistically significant effect on the percent of teachers with Doctorate Degrees on the school improvement designation [ $F(2, 1267) = 7.24, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the CSI group ( $M = 0.006$ ) differed from the Other group ( $M = 0.002$ ) at  $p < 0.01$  and did not differ from the TSI group ( $M = 0.003$ ). The TSI group and the Other group did not differ significantly.
- There is a statistically significant effect on the percent of teachers with a Rank I on the school improvement designation [ $F(2, 1267) = 26.11, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the CSI group ( $M = 0.17$ ) differed from the TSI group ( $M = 0.27$ ) and the Other group ( $M = 0.3$ ) at  $p < 0.001$  while the TSI group differed from the Other group at  $p < 0.01$ .
- There is not a statistically significant effect on the percent of teachers with a specialist degree [ $F(2, 1267) = 0.71, p = 0.492$ ].
- There is not a statistically significant effect of the percentage of teachers with emergency or provisional certifications on the school improvement designation, [ $F(2, 1267) = 2.022, p = 0.133$ ].

An anomaly in the data shows that schools with the CSI designation have a statistically higher rate of teachers with Doctorate Degrees than the other two designations and a higher rate of teachers with a Master's Degree than TSI schools while having the lowest rate of teachers with a Rank I. There are multiple ways that a teacher can earn a Rank I with the two most commonplace being a post-master's degree certificate program or National Board Certification. To examine this anomaly, an additional analysis was performed. The variables *percent of Master's Degree*, *percent of Education Specialist Degree*, *percent of Rank I*, and *percent of Doctorate Degree* were combined for this analysis (the Kentucky Department of Education does not duplicate teachers within these captions). An ANOVA of this combination found a statistically significant effect on advanced training on the school

improvement designation [ $F(2, 1267) = 18.83, p < 0.001$ ]. The post hoc Tukey HSD test indicated that the CSI group ( $M = 0.67$ ) differed from the TSI and Other groups at  $p < 0.001$  while the TSI ( $M = 0.77$ ) and Other ( $M = 0.77$ ) groups did not differ from one another.

### **Discussion**

This study set out to measure the relationship between teacher-centric school quality factors and school improvement designations under Kentucky's school accountability system. The statistical analysis outlined in this paper demonstrates that schools identified as needing intensive support (Comprehensive Support and Improvement or CSI) are far underperforming their peers on most teacher-centric metrics. While an analysis such as this cannot make a causal inference, the level of statistical significance described above suggest that teacher recruitment and retention efforts should be classified as a school improvement priority and carefully considered by education leaders and policy makers.

The school quality factors discussed in this paper can be divided into three segments: teacher turnover, teacher experience, and teacher training. These three elements are interrelated and all three of these elements play an important role in the staffing and performance of a school.

One of the most striking relationships outlined in the analysis is the one between teacher turnover and the CSI designation. A school with a CSI designation lost, on average, nearly a quarter of the teaching staff in the year before the designation was made. As was discussed in the introduction, the consistent turnover of a teaching staff can have extremely detrimental effects on student outcomes. Teacher retention is directly related to the next category of school quality factor; teacher experience. It is clear from the data presented here that CSI schools are staffed by professionals with a lower level of prior experience. A student in a CSI school, is much more likely to have a teacher who is within their first ten years of experience than a student in an otherwise identified school. The same student is also nearly twice as likely to have a teacher who is in their first year of teaching than a student at another school.

Perhaps not surprisingly, the data also shows that the teaching staff at a CSI school also have lower credentials than at otherwise identified schools. It stands to reason that if you have a staff with high turnover and low experience that you would also see lower levels of professional qualifications as the staff members have not had the time to earn higher credentials. The traditional licensure route in Kentucky begins with a Bachelor's Degree for initial licensure and requires teachers to earn their Master's Degree within the first ten years of teaching (16 KAR 2:010). In addition to the Master's Degree requirement, Kentucky teachers can also earn pay increases, called Ranks, by earning additional credentials beyond the Master's Degree. When all graduate work is pooled together for analysis, teachers in CSI schools maintain a statistically significant lower level of educational

attainment. These realizations must shape and inform both the moral imperative and philosophical approach of school improvement.

The data presented in this study clearly demonstrates that quantitative measures of teacher quality matter and that a dramatic inequity exists in Kentucky's public school system. Students from low-performing schools do not have access to the same level of teacher quality as students in high performing schools. As Kentucky seeks to build and maintain a competitive economic market and workforce they must ensure that every student has access to experienced, credentialed, and high quality teachers who engage in continued professional growth and learning throughout their careers.

Recruitment and retention programs should be deployed to attract and keep teachers at high need schools. Kentucky has made some strides in this area in recent years. In 2018, the Kentucky General Assembly passed Senate Bill 152, which allows districts to offer incentive pay for the purpose of attracting and retaining experienced teachers into low performing schools. The law requires that this incentive be in addition to the compensation provided in the single salary schedule and granted to all teachers employed in a school that is identified as being in either Targeted or Comprehensive Support and Improvement (TSI or CSI) status (KRS 157.390).

