



Legislative Research Commission

Tracking Teacher Shortages: Trends And Continuing Questions

Research Report No. 395

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Frankfort, Kentucky
lrc.ky.gov

Accepted October 29, 2012, by the
Education Assessment and Accountability Review Subcommittee

Paid for with state funds. Available in alternative format by request.

Foreword

In December 2011, the Education Assessment and Accountability Review Subcommittee directed the Office of Education Accountability (OEA) to conduct research on teacher shortage areas in the commonwealth. The committee also requested that OEA distinguish between critical and less critical shortage areas and discuss Kentucky's method for determining shortage.

The Office of Education Accountability would like to thank staff at the Education Professional Standards Board, Kentucky Department of Education, Kentucky Higher Education Assistance Authority, and Kentucky Higher Education Student Loan Corporation for their assistance with this report.

Robert Sherman
Director

Legislative Research Commission
Frankfort, Kentucky
October 2012

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Summary

This study looks at trends in shortages of certified teachers in the last decade and uses recent teacher preparation and employment patterns to anticipate shortages that may exist in the future. Teacher shortages occur when the demand for teachers with specific types of teaching certificates exceeds the supply of those teachers who are available and willing to teach. Certification is widely considered a necessary first step in ensuring teacher quality. When shortages occur, students may be taught by teachers who lack the knowledge and skills necessary to be effective in the positions they are filling.

Teacher shortages were limited in 2012 and have declined substantially in the last decade. The most direct shortage indicators—teaching positions that are unfilled or that are filled by teachers possessing emergency certificates—were less than one-half of 1 percent of teaching positions in 2012. These indicators exceeded 1 percent of all teachers in the areas of chemistry and English as a second language only. The total number of emergency certificates issued annually in all content areas has declined in the last decade, from 1,432 in 2001 to 191 in 2012. This trend is associated with an almost equivalent increase in the number of teachers becoming certified through one of eight alternative certification routes established by the General Assembly. These routes allow qualified individuals to begin teaching while they are fulfilling the requirements for full certification.

Positions filled by teachers becoming certified through alternative routes do not necessarily indicate shortages of fully certified teachers; by Kentucky law, a district can fill a vacant position with a teacher pursuing alternative certification regardless of whether and how many fully certified teachers apply for the position. The increase in numbers of teachers becoming certified through alternative routes may suggest a need for greater attention to early career mentoring and support, however. Approximately one-fifth of first-year teachers are in the process of pursuing alternative certification. Teachers in some alternative certification programs can begin teaching prior to demonstrating pedagogical skill or knowledge relevant to their position. The percentage of teachers becoming certified through alternative routes is highest in the areas of exceptional children, secondary science, and world languages.

The number of candidates completing degree programs leading to certification in some areas versus others is disproportionate to the demand for these teachers. In the areas of secondary science and English as a second language, less than one candidate becomes certified for every vacancy anticipated. Shortages in these areas are likely to be greater in the future. Twice as many teachers are completing degree programs each year in middle school math as in secondary math despite a roughly comparable demand for each.

The state has made little progress in meeting the General Assembly's goal of recruiting and retaining a diverse teaching workforce. For at least the last decade, the percentage of students who are minorities has been more than four times as great as the percentage of teachers who are minorities. Minority candidates are underrepresented in teacher preparation programs compared to the state's student population.

The state has two scholarship programs that could be targeted more directly at candidates likely to enter teaching in shortage areas: the Minority Educator Recruitment and Retention Scholarship and the Teacher Scholarship program. Additional data would be helpful to inform these programs or other initiatives directed at addressing teacher shortages in specific content areas or regions. While much of the data necessary to track teacher supply and demand data can be found in existing sources, there is no single entity responsible for analyzing and reporting the data. Certain types of data, such as the number of teachers currently employed in different content areas, are not easily available.

Research has documented substantial variation in effectiveness among certified teachers. Data presented in this report suggest that in Kentucky, as in the nation, effective teachers may not be equally distributed among schools. Teachers who are certified by the National Board for Professional Teaching Standards (NBPTS) are considered, on average, to be more effective than other teachers. NBPTS-certified teachers in Kentucky are more likely to teach in schools serving lower percentages of students living in poverty than in schools serving higher percentages of students living in poverty. Teachers with less than 3 years of experience are considered, on average, to be less effective than other teachers. In Kentucky, inexperienced teachers are more likely to be teaching in schools serving high percentages of minority students and students living in poverty than in schools serving low percentages of minority students or students living in poverty.

The report makes three recommendations:

Recommendation 1.1

The Kentucky Department of Education should consider modifying requirements for the Minority Educator Recruitment and Retention data that districts submit annually. The department could generate district minority staffing profiles from data already submitted by districts through Professional Staff Data. Districts could continue to submit plans documenting efforts to recruit and retain minority teachers.

Recommendation 2.1

The Kentucky Department of Education should set guidelines that target Minority Educator Recruitment and Retention scholarships more directly at applicants likely to teach in Kentucky public schools.

Recommendation 2.2

If it is the intent of the General Assembly to provide funding for programs designed to address teacher shortages, it should consider directing a specific agency or entity to be responsible for periodically analyzing and reporting teacher supply and demand data in the commonwealth.

Chapter 1

Teacher Shortage Indicators: Trends And 2012

Introduction

Effective teachers benefit student learning more than any other in-school factor does. Teacher certification is widely considered an important first step in ensuring that teachers have the knowledge and skills necessary to be effective. Kentucky teachers must possess certificates appropriate to the content area or grade they are filling. Teachers must also have specific certificates to teach English language learners or children in special education or gifted programs.

Teacher shortages occur when the demand for teachers to fill particular positions exceeds the supply of teachers who are appropriately certified and willing to fill those positions. When this happens, teaching positions are unfilled or they are filled by teachers who do not necessarily possess the content or pedagogical knowledge relevant to teach a particular subject.

This study looks at whether the supply of certified teachers in the commonwealth is meeting the demand for those teachers in particular content areas. The study also compares projected demand for teachers in particular content areas with the number of teachers currently being prepared to teach in those areas.

Major Conclusions

This study has seven major conclusions:

Teacher shortages as measured by emergency certificates issued have dropped substantially in the last decade. During this period, the number of teachers pursuing certification through alternative routes has increased sharply.

The most common alternative route does not require teachers to demonstrate content or pedagogical knowledge prior to employment though some individual alternative programs set their own requirements.

1. Teacher shortages as measured by the most direct indicators—unfilled positions and emergency certificates—were limited in 2012. The number of emergency certificates issued has dropped substantially in the last decade. During this period, the number of teachers in the process of pursuing certification through alternative routes has increased sharply.
2. The most common alternative route—the university-based option—does not require pedagogical training or demonstration of content knowledge prior to employment as a teacher. Candidates can begin teaching as soon as they are accepted into an approved certification program. Some but not all university-

based programs set content-specific knowledge and skill requirements for program admission.

Two indicators raise concerns about the distribution of effective teachers among schools in the state.

3. Two indicators raise concerns about the distribution of effective teachers among schools in the state. Teachers certified by the National Board for Professional Teaching Standards are more likely to teach in schools serving lower percentages of students living in poverty. Schools with higher percentages of teachers with less than 3 years of experience are more likely to serve poor and minority students than are other schools.

The statewide demand for teachers needed to fill annual vacancies is created primarily by the 8 percent of all teachers annually who do not teach in the subsequent year. While most of these positions are filled by new teachers, many are filled by teachers returning to teaching or moving from other states.

4. The statewide demand for teachers needed to fill vacancies is created primarily by the 8 percent of all teachers annually who do not teach in the subsequent year. Vacancies are created by teachers who retire (2 percent of all teachers), become administrators (1 percent of all teachers), or leave Kentucky public schools, at least temporarily (5 percent of all teachers). While these percentages may change in the future, they were consistent between 2008 and 2012. The 8 percent of positions that are vacant each year are filled by teachers who are new to the profession (5 percent) and teachers who are returning to teaching or moving from other states (3 percent).

Teacher supply and demand data are not closely tracked in the commonwealth. It appears that disproportionate numbers of teachers are completing degree programs leading to certification in some areas versus others.

5. It appears that disproportionate numbers of teachers are completing degree programs leading to certification in some areas versus others. For example, twice as many teachers are completing degree programs each year in middle school math as in secondary math. The number of teacher candidates completing programs in secondary science and English as a second language appears insufficient to meet the demand for these teachers in coming years.

There is no single state agency responsible for collecting and analyzing teacher supply and demand data, and some data are not easily accessible from a single source.

6. Education data sources in the commonwealth were not designed to track teacher supply and demand. While much of the necessary data exists, some—such as annual counts of teachers by content area—is not possible to access from a single data source. No single entity is responsible for collecting and analyzing teacher supply and demand data.

Scholarships awarded in two state programs might benefit from being targeted more directly at candidates likely to enter teaching and teach in areas of greatest need.

7. The state has two programs that provide financial assistance to applicants who are enrolled in teacher education programs or who declare education as a major field of study. Scholarships awarded in these programs might benefit from being targeted more directly at candidates who are likely to enter teaching and teach in areas of greatest need.

Description Of This Study

In December 2011 the Education Assessment and Accountability Review Subcommittee directed the Office of Education Accountability (OEA) to conduct research on teacher shortage areas in the commonwealth.

In December 2011 the Education Assessment and Accountability Review Subcommittee directed the Office of Education Accountability (OEA) to conduct research on teacher shortage areas in the commonwealth. In particular, the committee requested that OEA provide information on the supply, geographic distribution, and employment trends of teachers by content area and certification type. The committee also requested that OEA distinguish between critical and less critical shortage areas and discuss Kentucky's method for determining shortage.

Data used for this study come primarily from the Kentucky Department of Education (KDE) and the Education Professional Standards Board (EPSB). KDE's Professional Staff Data (PSD) allowed tracking of teachers to individual school locations and tracking of teacher employment patterns over time. Staff used EPSB data on certificates held by working teachers to identify teachers working with certificates that are considered shortage indicators, and to identify total numbers of teachers holding certificates in each content area. The Kentucky Higher Education Assistance Authority (KHEAA) provided data on scholarships awarded through the teacher scholarship fund and the minority educator recruitment and retention fund. Program directors at KDE, EPSB, and KHEAA assisted staff in understanding data and providing context on current and historical teacher shortage issues.

Organization Of The Report

Chapter 1 tracks changes over time in emergency and alternative certificates, two indicators included in calculations of teacher shortage. The chapter also describes current teacher shortages in the commonwealth using indicators proposed by the United States Department of Education. Data on the number of teachers becoming certified in each of Kentucky's eight alternative routes are reported, and requirements placed on teachers entering through different routes are discussed. After describing continuing shortages of minority teachers, the chapter concludes with data on the distribution among Kentucky schools of teachers who are believed to be, on average, more effective—those with National Board of Professional Teaching Standards certification—and, on average, less effective—those with less than 3 years of teaching experience.

Chapter 2 provides data on factors that influence the supply of and demand for teachers to fill annual vacancies in the commonwealth. Teacher employment patterns are described overall and by teachers' years of experience. The number of candidates completing programs leading to certification in different content areas is compared to the number of vacancies anticipated in those areas. Chapter 2 also describes existing teacher shortage policies in the commonwealth and provides examples of policies in other states.

Measuring Teacher Shortages

Teacher shortage calculations conducted annually by the Kentucky Department of Education are based on federal methods that allow states to count teachers with irregular or temporary, provisional certificates as indicators of shortage.

Teacher shortages are most often calculated by counting unfilled positions and positions filled by teachers who are not considered appropriately certified for the positions they are filling. In order to measure teacher shortages, it is thus first necessary to identify which indicators suggest a shortage of appropriately certified teachers. Teacher shortage calculations conducted annually by KDE as required by the US Department of Education are based on federal regulations. These regulations require states to report shortage areas based on the number of teaching positions that are unfilled or that are filled by irregular, provisional, temporary, or emergency certified teachers.¹ This definition implies that the certificates stated indicate a shortage of more appropriately certified teachers.

Teachers with irregular or provisional certification are not necessarily indicators of shortage in the commonwealth.

Some of the indicators included in federal teacher shortage calculations are not necessarily valid indicators of shortage in Kentucky. As explained later in this chapter, many Kentucky teachers are attaining certification through means that could be considered irregular or that require teachers to work initially with temporary, provisional certification. Most of these teachers are considered fully qualified for hiring purposes within the state and their type of certification is thus not necessarily an indicator that fully certified teachers are not available or willing to teach.

There is no disadvantage to the state in the discrepancy between indicators included in federal calculations and those that indicate shortage in the commonwealth. However, shortages as reported to the federal government should not necessarily guide state programs.

There is no disadvantage to the state in including teachers with irregular or temporary, provisional certificates in calculations of shortage for federal reporting purposes as the federal government uses shortage areas to determine eligibility for some scholarship

¹As stated in 34 CFR 682.210(q)(6). Federal calculations also include out-of-field teachers. Out-of-field teachers in Kentucky would require emergency certificates unless these teachers were in the process of becoming certified in additional content area. In those cases, teachers would hold probationary or alternative certificates.

and loan programs. However, shortage areas as reported to the federal government should not necessarily be used to guide programmatic decisions within the commonwealth.

States are permitted to propose alternative measures for calculating teacher shortages. Kentucky does not have an alternative method though several state statutes give the Commissioner of Education authority to determine teacher shortage areas for specific purposes.

States are permitted to propose alternative measures for calculating teacher shortages. For example, states can identify particular regions or grade levels that meet the federal definition of shortage. Some states collect additional data such as annual surveys of superintendents to determine areas of greatest perceived need. Virginia collects data on the number of applicants per position, with positions that have three or fewer applicants considered shortage areas. There are no Kentucky statutes setting out formulas for calculating teacher shortage, though several give the Commissioner of Education authority to determine teacher shortages for specific purposes.²

Teaching Certificates

The Education Professional Standards Board is responsible for issuing certificates appropriate to particular grades, content areas, and student populations.

The Education Professional Standards Board is responsible for issuing certificates appropriate to particular grades, content areas, and student populations. Teachers who have all required credentials are issued full professional certificates. While most Kentucky teachers become certified through traditional preservice preparation programs, many become certified through alternative routes. Once certified, Kentucky teachers can earn additional certifications through a variety of means.

Initial Certification

Teachers have traditionally earned initial certification by completing 4-year teacher preparation programs that include coursework relevant to the subject of certification and supervised practice teaching experiences. Teachers must also pass required licensure exams and successfully complete Kentucky's Teacher Internship Program.

Preservice Preparation Programs. Teachers have traditionally earned initial certification by completing 4-year teacher preparation programs that include coursework relevant to the subject of certification and supervised practice teaching experiences. Candidates for full professional certification must also pass required licensure exams and successfully complete Kentucky's Teacher Internship Program (KTIP). Most candidates in traditional programs fulfill all certification requirements except KTIP prior to beginning work as a teacher.

² KRS 156.106 and KRS 164.769 give the Commissioner of Education authority to determine teacher shortages for purposes of allowing districts to hire retired teachers and to determine shortage areas that apply to Kentucky's teacher scholarships.

The General Assembly has authorized eight alternative pathways to certification. Through these pathways, teachers can begin teaching without having met all of the requirements of traditional preparation programs. Prior to attaining full certification, however, teachers entering through alternative routes must fulfill many of the same requirements as traditionally certified teachers.

More than one-fifth of first-year teachers are in the process of becoming fully certified through alternative routes. Once teachers in alternative routes meet program requirements they are considered fully certified and are not distinguished in the data from teachers who have entered through preservice programs.

Teachers in the process of becoming certified through alternative routes can be hired regardless of whether or how many teachers with full professional certificates apply for a position. Thus, while they can be considered indicators of shortage by the federal government, alternatively certified teachers are not necessarily an indicator of shortage in the commonwealth.

Alternative Routes. Through KRS 161.048 the General Assembly authorized eight alternative routes by which candidates could achieve full professional certification without first completing a traditional preservice teacher preparation program. Each route accelerates the pace at which teachers can enter the profession by allowing them to begin teaching without having met all of the criteria that they will eventually need for full certification. Teachers can teach for up to 3 years while meeting requirements such as coursework, KTIP, and licensure exams. During this time teachers are issued temporary provisional certificates. Once teachers in alternative routes complete all program requirements, they are granted full professional certificates.³

Alternatively certified teachers now constitute a substantial source of newly certified teachers. Between 2008 and 2012 more than one-fifth of teachers in their first year of teaching were in the process of completing alternative routes. In 2011, for example, 489 of 2,194 first-year teachers had alternative certificates.⁴ Once alternatively certified teachers have met program requirements, passed required exams, and successfully completed Kentucky Teacher Internship Program, they receive full professional certificates and are not distinguished in the data from teachers who have entered through traditional routes.⁵

Alternatively certified teachers are issued temporary provisional certificates which can be considered indicators of shortage by the federal government. However, these certificates are not necessarily an indicator of shortage in the commonwealth. KRS 161.048 does not include relief of teacher shortages as a purpose in establishing alternative certification routes. A district can hire an alternatively certified teacher regardless of whether and how many traditionally certified applicants apply.

³ Temporary provisional certificates are granted to teachers in the process of achieving full professional certificates through alternative routes. Temporary provisional certificates are called alternative certificates in this report.

⁴ This figure does not include teachers who also held alternative certificates in 2010.

⁵ Percentage of all Kentucky teachers who have entered through alternative routes could be determined by linking alternative certificate data from the Educational Professional Standards Board with the Kentucky Department of Education's Professional Staff Data of teachers currently employed in the state. Option 4 (adjunct instructor) teachers cannot obtain full certification through that route. The Kentucky Teacher Internship Program provides assistance and support to first-year teachers. The Kentucky Teacher Internship Program is also a means of determining whether teachers have the classroom skills required to be issued full professional certificates (16 KAR 7:010).

Additional Certification

Once they achieve initial certification, Kentucky teachers can become certified in additional areas through a variety of means.

Once they achieve initial certification, Kentucky teachers can become certified in additional areas through a variety of means. Teachers can take additional coursework that gives them an endorsement to teach a particular subject. Teachers can also become certified in additional subjects through the TC-HQ route. This route provides a means by which additional teaching certificates can be granted to teachers if they meet federal requirements to be considered highly qualified. Teachers must pass EPSB-required exams and demonstrate relevant coursework, professional development, and experience in new content areas.

Emergency Certificates

Emergency certificates are a direct indicator of shortage in the commonwealth. Emergency certificates permit college graduates to fill vacant positions for up to 1 year. A district can fill a vacancy with an emergency certified teacher only when no qualified, certified applicant is available.

Emergency certificates are a direct indicator of teacher shortage in the commonwealth. When a district is unable to fill a vacant position with a qualified teacher, it can apply to the EPSB for an emergency certificate permitting a college graduate to fill the position for up to 1 year.⁶ Emergency certified teachers are not required to have particular content knowledge or teaching experience for the positions they are filling, though districts must look for both qualities when choosing from available applicants. Individuals possessing emergency certificates are often, but do not have to be, teachers certified in other subjects. If a district fills a vacant position with an emergency certified teacher, it must document reasons that any certified applicants are considered unqualified (16 KAR 2:120).

Teacher Shortage Trends 2001-2012

Trends in the number of emergency and alternative certificate issued in the last decade signal broad shifts in the supply of certified teachers in shortage areas.

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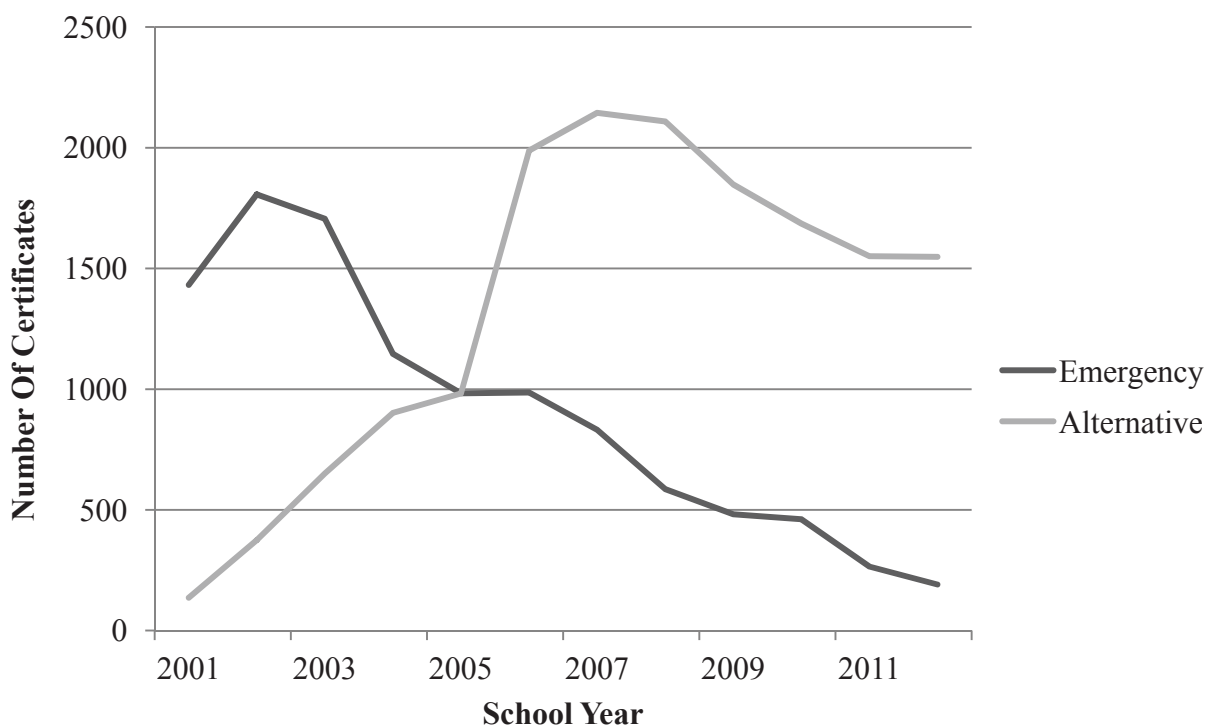
Figure 1.A shows data for the number of emergency and alternative certificates issued from 2001 to 2012. Alternative certificate data reflect only those teachers in the process of pursuing full professional certification through an alternative route. Certificate data and total teacher counts reported in this study are for Kentucky public school teachers only.

⁶ Prior to July 2011, the same individual could hold an emergency certificate for more than 1 year.