Jefferson County Public Schools, the state's largest school district, was the first to take advantage of this provision by adding recruitment and retention bonuses into their negotiated teaching contract. The agreement between the Jefferson County Board of Education (JCBC) and the Jefferson County Teachers Association (JCTA) (heretofore referred to as the contract) provides a minimum quarterly stipend of four hundred dollars (\$400) to teachers serving in a CSI school. This stipend increases after five consecutive years of service in a low performing school (as defined by the teacher contract). Additionally, the contract provides a signing bonus of one thousand dollars (\$1000) to any teacher with eight or more years of experience in a high performing school (as defined by the contract) who transfers into a low performing school. The contract also allows for the reimbursement of fees associated with National Board Certification for any certified teacher who serves three full school years following their certification. Additionally, the contract requires the district to provide five additional days of paid professional learning and the exploration of scheduling options to allow for additional job embedded training for teachers (JCBE-JCTA Agreement).

Together, these two steps provide a model of policy implementation that reflects the findings shown in this study. The Kentucky General Assembly played its role in opening up the options to allow for effective policy at the local level. The local education agency (JCBE) then worked in collaboration with the teachers union (JCTA) to develop a contract that took advantage of the local flexibility offered by the state. The contract language has three primary objective that are relevant to this study. First, the contract seeks to retain teachers in the building by increasing the stipend amount for teachers by one hundred dollars (\$100) after five consecutive years of service. This encourages



longevity in the staff. If a teacher in a CSI school in JCPS were to transfer into a CSI school, they would receive an additional one thousand two hundred dollars (\$1,200) each year for their service. After five years, that increases to one thousand six hundred dollars (\$1,600) and after ten years the stipends would amount to two thousand dollars (\$2,000) of additional pay. The data presented in this study states that teachers in a school designated as “Other” have an average of 12.46 years of experience. By incrementally increasing teacher pay over the course of ten years, the contract language encourages teachers to stay in the building and gain the additional experience needed for the CSI school to reach benchmarks set by the otherwise designated schools. It should be noted here that the contract is only for a five year period and will renegotiated before these retention incentives will be realized.

The contract also encourages the up-skilling of educators in low performing schools by emphasizing both formal and informal training opportunities. By reimbursing teachers for achieving National Board Certification, for example, the contract is encouraging teachers to pursue additional credentials that have been proven effective in increasing student achievement. The language related to National Board Certification also promotes teacher retention by requiring three years of service before the reimbursement is made. Additionally, the inclusion of paid professional learning time reflects the literature cited earlier in this paper.

Another way that the contract encourages longevity is through a signing bonus for teachers who transfer into a low performing school from a high performing school. This bonus applies to only to teachers with eight or more years of experience with the hope that they will bring their understanding of instructional systems to help inform the turnaround process at the low performing school. This stipend also includes a two year period of service in the low performing school. This recruitment bonus is likely to be a major attraction for teachers in other buildings within the district.

While this policy effort takes a step in the right direction, this data would suggest that other teacher credentials should added to the recruitment and retention bonuses. There are currently no connections to graduate coursework in the contract – presumably due to the requirement that teachers earn a Master’s degree within ten years of teaching in Kentucky for certificate renewal. It is, however, possible that teachers with eight years of experience could transfer into a low performing school and not yet have the additional training that this research suggests is necessary. Additionally, while the contract ensures additional paid professional learning days, there is no guarantee that teachers will continue to grow on individual professional goals. The contract language would be strengthened by including a requirement that continuing education, such as work towards a Master’s, Specialist, or Doctorate degree be included in the standard four hundred dollar (\$400) stipend for all teachers (JCBE-JCTA Agreement).

The contract language could be further strengthened by including special provisions for the support of new, first year teachers in low performing schools. Kentucky's certification process includes a first year experience program called the Kentucky Teacher Internship Program (KTIP) whose success and continuation depend on funding from the Kentucky General Assembly. While this requirement applies to all teachers, those first year teachers assigned to low performing schools have an urgent need for up-skilling and support. Future contract negotiations would benefit from a discussion of support for these teachers who will experience unforeseen hardships that teachers in high performing schools may not experience.

As districts across the state struggle to attract and retain teachers in low performing schools, they would do well to reflect upon the policy arrangement presented here. Both JCBE and JCTA collaborated in good faith to create a contract that fully utilized the local autonomy granted to them by the Kentucky General Assembly. The recruitment and retention incentives included within align with the data presented in this study, and with some minor adjustments, account for all of the teacher-centric school quality factors reported by the Kentucky Department of Education.

Future research is needed to gather more information about the relationship, and potential causal link, between the identified teacher-centric school quality factors and student achievement. While this study reviewed only three broad school improvement identifications, future studies should examine the link between these factors and the additional accountability labels Kentucky will implement in the future. Additionally, non-parametric matching could be used to simulate an experimental study condition and compare school performance based on the identified factors studied in this paper.

It will also be necessary for future researchers to examine the current JCBE-JCTA Agreement and its impact on teacher recruitment and retention in low performing schools within the district. Should this data hold true, one would expect to see that this policy language both attracts and retains experienced teachers and contributes to long term and sustainable school improvement. A future data analysis in five and ten years' time will help to verify these preliminary findings regarding the importance of teacher-centric school quality factors.

In conclusion, the intentional and thoughtful recruitment of high quality teachers must become a top improvement priority for schools identified as needing improvement. These recruitment policies must be informed by the data and should reflect each of the teacher-centric school quality factors identified in this study. In order to achieve lasting improvement, high quality teachers must be employed, trained, and retained for the good of the school and the children it serves.

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