Between 2001 and 2012 the number of emergency certificates dropped from 1,432 to 191, a decrease of 87 percent. In this period, the number of alternative certificates jumped from 136 to 1,548, an increase of 91 percent.

Over time, the number of emergency certificates issued has decreased while the number of certificates issued to teachers pursuing certification through alternative routes has increased. Between 2001 and 2012, the number of emergency certificates dropped from 1,432 to 191, a decrease of 87 percent. During this same period, the number of alternative certificates jumped from 136 to 1,548, an increase of 91 percent.

Figure 1.A
Emergency And Alternative Certificates
2001-2012



Note: The data reported in this figure are for certificates, not individual teachers. In some cases an individual teacher can hold an emergency or alternative certificate in more than one content area in a single year. The data on alternative certificates in this figure include only those teachers in the process of completing alternative routes. Once these teachers have complete program requirements, including EPSB-required assessments and the Kentucky Teacher Internship Program, they receive full professional certificates and are no longer counted in alternative certificate data.

Source: Staff analysis of Education Professional Standards Board data.

In 2012, emergency certificates exceeded 1 percent of all teachers in the areas of chemistry and English as a second language only.

Between 2008 and 2012 emergency certificates persisted primarily in the areas of chemistry, English as a second language, exceptional children, secondary mathematics, preschool, and world languages. By 2012, however, emergency certificates were less than 0.5 percent of all teaching positions and exceeded 1 percent in

the areas of chemistry and English as a second language only.⁷ Appendix A shows emergency certificate data for all major content areas between 2008 and 2012.

National and regional data also suggest that teacher shortages have declined in the last decade. A 2010 survey of districts and colleges showed surpluses in the elementary grades and shortages in the areas of English as a second language, some world languages, exceptional children, math, and some sciences. The survey indicated no areas of considerable shortage (American).⁸ The same survey in 2002 indicated greater degrees of shortage in shortage areas and did not indicate surplus at the elementary level. Data collected by KDE also suggest an increase in the supply of teacher applicants and possible surpluses in some areas. The total number of applicants reported by districts to KDE doubled between 2010 and 2011 for approximately the same number of positions (Commonwealth. Department. *Division*).⁹

2012 Teacher Shortage Data

Shortage Indicators

Table 1.1 describes the Kentucky indicators that meet federal shortage criteria. Some of these criteria are more direct indicators of shortage in the commonwealth than others.

Table 1.1 describes the Kentucky indicators that meet federal shortage criteria. This report uses the term “shortage positions” to describe unfilled positions and positions filled by teachers meeting any of the shortage indicators described in the table. Of these shortage positions, those that are unfilled or that are filled by teachers with emergency certificates are most likely to signal shortage in the commonwealth. Most of the remaining indicators describe positions filled by teachers who have attained or are in the process of attaining certification through routes other than traditional preservice preparation programs. Positions filled by teachers in the process of completing alternative certification programs are the majority of these additional indicators.

⁷ Emergency certificates were about 1.5 percent of all teachers holding chemistry or English as a second language certificates.

⁸ These trends were similar in the national data as well as data collected for the Southeast region that includes Kentucky and in other regions neighboring Kentucky. Nationally, colleges reported physics as a considerable area of shortage but districts reported physics as some shortage.

⁹ The total number of applicants reported statewide increased from 292,000 in 2010 to 490,000 in 2011. These data suggest an increased applicant pool but are otherwise difficult to interpret because of differences among districts in the way the data are reported.

Table 1.1
Number Of Positions In Each Indicator Of Shortage
Under Federal Or Kentucky Law
2012

Indicator	Description	Number Of Positions
Direct Indicators		
Emergency Certificate	Certificate that allows an individual with a college degree to fill a position for a maximum of 1 year if a qualified teacher is not available	123
Unfilled Positions*	Positions not filled after the beginning of the academic year	114
Total Direct Indicators		237
Additional Indicators		
Alternative Certificate	Certificate issued to teachers pursuing one of eight alternative pathways to certification as authorized by the General Assembly	1,024
TC-HQ Certificate**	Additional certificate awarded to certified teachers who pass an EPSB-required exam and demonstrates relevant coursework, professional development, and experience in new content area	157
Probationary Certificate	Certificate permitting certified teachers to teach out of field if they are fulfilling coursework required to become certified for their position	151
Temporary Certificate	One-year certificate for teachers who have not yet taken EPSB-required assessments but are certified in other states	56
Conditional Certificate	One-year certificate for teachers who have completed preparation programs but failed at least one EPSB-required assessment	9
Limited Certificate	One-year certificate for foreign language teachers in exchange programs	19
Retired Teachers Rehired in Shortage Areas	Retired teachers hired to fill a shortage area position because qualified working teachers are not available	176
Total Additional Indicators		1,592
Total All Kentucky Teachers		43,381

* Data on unfilled positions were calculated based on positions posted on the Kentucky Educator Placement Services website at the beginning of the 2013 school year. Data included positions posted for at least 30 days as of September 21, 2012. Jefferson County districtwide positions are not included in the counts as most of these posted positions are for anticipated vacancies rather than unfilled positions. It is possible that some of the positions posted had been filled at that time, but districts had not removed the posting.

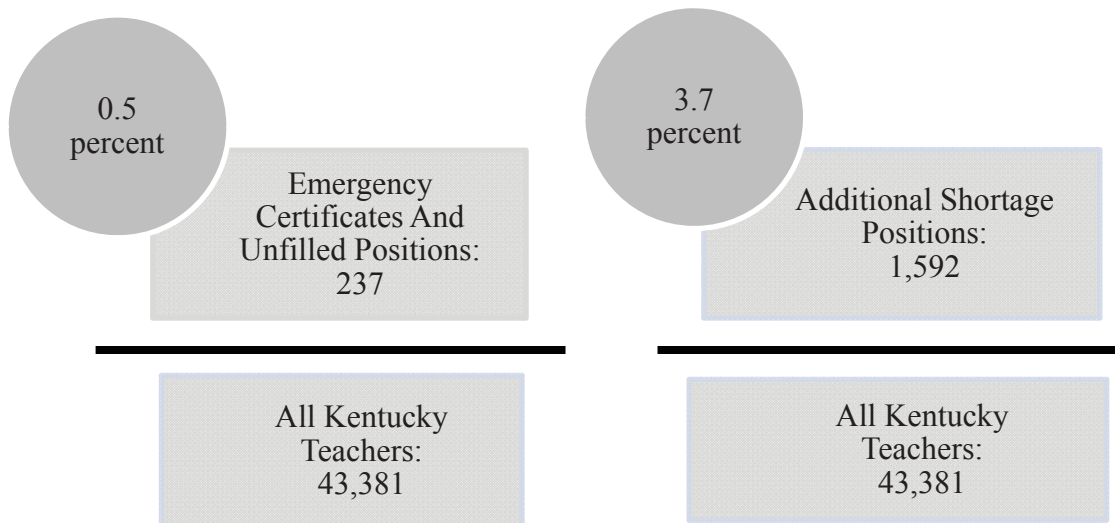
** TC-HQ More than two-thirds of these certificates have been granted in the middle school content areas of math, English, science, and social studies.

Source: Staff analysis of data from the Kentucky Department of Education and Education Professional Standards Board.

Determinations of teacher shortage vary based on the measures included in calculations. Teacher shortages as measured by the most direct indicators of emergency certificates and unfilled positions are small. Teacher shortages that include alternatively certified teachers are much greater.

Determinations of teacher shortage vary based on the measures included in calculations. Figure 1.B shows that teacher shortages as measured by the most direct indicators of emergency certificates and unfilled positions are only one-half of 1 percent of all teachers. Teacher shortage positions that include all indicators that meet federal criteria are an additional 3.7 percent of Kentucky teachers. The majority of these shortage positions are filled by alternatively certified teachers. These teachers do not necessarily indicate a shortage of certified teachers in the commonwealth.

Figure 1.B
Emergency Certificates And Unfilled Positions
And Additional Shortage Positions
As A Percent Of All Teachers
2012



Notes: Data on unfilled positions were calculated in September 2012. Not all of the shortage positions represent full-time positions, whereas the total number of Kentucky teachers represents full time equivalent positions. The data include shortage indicators in all subject areas, not just the areas that have been identified as shortage areas by the Kentucky Department of Education or described by the Office of Education Accountability in this report. In many cases, a shortage position is filled by a teacher holding more than one type of shortage indicator certificate.

Source: Staff analysis of Kentucky Department of Education and Education Professional Standards Board data.

Teacher Shortages By Content Area 2012

Total counts of teachers in each subject area are necessary to interpret shortage data by content area and to predict future demand. These counts are not currently available from a single source. Appendix B describes data collection issues and the method by which OEA estimated teacher counts for this report.

Data on shortage positions by content area are based on estimated position counts. These data are valid as indicators of broad differences in shortage among content areas but not for making close comparisons among content areas.

Table 1.2 shows positions that met shortage criteria by content area as a percentage of all estimated positions in that content area in 2012. The data presented in the table are valid as indicators of broad differences in shortages among content areas but not for making close comparisons. In some cases, the methods used to calculate positions in different content areas may have led to small over- or underestimates in the percentages of shortage positions.

Table 1.2 reports the direct shortage indicators of unfilled positions and emergency certificates in the first column of data. The second column reports percentages of positions filled by teachers who meet additional shortage criteria: retired teachers; teachers holding alternative, probationary, temporary, conditional, and limited certification; and teachers who attained certification through the TC-HQ option in 2012.

In 2012 small percentages of positions in any content area were unfilled or were filled by teachers holding emergency certificates. In many content areas, positions meeting other shortage criteria exceeded 5 percent of all estimated positions. These additional shortage data are driven largely by the number of teachers in the process of becoming certified through alternative routes.

The table shows small percentages of positions in each content area that were unfilled or were filled by teachers with emergency certificates in 2012. The only subjects in which these direct indicators exceeded 1 percent were chemistry and English as a second language. In many content areas, positions meeting other shortage criteria exceeded 5 percent of all estimated positions. These additional shortage data are driven largely by the number of teachers in the process of becoming certified through alternative routes. Content areas with the greatest percentage of positions meeting other criteria were English as a second language and exceptional children.

Table 1.2
Shortage Positions As A Percentage Of All Estimated Positions
By Content Area
2012

Content Area	Positions Unfilled Or Filled By Teachers With Emergency Certificates	Positions Meeting Other Shortage Criteria
	Secondary	
Biology	0.4%	7.5%
Chemistry	1.6	5.5
Earth science	0.9	0.5
English	0.5	4.4
Math	0.9	7.8
Physics	0.5	3.6
Social studies	0.3	3.0
Middle		
English	0.7	5.0
Math	0.5	8.3
Science	0.9	7.3
Social studies	0.1	6.8
Elementary And Preschool		
Elementary P-5	0.1	0.4
Early childhood (preschool)	0.9	2.4
All Grades		
English as a second language	1.5	12.9
Exceptional children	0.7	9.0
World languages	0.9	6.4

Note: Unfilled positions as of September 2012 were used. The table does not include data on teachers in technical or vocational education positions, as complete data for these teachers were not available. The table also excludes content areas such as art, music, and physical education that had relatively low numbers of shortage indicators in 2012.

Source: Staff analysis of data from the Education Professional Standards Board and the Kentucky Department of Education.

Five percent or more of teachers in many content areas are working with certificates other than those attained by graduating from preservice preparation programs. Some of these teachers may not have yet demonstrated content or pedagogical knowledge relevant to the position they are filling.

These percentages indicate that more than 5 percent of teachers in many content areas are working with alternative or other certificates indicating they are in the process of becoming or have just become certified through routes other than 4-year university programs completed prior to service. As discussed later in this chapter, many of the teachers with alternative certificates may be entering teaching with limited preparation in teaching methods, and some of these teachers may not have demonstrated content knowledge in their area of certification. Thus, while high

percentages of shortage indicator teachers do not necessarily signal shortage of certified teachers, they may indicate a need for attention to early career mentoring in some subject areas.

With the exception of elementary and preschool, the Kentucky Department of Education identified all content areas shown in Table 1.2 as shortage areas for the 2013 school year. The federal government does not require states to indicate areas of greatest need, and the Kentucky Department of Education has not done so in the past.

Shortage data collected in 2012 may not reflect shortages likely to occur in the future. Also, shortage data as calculated in this report rely entirely on teacher certification as an indicator of adequate supply. These data do not reveal differences among types of schools or regions in the supply of teachers that meet local expectations or other indicators of quality.

With the exception of elementary and preschool, the Kentucky Department of Education identified all content areas shown in Table 1.2 as shortage areas for the 2013 school year. In addition, the department identified the career and technical education areas of engineering and information technology and health sciences as shortage areas. The federal government uses these shortage designations to identify teachers who might be eligible for loan forgiveness or deferment under four federal programs.¹⁰ The federal government does not require states to indicate in which areas need is greatest, and KDE has not done so in the past.

Limitations. Shortage data collected in 2012 may not reflect shortages likely to occur in the future. Chapter 2 presents data suggesting shortages in subjects such as chemistry and physics are likely to be greater in the future than they are now. Also, the shortage data reported in Table 1.2 rely entirely on teacher certification as an indicator of adequate supply and do not reveal differences among types of schools or regions in the supply of teachers considered to be high quality. The Office of Education Accountability has previously reported difficulties of rural high schools in attracting and retaining math teachers who meet administrators' expectations for quality. These difficulties cannot be ascertained through teachers' certification status alone. Finally, shortage data are based on positions created at the school level. Shortage indicators in areas such as world languages or physics might be greater if schools elected to create more positions in these content areas.

¹⁰ Federal Family Education Loan/Federal Stafford Program, Federal Perkins Loan, Teacher Education Assistance for College and Higher Education Grant, and the Paul Douglas Teacher Scholarship Program.

Shortage Positions By Region And School Type 2008-2012

The Office of Education Accountability analyzed shortage position data for 1,129 schools for which complete data were available in all years 2008 through 2012.¹¹ This analysis combines direct and other indicators of shortage, as described earlier in this chapter, into a single shortage measure.

Shortage positions rarely exceed 10 percent of all teaching positions in a school and are not concentrated in any one region of the state, though they are slightly higher in some regions than others.

Shortage positions rarely exceed 10 percent of all teaching positions in a school and are not concentrated in any one region of the state, though they are slightly higher in some regions than others. Appendix C lists shortage positions by district and region between 2008 and 2012. Districts with the highest percentage of shortage positions are independent or small districts. Because of the small number of teachers in these districts, several shortage area teachers can have a large impact on overall percentages. Also, because teachers in these districts often need to serve more than one function, they may be more likely to pursue alternative, TC-HQ, or probationary certificates that allow them to be certified in multiple areas.

Annual average data for 2008 through 2012 indicate that shortage positions exceeded 10 percent of all positions in 105 schools and 15 percent of all positions in 21 schools.

Annual average data for 2008 through 2012 indicate that shortage positions exceeded 10 percent of all positions in 105 schools and 15 percent of all positions in 21 schools. Shortage positions exceeded 20 percent in a handful of schools, including one small high school in which nearly 30 percent of all positions were shortage positions.

Middle and high schools have greater percentages of shortage positions than do elementary schools.

Middle and high schools have greater percentages of shortage positions than do elementary schools. In 2008 through 2012, 7 percent of high school positions, 6 percent of middle school positions, and 2 percent of elementary school positions were shortage positions.

¹¹ This analysis includes only A1 schools—those that are not operated by or as part of another school. The analysis does not include any schools for which data were not available in any of the years 2008 through 2012. Staff used the Educational Professional Standards Board certificate data on shortage indicator certificates to identify the number of teachers working with these certificates at each school in the commonwealth. To analyze differences among schools, staff used Professional Staff Data to calculate the percentages of all teachers at each school location holding shortage indicator certificates. Unfilled position data was not available at the school location level and was not included in this analysis.

Data analyzed for this study did not indicate substantial differences overall among schools with different demographic characteristics in the percentages of all teaching positions that were shortage positions. However, middle and high schools in which greater than 10 percent of positions were filled by teachers meeting shortage indicators served a higher percentage of students living in poverty than did schools with less than 10 percent.

Data analyzed for this study did not indicate substantial differences overall among schools with different demographic characteristics in the percentages of all teaching positions that were shortage positions in 2008 through 2012. This was true for both the total shortage measures and for emergency certificates. However, student demographics in middle and high schools in which greater than 10 percent of positions were filled by teachers meeting shortage indicators differed from middle schools with less than 10 percent of positions held by these teachers. The average percentage of students living in poverty in middle schools in which shortage positions exceeded 10 percent was 64 percent compared to 52 percent in other middle schools. The average percentage of students living in poverty in high schools in which shortage positions exceeded 10 percent was 57 percent compared to 49 percent in other high schools. Higher shortage middle schools served student populations that were, on average, 26 percent minority versus 13 percent in lower shortage middle schools.

Alternative Routes To Certification

Of Kentucky's eight alternative certification options, the most common (option 6) allows an individual with an offer of employment to begin teaching immediately as long as he or she is enrolled in a postbaccalaureate program approved by the Education Professional Standards Board (EPSB) in the area of certification appropriate for the position.

Table 1.3 shows the number of certificates granted between 2008 and 2012 to teachers in the process of pursuing certification through the eight alternative routes authorized by KRS 161.048. The program requirements for each option are described in detail in the legislation (Appendix D). Of Kentucky's eight alternative certification options, option 6 is the most common. Option 6 allows an individual with an offer of employment to begin teaching immediately as long as he or she is enrolled in an Education Professional Standards Board-approved postbaccalaureate program in the area of certification appropriate for the position. The overwhelming majority (86 percent) of teachers with alternative certificates in 2008 through 2012 were working through option 6.

Table 1.3
Alternative Certificates Granted
For Options 1-8 As Authorized By KRS 161.048
2008-2012

Option	Title	Number Of Certificates
6	University Based	4,751
3	College Faculty	220
4	Adjunct Instructor	186
5	Veterans of the Armed Forces	142
2	Local District Training	103
1	Exceptional Work Experience	101
7	University Institute	22
8	Teach for America	21
Total Alternative Certificates		5,546

Note: Individuals pursuing particular alternative certificates are counted only once even if they possess the certificate for more than 1 year. In some cases, a single individual earns more than one type of alternative certificate. These individuals are counted for each certificate.

Source: Staff analysis of Education Professional Standards Board data.

Alternative Certification By Content Area

Alternative certification is more common in some content areas than others.

Percentages of total program completers who were in alternative certification programs between 2008 and 2012 were much higher in some content areas than others. Candidates in alternative programs were one-third or more of completers in programs leading to certification for exceptional children, world languages, and secondary science. About one-fifth of middle and high school math program completers were in alternative certification programs. Only 1 percent of elementary program completers came through alternative route programs.

Requirements Of Alternative Certification Programs

The alternative options offered in Kentucky differ in what they require teachers to know about content and pedagogy before they begin teaching. Only Teach for America requires a candidate to have some training in teaching techniques prior to beginning work as a teacher.

The alternative options offered in Kentucky differ in what they require teachers to know about content and pedagogy before they begin teaching. Most options require candidates to demonstrate knowledge in the content area of alternative certification before they begin teaching. Only Teach for America requires a candidate to have had some training in teaching techniques prior to beginning work as a teacher.¹² All eight options require candidates to pass the

¹² Teach for America is a national program that recruits candidates with exceptional academic credentials to teach in hard-to-staff schools.

EPSB-required content assessments and to successfully complete the Kentucky's Teacher Internship Program before being issued full professional certificates.

Unlike most of the other options, option 6 does not require a teacher to demonstrate content knowledge in a particular area of certification prior to teaching. Option 6 admissions requirements were not analyzed for this study. Many individual option 6 programs do require applicants to demonstrate content knowledge in the certification area being pursued. This requirement is less likely in option 6 programs for exceptional children.

Because most teachers pursuing alternative certification do so through option 6, the specific requirements of this option should be noted. Unlike most of the other options, option 6 does not require a teacher to demonstrate content knowledge in a particular area of certification prior to teaching. Option 6 admissions requirements were not analyzed for this study. According to EPSB, many individual option 6 programs do require applicants to demonstrate content knowledge in the certification area being pursued prior to program admission. Alternative certification programs for teachers of exceptional children are less likely to require that candidates demonstrate specific knowledge of exceptional children prior to program admission (Carr). Option 6 candidates are not required to have any pedagogical training prior to employment and are not required to begin coursework until 90 days after they are declared eligible for employment.

Option 6 programs are required to support candidates as they enter teaching. The Educational Professional Standards Board is in the process of reviewing the requirements of option 6 university programs for monitoring and supporting candidates.

Option 6 programs are required to support candidates as they enter teaching by establishing, in cooperation with the employing school, a plan for mentoring in the work setting; by ensuring that candidates are observed a minimum of 15 hours prior to participation in KTIP; and by maintaining sufficient personnel and resources to support candidates in their transition to teaching (16 KAR 9:080). EPSB is in the process of reviewing the requirements of option 6 university programs for monitoring and supporting candidates.

Teach Kentucky

Teach Kentucky, a nonprofit group based in Louisville, provides supplemental support and incentives to option 6 candidates with strong academic credentials.

Teach Kentucky, a nonprofit group based in Louisville, provides supplemental support and incentives to option 6 candidates. The group conducts national searches for candidates with strong academic credentials and provides \$3,000 scholarships for those who score in the top quartile of PRAXIS II content exams in science, technology, engineering, and mathematics. The group looks for candidates who are willing to teach in high-poverty schools and consider a long-term teaching career in Kentucky. Teach Kentucky candidates enter teaching through option 6 but are provided additional training and support that include summer institutes and civic mentoring. To date 105 recruits have completed or are pursuing option 6 certification and 71 are teaching in Kentucky public schools (Teach Kentucky).

Research On Alternative Routes To Certification

Kentucky data shows increasing numbers of alternatively certified teachers mirror national trends. Forty-seven states and the District of Columbia have some form of alternative certification. The nature and quality of alternative certificate programs vary.

Forty-seven states and the District of Columbia have some form of alternative certification. In New Jersey, California, and Texas, about one-third of teachers enter through alternative certificates (Wilson). The nature and quality of alternative certificate programs vary. Some programs provide full-year internships, and others place new teachers in classrooms with very little formal training. Thus, research conducted on effectiveness of some alternative certification programs cannot be generalized to all programs. From a review of seven alternative programs, one study concluded that, “too often, programs allow market forces to determine the placements of their participants, and teachers find themselves working in conditions that are not conducive to their learning or the academic achievement of their students.” (Humphrey 523). The authors suggested that many programs could be improved by doing more to monitor and support candidates in their school settings and to ensure that candidates are placed in appropriate school settings.

To date, research has not consistently documented significant differences in the effectiveness of alternatively versus traditionally certified new teachers. There is little research on the effects of alternative certification on exceptional children.

To date, research has not consistently documented significant differences in the effectiveness of alternatively versus traditionally certified new teachers. However, much of the research documenting teacher effects on student outcomes is based on standardized tests in reading and math in grades 3 through 8. Very little research has been conducted on alternative teachers in untested grades and subjects. In particular, there is little research on the effects of alternative certification on exceptional children. Many of these children have educational goals beyond those that can be measured directly through standardized tests. The lack of research in this area is notable given the large numbers of Kentucky exceptional child teachers with alternative certificates.

The Education Professional Standards Board does not currently publish teacher survey or other data on the quality and effects of alternative certification programs. A 2007 survey of almost 600 alternatively certified teachers suggests that most teachers are satisfied with the coursework and the level of mentoring and support they receive through alternative programs.

The EPSB does not currently publish teacher survey or other data on the quality and effects of alternative certification programs versus traditional programs. A 2007 survey of almost 600 alternatively certified teachers suggests that most teachers are satisfied with the coursework and the level of mentoring and support they receive through alternative programs. Between 70 percent and 80 percent of responding teachers reported that they were satisfied or very satisfied on questions related to quality of coursework and accessibility, and helpfulness of district mentors and university advisors. However, survey responses raise concerns about inadequate support of some teachers. Between 10 percent and 12 percent of respondents reported that they were dissatisfied or very dissatisfied with accessibility and support of university advisers or district mentors. Sixty percent of respondents indicated

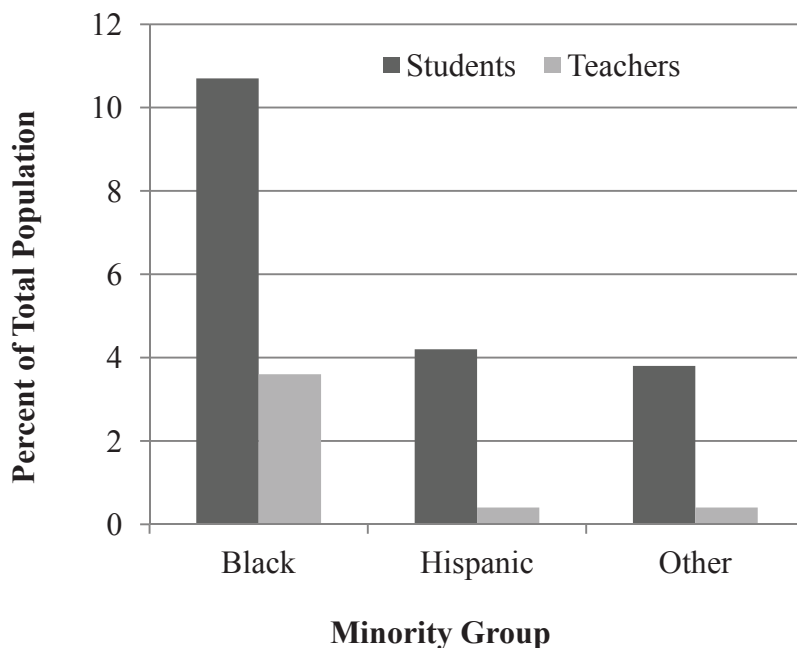
that they were observed by a university adviser or mentor for 6 or fewer hours over the course of the school year (Commonwealth Education. Survey 3).

Minority Teachers

Statewide, the percentage of students who are minorities (18.7) is more than four times greater than the percentage of teachers who are minorities (4.4).

Statewide, the percentage of students who are minorities (18.7) is more than four times greater than the percentage of teachers who are minorities (4.4). Figure 1.C shows discrepancies between student and teacher populations in specific minority groups. Black students make up 10.7 percent of the student population whereas only 3.6 percent of teachers are black.¹³ Hispanic students and students from other minority groups were 4.2 and 3.8 percent of the student population, respectively, yet less than one-half of 1 percent of teachers is from these groups. While minority teachers are underrepresented in every group, discrepancies between student and teachers populations are especially great for Hispanic and other minority students.

Figure 1.C
Black, Hispanic, And Other Minority Students And Teachers
As A Percentage Of All Students And Teachers
2012



Source: Staff analysis of data from the Kentucky Department of Education.

¹³ Slightly higher percentages of administrators (4.3) are black.

The ratio of minority teachers to minority students has not changed in the last decade.

The ratio of minority teachers to minority students has not changed in the last decade. The discrepancy between 2012 student and staff demographics reported in Figure 1.C is virtually identical to those in 2002 and 2005.

Districts vary in the percentages of teaching staff who are minorities. In 2012, 63 districts had few or no minority teachers. In only three districts did the percentage of minority teachers exceed 10 percent.

Districts vary in the percentages of teaching staff who are minorities. As shown in Table 1.4, 63 districts had few or no minority teachers in 2012.¹⁴ Among these 63 districts the average percent of all students who were minority students was 4.9. On average, districts with greater percentages of minority students also have greater percentages of minority teachers. In only three districts did the percentage of minority teachers exceed 10 percent. At 16 percent, Jefferson County has the largest percentage, and also the greatest number of minority teachers in the state. Still, the percentage of Jefferson County teachers who are minority is one-third the percentage of students who are minority. Minority hiring reports submitted by Jefferson County each year to KDE indicate aggressive efforts to train and recruit minority applicants. These include a district training program that targets minority applicants and a focus in Future Educator of America groups on identifying minority students with an interest in teaching.

Table 1.4
Percentage Of Teachers Who Are Minorities
By District
2012

Percent Of Teachers Minority	Number Of Districts	Average Percent Of Minority Students
0%	63%	5%
1-3	81	9
4-6	17	24
7-10	10	33
>10	3	51

Source: Staff analysis of data from the Kentucky Department of Education.

The percentage of candidates completing teacher preparation programs in Kentucky is not proportional to the percentage of Kentucky students who are minorities.

The percentage of candidates completing teacher preparation programs in Kentucky is not proportional to the percentage of Kentucky students who are minorities. Between 2007 and 2009, 5.4 percent of candidates completing Kentucky postsecondary

¹⁴ Some of the districts in which 0 percent of teachers are minorities do employ some minority teachers. In these districts, minority teachers are less than 0.5 percent of all teachers so the total percentage is rounded to 0.

programs reported that they were minorities compared to 18.7 percent of primary and secondary students in Kentucky.¹⁵

Through KRS 161.165 the General Assembly has directed the Kentucky Department of Education to review and revise a strategic plan for increasing the number of minority teachers and administrators in the commonwealth.

Through KRS 161.165 the General Assembly has directed the Kentucky Department of Education in cooperation with the Educational Professional Standards Board, the Kentucky Board of Education, and a variety of other educational entities to review and revise a strategic plan for increasing the number of minority teachers and administrators in the commonwealth. KDE's strategic plan has included minority educator scholarships described in Chapter 2, a minority superintendents training program, and the annual collection of minority hiring data from school districts.

The Kentucky Department of Education collects annual data from districts on minority applicants who are interviewed and hired in Kentucky school districts and requires districts to submit minority recruitment and retention plans.

KDE's Diversification and Equity Branch within the Next Generation Professionals Branch collects annual data from districts on minority applicants who are interviewed and hired in Kentucky school districts.¹⁶ Districts are also required to submit plans documenting their efforts to attract and retain minority educators. Data collected by KDE in 2011 showed that 6 percent of the 4,916 teachers hired by districts were black, Hispanic, or other minority.

The data on minority applicants and hires that must be submitted by districts to the Kentucky Department of Education each year are labor intensive and may not offer more evidence of minority hiring patterns than can be determined from existing staffing data.

The data on minority applicants and hires that must be submitted by districts to KDE each year are labor intensive and may not offer more evidence of minority hiring patterns than can be determined from existing staffing data. Analysis of professional staff data can show overall percentages of teachers in every district who are minorities and can also indicate from year to year the numbers and percentages of new hires who are minorities. PSD cannot determine a district's opportunity to hire minority candidates, however. Districts that hire few minority candidates may also have few minority applicants. Minority Educator Recruitment and Retention data could be useful if it sheds light on differences among districts in the percentages of minority applicants who are interviewed and hired. Districts cannot require applicants to report race, however, so data on percentages of minority applicants interviewed and hired could not be reliably compared among districts. For this reason, KDE does not require districts to report the total number of minority applicants.

¹⁵ Actual percentages of minorities are unknown as 4.2 percent of program completers do not report their race.

¹⁶ For reasons discussed in this report, the Kentucky Department of Education no longer requires districts to submit data on the total number of minority applicants.

Recommendation 1.1

Recommendation 1.1

The Kentucky Department of Education should consider modifying requirements for the Minority Educator Recruitment and Retention data that districts submit annually. The department could generate district minority staffing profiles from data already submitted by districts through Professional Staff Data. Districts could continue to submit plans documenting efforts to recruit and retain minority teachers.

Measures Of Effective Teaching

The decrease in percentage of teachers lacking appropriate credentials should, in theory, signal improvements in teacher effectiveness in the commonwealth.

In the last decade, the number and percentage of teaching positions filled by teachers lacking appropriate certification for the position they are filling has dropped substantially. Since appropriately certified teachers are assumed to be more effective than those without appropriate certification, this trend should signal improvements in teacher effectiveness in the commonwealth.

The relationship between teacher certification and teacher effectiveness is not yet fully understood. Critics of existing preparation programs highlight loose relationships between certification and quality.

The relationship between teacher certification and teacher effectiveness is not yet fully understood. Many studies have noted substantial differences in effectiveness of certified teachers (Rivkin). Critics of existing preparation programs highlight loose relationships between certification and quality. Some have argued for improvements in the quality of preservice education (Levine; Darling-Hammond). Others argue that the United States should learn from higher-performing nations by doing more to attract top-quality graduates into the teaching profession (Auguste). Still others suggest that policy should focus more on hiring, firing, and mentoring than on attempting to affect teacher quality by controlling characteristics of the applicant pool (Rivkin).

Teacher shortage indicators that have been used in the past and those that are reported in this study focus on certification as a basic indicator of quality. Teacher shortage data do little to identify prevalence and distribution of effective teachers in the commonwealth.

Teacher shortage indicators that have been used in the past and those that are reported in this study focus on certification as a basic indicator of quality. However, teacher shortage data do little to identify prevalence and distribution of effective teachers in the commonwealth. Studies on the distribution of teachers considered to be effective based on one indicator—student growth on standardized tests— have been conducted in states like Tennessee and North Carolina. Research on the distribution of effective teachers in the commonwealth has been limited to date.

This chapter presents data on two Kentucky indicators that provide some measure of prevalence and distribution of teachers believed to be more and less effective.

This chapter presents data on two Kentucky indicators that provide some measure of prevalence and distribution of teachers believed to be more and less effective. Teachers certified through the National Board for Professional Teaching Standards (NBPTS) have been shown, on average, to be more effective than other teachers. Teachers with less than 3 years of experience have been shown, on average, to be less effective than other teachers. Effects of both indicators are relatively small.

Teachers who score in the lower performance ranges on teacher licensure exams are, on average, less effective than teachers who score in the higher performance ranges. There is already some evidence in Kentucky that teachers with low licensure scores are disproportionately likely to teach in some regions versus others. Distribution of teachers in the commonwealth by licensure exam score might be important to track in the future.

Research also suggests that teachers who score in the lower performance ranges on teacher licensure exams are, on average, less effective than teachers who score in the higher performance ranges (Goldhaber). Research conducted in Kentucky has shown that candidates scoring in the lower performance ranges are disproportionately likely to teach in Appalachian schools (Toma). OEA was not able to obtain the licensure data necessary to examine distribution of higher- and lower-scoring teachers among schools with different characteristics. However, licensure test data might be important to track in the future given the relatively large number of candidates becoming certified through alternative routes and the TC-HQ certification, both of which rely heavily on licensure scores as an indicator of content knowledge.

National Board For Professional Teaching Standards

The General Assembly established financial incentives for teachers who demonstrate higher-level teaching skills as indicated by certification from the National Board for Professional Teaching Standards (NBPTS).

The General Assembly established financial incentives for teachers who demonstrate higher-level teaching skills as indicated by certification from the NBPTS. The NBPTS is a nonprofit, nonpartisan, independent organization that recognizes accomplished teaching in 25 subject areas. As required by KRS 157.395, Kentucky teachers who have received NBPTS certification receive an annual salary supplement of \$2,000.

Appendix E shows differences between the funds that have been appropriated to pay salary supplements for NBPTS teachers and the funds necessary to fully reimburse districts for the cost of these salary supplements in recent years.

The General Assembly has established as a goal that every school in the commonwealth employ an NBPTS-certified teacher by 2020. In 2012 nearly two-thirds of Kentucky schools employed an NBPTS-certified teacher at least part time.

Research on NBPTS-certified teachers indicates that these teachers are, on average, more effective than non-NBPTS-certified teachers. NBPTS teachers are more likely to work in lower- than higher-poverty schools (Clotfelter. *How and High-Poverty*). In 2012, there were 2,137 NBPTS teachers working in Kentucky schools. Of those, 143 worked in districtwide or central office positions. The General Assembly has established as a goal that every school in the commonwealth employ an NBPTS-certified teacher by 2020

(KRS 161.131). Table 1.5 shows that nearly two-thirds of Kentucky schools employed an NBPTS-certified teacher in 2012 at least part time.

NBPTS teachers are not distributed evenly among schools in the state. Teachers with NBPTS certification exceeded 20 percent in 37 schools, whereas 456 schools did not employ any NBPTS-certified teachers. Differences between the average student poverty rate in schools employing no NBPTS-certified teachers (66) and those employing more than 20 percent NBPTS-certified teachers (42) were substantial. Table 1.5 shows that student poverty rates decline as the percentage of NBPTS-certified teachers increase. Thus, disproportionate numbers of NBPTS teachers are working in lower-poverty schools. There is much weaker relationship between percentage of NBPTS-certified teachers and percentage of minority students in a school.

Table 1.5
Percentage Of Teachers Certified By The
National Board For Professional Teaching Standards
By School Demographic Characteristics
2012

Schools By Percent of All Teachers NBPTS	Number Of Schools	Average Percent Students In Poverty	Average Percent Minority Students ^{Note:}
0	456	66%	14%
>0 to 4	264	57	18
5 to 9	267	54	17
10 to 19	165	51	13
20 or more	37	42	12
All schools	1,189	59	15

Notes: NBPTS is the National Board for Professional Teaching Standards. This analysis does not include the 25 teachers who worked in non-A1 schools.

Source: Staff analysis of data from the Kentucky Department of Education and Education Professional Standards Board

Teachers With Less Than 3 Years Of Experience

Teachers with less than 3 years of experience are, on average, less likely to produce gains in student achievement than are teachers with more experience.

Teachers with less than 3 years of experience are, on average, less likely to produce gains in student achievement than are teachers with more experience. Research has shown higher percentages of these less-experienced teachers in schools serving poor and minority children (Clotfelter. *High-Poverty*; Goldhaber).

Kentucky schools with high percentages of inexperienced teachers are more likely to serve poor and minority students than are other schools with more-experienced teachers.

Table 1.6 shows that Kentucky schools with high percentages of inexperienced teachers are more likely to serve poor and minority students, than are schools with more-experienced teachers. The table divides the state's schools into four quartiles based on the percentage of teachers with less than 3 years of experience. Schools in the top 25 percent when ranked by percentage of teachers with less than 3 years of experience serve, on average, student populations that are 7 percentage points higher in poverty, and 14 percentage points higher in minority students than do schools in the lowest quartile of inexperienced teachers. On average, 26 percent of teachers in highest inexperience quartile schools have less than 3 years of experience, compared to only 7 percent in low-inexperience quartile schools.

Table 1.6
Percentage Of Students In Poverty And From Minority Groups
By Quartile Of Schools Ranked By Percentages
Of Teachers With Less Than 3 Years Of Experience
2008-2012

Average Of All Schools In Quartile			
Quartile Of Schools From Greatest To Least Percentage Of Teachers With Less Than 3 Years of Experience	Teachers With Less Than 3 Years Of Experience	Student Poverty	Minority Students
(High) 1	26%	63%	24%
2	17	59	15
3	12	56	11
(Low) 4	7	56	10

Source: Staff analysis of data from the Kentucky Department of Education.

Chapter 2

Demand For And Supply Of Teachers To Fill Annual Vacancies

This chapter describes factors that influence the demand for and supply of teachers to fill annual vacancies and indicates several areas of concern. The supply of new, first-year teachers in some content areas may not be sufficient to meet future demand. Some schools face a competitive disadvantage in attracting and retaining teachers.

Kentucky has two teacher scholarship programs that might be targeted more directly at students likely to enter teaching in shortage fields or at teachers willing to teach in hard-to-staff schools.

Teachers who move schools or leave teaching are the primary factors driving the annual demand for teachers to fill vacant positions.

Between 2008 and 2012, 85 percent of teachers stayed in their schools the next year. The remainder either moved schools or did not teach in Kentucky public schools the next year.

The 7 percent of teachers who moved schools comprised 5 percent who moved within the same district and 2 percent who moved to another district.

This chapter analyzes data on teacher employment patterns and teacher preparation program completers in order to project future demand for and supply of teachers to fill annual vacancies. Data indicate several areas of concern. It appears that a disproportionate number of candidates are completing teacher preparation programs in some areas versus others. Also, teachers prefer to work in schools with certain geographic and demographic characteristics and in schools in which they perceive positive working conditions. This leaves other schools with a competitive disadvantage in attracting and retaining teachers.

Kentucky has two teacher scholarship programs that might be targeted more directly at students likely to enter teaching in shortage fields or at teachers willing to teach in hard to staff schools. A broad range of applicants are currently eligible to receive these scholarships.

Teacher Employment Patterns

Teachers who move schools or leave teaching are the primary factors driving the annual demand for teachers to fill vacant positions. Broader economic factors might cause teacher employment patterns to change in the future. However, teacher employment patterns have been consistent in the Commonwealth for at least the last 5 years and are thus useful for projecting future demand.

Figure 2.A shows the average annual percentages of teachers who vacated teaching positions between 2008 and 2012. During these years, 85 percent of teachers stayed teaching in their schools from one year to the next with the remainder either moving schools or not teaching in Kentucky public schools the subsequent year.

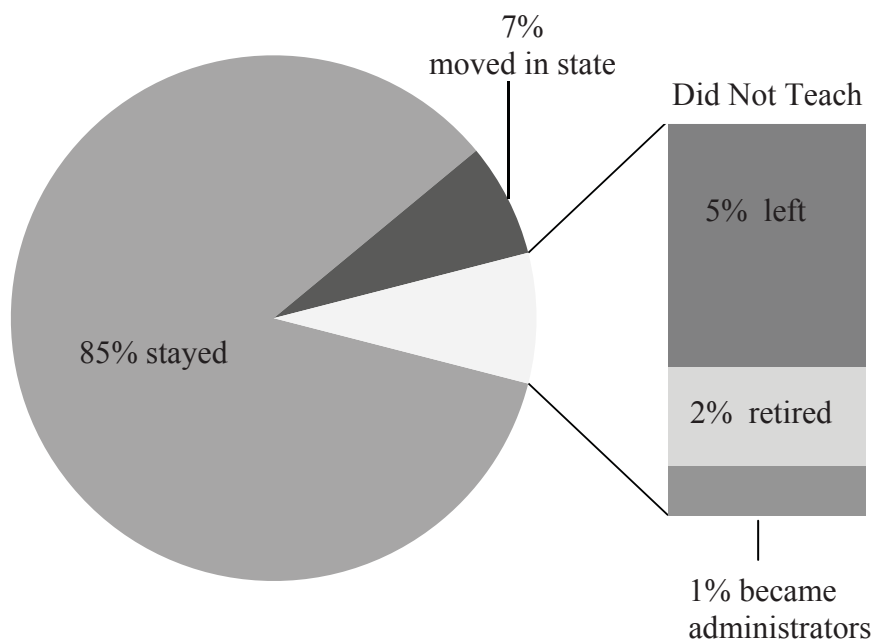
The 7 percent of teachers who moved schools within the state comprised 5 percent who moved to schools in the same district (2,346 in 2011) and 2 percent who moved to schools in other districts in the state (925 in 2011). As described later in this chapter, the percentage of teachers who moved schools was higher

in some schools and regions than in others. Teachers who move schools within the Commonwealth create vacancies at the school level but do not affect the state-level demand for teachers; teachers who move create an equal amount of demand at the end of one year and supply at the beginning of the next.

The 8 percent of teachers who did not teach the following year comprised 5 percent who were no longer working in Kentucky public schools but not eligible to retire, 2 percent who retired, and 1 percent who became administrators.

The state-level demand for teachers to fill vacancies is created primarily by the 8 percent of teachers annually who do not teach in Kentucky public schools the subsequent year. Of those who do not teach from one year to the next, more than twice as many leave working in Kentucky public schools as retire. Between 2008 and 2012, 5 percent of teachers did not work in Kentucky public schools the subsequent year (2,401 in 2011), 2 percent retired (912 in 2011), and 1 percent took administrative positions (445 in 2011).

Figure 2.A
Average Annual Percentage Of Teachers Who
Moved Schools Or Did Not Teach Subsequent Year
2008-2012



Note: Teachers with 26 or more years of teaching experience who leave teaching are assumed to have retired. Teachers counted in “left” are those with less than 26 years of teaching experience who are not working in any capacity in Kentucky public schools the subsequent year.

Source: Staff analysis of Kentucky Department of Education Professional Staff Data.

Teacher employment patterns in Kentucky mirror national data.

Data on employment patterns of Kentucky teachers mirror national data. In 2008, 84.5 percent of teachers in a national sample stayed in their same schools, 7.6 percent moved, and 8 percent left teaching (Keigher 3).

Understanding Teacher Employment Patterns

Attrition Of Teachers From Schools

This report uses the term *attrition* to describe the percentage of teachers by school location who are not teaching at that location in the subsequent year.

In Kentucky, the percentage of teachers who leave schools from one year to the next is 13.4 at the elementary level, 15.4 at the secondary level, and 16.4 at the middle school level.

School Level. On average, teacher attrition is highest in middle schools and lowest in elementary schools. The average annual attrition rates between 2008 and 2012 were 13.4 at the elementary level, 15.4 at the secondary level, and 16.4 at the middle school level.

Teacher attrition is higher in the state's more populated regions than in its rural regions. This higher attrition likely reflects the greater density of schools and employment options for teachers in more populated regions. It may also reflect a teacher population in metropolitan areas that is more likely to move among states.

Region. Teacher attrition is higher in the state's more populated regions than in its rural regions. This higher attrition likely reflects the greater density of schools and employment options for teachers in more populated regions. It may also reflect a teacher population in metropolitan areas that is more likely to move among states. Appendix F shows teacher attrition data for the state's 15 area development districts. Attrition is highest in the central, northern, and southern central regions (16 to 18 percent) and lowest in several eastern regions (11 percent). Depending on the region, higher attrition rates are explained by greater percentages of teachers moving among schools in a district, moving among districts, or not working in Kentucky public schools the subsequent year. Percentages of teachers not working in Kentucky public schools are highest in districts bordering other states; it is likely that many of the teachers who are no longer working in Kentucky take teaching positions in these bordering states.

The percentage of students who are minorities is more than three times as high (26 percent) in the quartile of schools with highest attrition as it is in the quartile of schools with lowest attrition (7 percent). The percentage of students in poverty is higher in the highest and lowest attrition quartile of schools.

School Demographic Characteristics. Overall, attrition is more closely associated with the percentage of students who are minorities in a school than with the percentage of students living in poverty. Table 2.1 divides the state's schools into four quartiles based on the 5-year average of the percentage of teachers who leave the school. Schools in the highest quartile have average attrition rates of 23 percent compared to 7 percent in the state's lowest quartile. The percentage of students who are minorities is more than three times as high (26 percent) in the quartile of

schools with highest attrition as it is in the quartile of schools with lowest attrition (7 percent). The relationship between attrition and poverty in the state is more complicated; the percentage of students living in poverty is above the state average in both the highest and lowest quartile of attrition.

Schools with higher attrition tend to have higher percentages of less-experienced teachers.

Schools with higher attrition tend to have higher percentages of less-experienced teachers. As shown in the table, 23 percent of teachers in the highest attrition quartile of schools have less than 3 years of experience, compared to 9 percent of teachers in the lowest attrition quartile. As explained in Chapter 1, these teachers are, on average, less effective than more experienced teachers.

Table 2.1
Average Percentage Of Students Who Are Minorities Or
Living In Poverty And Average Percentage Of Teachers
With Less Than 3 Years Of Experience
By Quartile Of School Attrition
2008-2012

Attrition Quartile	Average Attrition In Quartile	Average Of All Schools In Quartile		
		Percent Students In Poverty	Percent Minority Students	Percent Teachers <3 Years Experience
1 (high)	23%	62%	26%	23%
2	14	55	14	16
3	11	56	13	13
4 (low)	7	60	7	9

Note: Many of the schools in quartile 1 are located in Jefferson County. Many Jefferson County schools have implemented restaffing school reform models that require replacement of some school staff. However, attrition data in Jefferson County was similar in the years prior to implementation to what it was in the years after.

Source: Staff analysis of Kentucky Department of Education data.

In the state's two largest school districts, the schools with the highest attrition rates have much higher percentages of students who are living in poverty and students who are minorities.

In the state's two largest school districts, teacher attrition is strongly associated with the both the percentage of schools' students who are minorities and the percentage of students living in poverty. In these districts, the percentages of students who are living in poverty and are minorities are much higher in the schools with highest attrition than in the schools with lowest attrition (Appendix F).

Location, working conditions, and schools' demographic characteristics are the factors that most impact teachers' decisions to teach at a particular location. While salary can also play a role, it matters less than teachers' perceptions of the attractiveness of the school based on other factors.

Teacher Preferences. Research shows that location, working conditions, and schools' demographic characteristics are the factors that most impact teachers' decisions to teach at a particular school. Teachers prefer schools that are near their homes, where they grew up, or their undergraduate institution (Boyd; Toma). Teachers also prefer to teach in schools in which they perceive working conditions that support teaching and in which the demographic characteristics of the students most closely resemble their own (Jacob). Working conditions can include student discipline, family and community support, and quality of building leadership (Hirsch). Salary incentives alone are unlikely to be the primary factor influencing teachers' employment decisions. While salary can play a role in teachers' decisions to teach at a particular school, it matters less than teachers' perceptions of the attractiveness of the school based on other factors (Clotfelter. *Teacher*; Auguste 33).

Kentucky survey data show that teachers' perceptions of working conditions—especially in the area of school leadership—are associated with their desire to stay teaching in their schools.

Data collected through Kentucky's Teaching, Empowering, Leading and Learning (TELL) survey show that teachers' perceptions of working conditions—especially in the area of school leadership—are associated with their desire to stay teaching in their schools. Teachers who planned to stay in their schools were more than twice as likely to report positive working conditions (88 percent) as were those who planned to move (43 percent). When teachers were asked to identify which teaching conditions impacted their future employment plans, more teachers selected school leadership (27 percent) than any other factor. Teachers who intended to stay were much more likely than teachers who intended to move to give high ratings to school leadership in the areas of teacher support, addressing concerns about leadership, sharing a vision with the faculty, and addressing concerns.

The average attrition rate in the bottom 10 percent of schools ranked by teachers' perceptions of working conditions in 2011 was 20 percent—almost double the average attrition rate of 11 percent in the top 10 percent of schools based on teachers' reports of working conditions.

Relationship Between Working Conditions And Attrition In 2011. While working conditions reported in the TELL survey are associated with teachers' desire to move to other schools, they are not strongly associated with teachers actual departure from schools in the year following the survey. Overall, the relationship between the percentage of a school's teachers that agreed with the statement "overall my school is a good place to work and learn" in 2011, and the percentage of teachers who left a school in 2012 was weak ($r^2 < 0.1$). However, attrition rates in the bottom 10 percent of schools based on teachers' reports of working conditions were more strongly associated with attrition. The average attrition rate in the bottom 10 percent of schools (20 percent) was almost double

the average attrition rate in the top 10 percent of schools based on teachers' reports of working conditions (11 percent).

The relationship between school working conditions reported in one year and school attrition in the next is likely complicated by several factors. Many teachers working in rural schools may live in areas with few school employment options. Teachers in general may not have immediate options to leave a school even if they wish to do so. As will be described later in this chapter, it appears that some teachers may have left schools involuntarily in 2011. Thus, their responses on the TELL Kentucky survey would not be expected to align with their employment status.

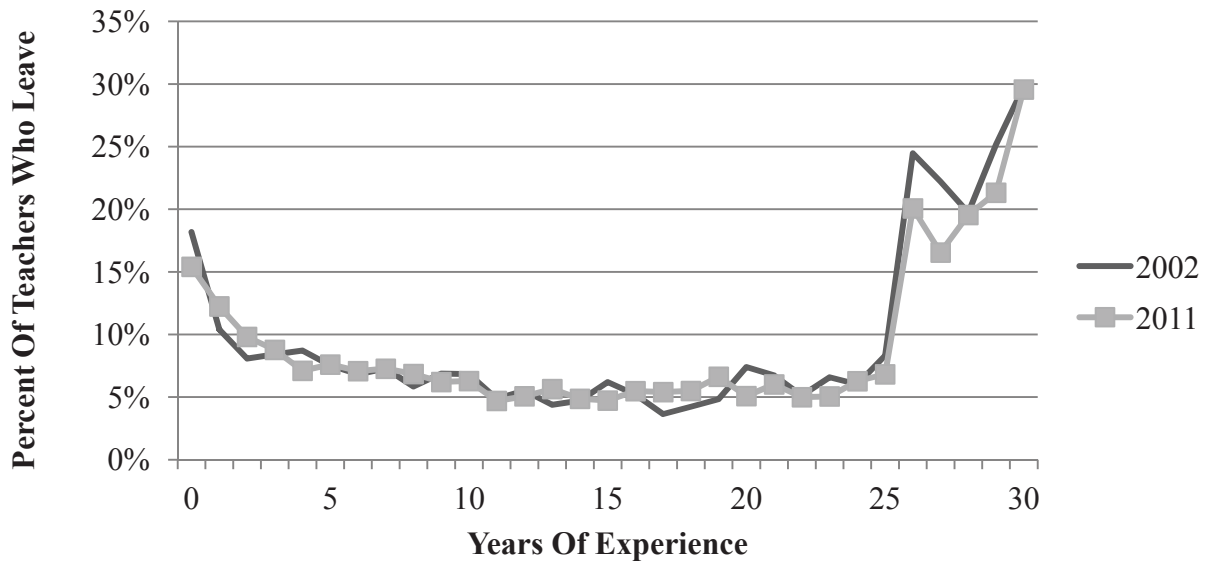
Teachers Not Teaching In Subsequent Years

Five percent of teachers annually are not teaching in the subsequent year. Teachers are most likely to leave in the early years of their career. However, many of the teachers who leave teaching in Kentucky will return to teaching in another year or another state.

Teachers leave teaching at every year of experience but are disproportionately likely to leave in the early years of teaching. In 2002, 18 percent of first-year teachers did not return the following year. In 2011, 15 percent of first-year teachers did not return the following year. National data also show higher mobility and attrition rates among teachers in the first 3 years.

Beginning Teachers. Analysis of Kentucky professional staff data show that teachers leave the data at every year of experience. However, until they are eligible for retirement at year 26 of teaching, teachers are most likely to leave in the early years of teaching. Figure 2.B shows the percentage of Kentucky teachers in 2002 and 2011 by years of experience who were not working in Kentucky public schools the subsequent year. In 2002, 18 percent of first-year teachers did not return the following year. In 2011, 15 percent of first-year teachers did not return the following year. In both 2002 and 2011 the percentage of teachers who left decreased gradually until teachers reached about 10 years of experience. National data also show higher mobility and attrition rates among teachers in the first 3 years (Kaiser).

Figure 2.B
Percentage Of Teachers Who Leave Teaching
By Years Of Experience
2002 And 2011

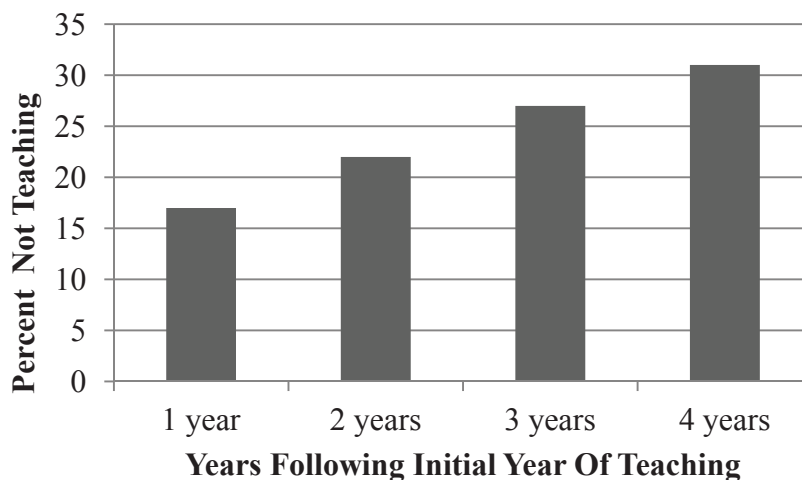


Note: Teachers who have 26 or more years of experience are presumed to have retired. Teachers with 30 years of experience or more are reported in a single category.
Source: Staff analysis of Kentucky Department of Education data.

Of the 2,308 Kentucky teachers who started teaching in 2008, roughly one-third (700) were no longer teaching after 4 years. Attrition rates of teachers certified through traditional and alternative routes were similar.

Figure 2.C shows the percentage of Kentucky teachers who were new in 2008 and no longer teaching in subsequent years. Of the 2,308 teachers who started teaching in 2008, roughly one-third (700) were no longer teaching after 4 years. Attrition rates of teachers certified through traditional and alternative routes were similar.

Figure 2.C
Percentage Of Teachers New In 2008
Not Teaching Subsequent Years



Source: Staff analysis of Kentucky Department of Education data.

Twenty-five percent or more of teachers who leave Kentucky education data in one year will return in a subsequent year.

Teachers Who Return. Many of the teachers who leave the education data in one year will return in a subsequent year. Staff analyzed data for teachers who left teaching in Kentucky in 2001. Of these teachers, 25 percent had returned to teaching in Kentucky for at least one year by 2012. Most of those who returned did so within 3 years of leaving.

It appears that some of the teachers who left teaching in Kentucky in 2011 may have done so involuntarily.

Involuntary Attrition. Existing data do not reveal what part of teacher attrition is voluntary and what part is caused by teachers whose contracts have not been renewed or who have been otherwise encouraged to leave their schools. However, it appears that some of the teachers who left teaching in Kentucky in 2011 may have done so involuntarily. Data collected through Kentucky's Teaching, Empowering, Leading, and Learning Survey in 2011 reported only 2 percent of teachers planning to leave education—less than one-third of the 7 percent who actually left in 2011 (5 percent left and 2 percent retired).¹

It is also possible that some of the teachers who leave in the early years are involuntary leavers who are not yet protected by tenure.

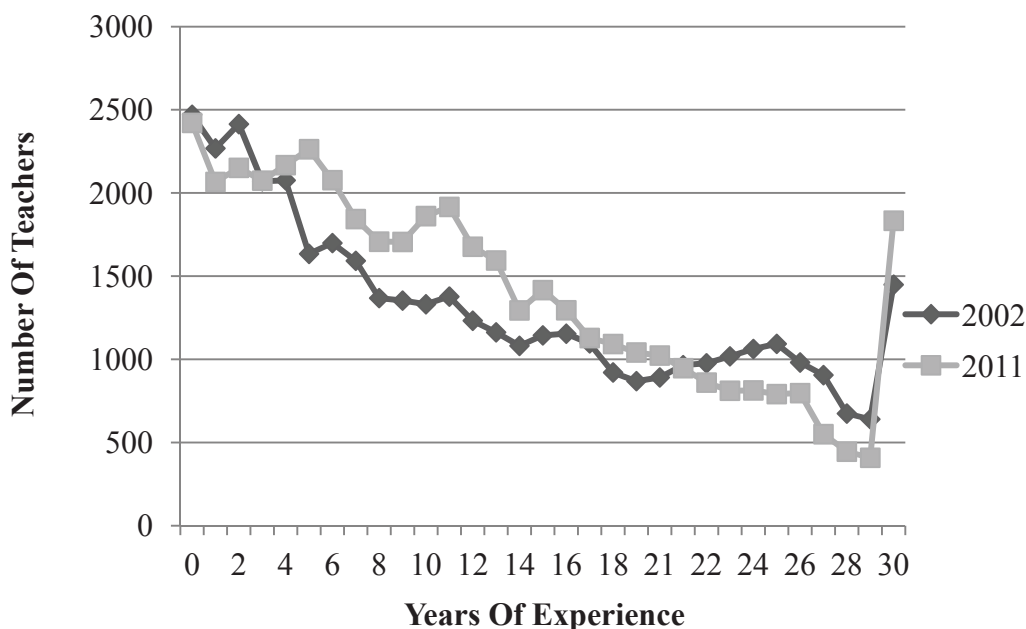
It is also possible that higher rates of attrition among teachers in the early years are explained in part by lack of tenure protection for these teachers. In Kentucky, teachers do not receive tenure until the end of their fourth year of teaching.

¹ There was less disparity between teachers' plans to move schools in Kentucky's Teaching, Empowering, Leading, and Learning Survey (6 percent) and the percent of teachers who actually moved schools within or across districts (7 percent) in 2011.

There is no anticipated increase in the approximately 2 percent of teachers who retire each year in the Commonwealth. There are more Kentucky teachers in the early and middle years of teaching than there are close to retirement.

Anticipated Retirements. There is no anticipated increase in the approximately 2 percent of teachers who retire each year in the Commonwealth. There are more Kentucky teachers in the early and middle years of teaching than there are close to retirement. Figure 2.D shows the total number of teachers by years of experience in the years 2002 and 2011. In both years, there were more teachers in the first year of teaching than any other year—6 percent in 2002 and 5 percent in 2011. In both 2002 and 2011 there were more teachers in the first 10 years of teaching (49 percent in 2001 and 51 percent in 2012) than in any other age range. The percentage of teachers with 20 or more years of experience dropped from 24 percent in 2002 to 19 percent in 2011.

Figure 2.D
Number Of Teachers By Years Of Experience
2002 And 2011



Note: Teachers with 30 years of experience or more are reported in a single category.
Source: Staff analysis of Kentucky Department of Education data.

Enrollment

The demand for teachers is also affected by increases or decreases in student enrollment. Enrollment changes in the future will likely affect districts in some areas of the state more than others.

The demand for teachers to fill annual vacancies could also be affected by increases or decreases in student enrollment. Enrollment changes in the future will likely affect districts in some areas of the state more than others. Census estimates project increases of 2.4 percent between 2010 and 2020 in the total population of children ages 5 through 19. The increase in total

public school enrollment could be greater or less than 2.4 percent depending on economic conditions and the percentages of children who are enrolled in public versus private schools. Predicted population growth is concentrated in the northern, central, and south central areas of the state. The population of school-aged children is predicted to decline by up to 2 percent in some of the eastern regions of the state.

The total number of teachers needed to meet enrollment growth will depend in part on state and local policies.

The total number of teachers that will be needed to meet enrollment growth will depend in part on state and local policies affecting areas such as class size, curriculum requirements, and use of new technologies.

Between 2003 and 2011 the number of teachers increased at a rate that was more than one and one-half times the rate of increase in the number of students.

Table 2.2 shows that between 2003 and 2011 the number of teachers increased at a rate that was more than one and one-half times the rate of increase in the number of students. The growth in percentage of teachers by position type was greatest among preschool and exceptional child teachers. The number of exceptional child teachers increased from 5,619 in 2003 to 6,746 in 2011, an increase of 20 percent.

Table 2.2
Enrollment Of Prekindergarten Through Grade 12 Students
And Total Number Of Full-Time Equivalent Teachers
2003 And 2011

	2003	2011	Percent Change 2003-2011
Student enrollment pre-K-12	667,866	696,458	4.3%
Total teachers	40,660	43,646	7.3
Pupil/teacher ratio	16.4	16.0	-2.9

Source: Staff analysis of Kentucky Department of Education data.

It is also possible that the total number of teachers could increase at a lower rate than student enrollment.

It is also possible that the total number of teachers could increase at a lower rate than student enrollment. Some analysts are proposing ways to reduce the number of teachers required to provide education without reducing the quality of education. These options include increasing class sizes for the most effective teachers, use of virtual education, and use of administrative and other staff to carry out nonteaching-related duties (Public).

Changes in graduation rates would likely increase the demand for secondary school teachers, whereas program reviews would likely increase the demand for world language teachers.

In recent years the General Assembly has considered proposals to increase the minimum age at which students are permitted to drop out of school from 16 to 18 and to require districts to conduct program reviews of world language programs. Changes in graduation rates would likely increase the demand for secondary school teachers, whereas program reviews would likely increase the demand for world language teachers.

Teacher Supply

Each year, about 85 percent of teaching positions are filled by teachers staying in that school; 7 percent are filled by teachers who moved from other Kentucky public schools; and 8 percent are replacement teachers not teaching in Kentucky the previous year.

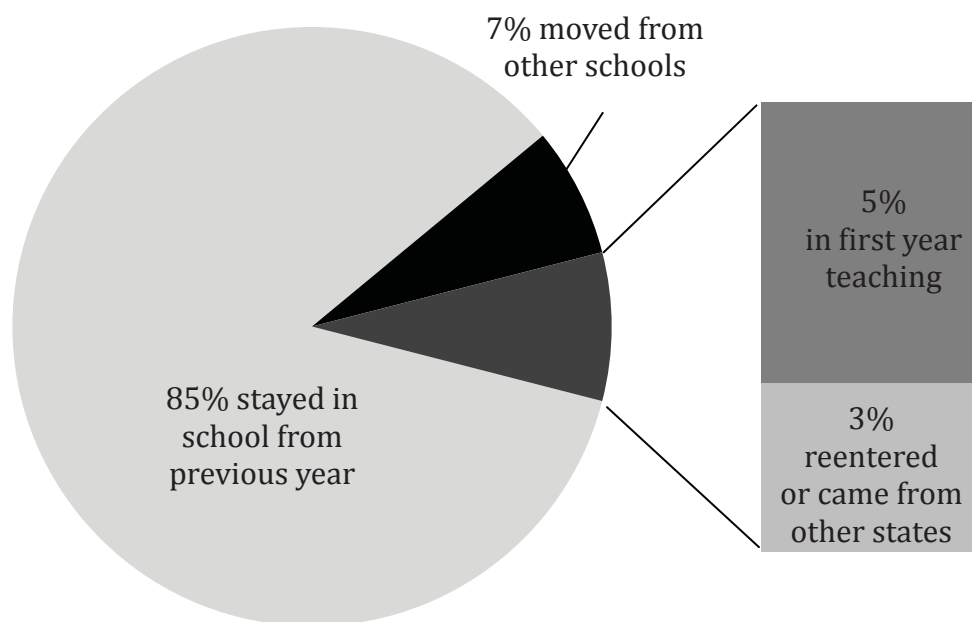
Figure 2.E shows the average annual percentage of teachers in 2008 through 2012 from each supply source. Each year, about 85 percent of teaching positions were filled by teachers who were teaching in the same school the previous year. Seven percent of teaching positions were filled by teachers who moved from other schools. The remaining 8 percent of teachers were replacement teachers not teaching in Kentucky the previous year.²

New teachers are the primary but not the sole source of replacement teachers. Five percent of teachers annually are new teachers, and 3 percent are teachers who have formerly taught in the commonwealth or in other states.

The figure divides replacement teachers into two groups: teachers in their first year of teaching (called new teachers in this report) and teachers who were reentering teaching in Kentucky or moving from other states. New teachers were 5 percent of all teachers in each year between 2008 and 2012, and teachers reentering or moving from other states were 3 percent of all teachers in each year. Thus, new teachers were the primary but not sole source of replacement teachers. In 2012, there were 3,529 teachers not teaching in Kentucky the previous year. Of these, 2,169 (about 60 percent) were new teachers and 1,360 (about 40 percent) were teachers who had formerly taught in the commonwealth or in other states.

² This 8 percent of replacement teachers is roughly equivalent to percentage of teachers reported earlier in this chapter who retire (2 percent), move to administration (1 percent), or leave teaching (5 percent).

Figure 2.E
Average Annual Percentage Of Teachers
By Supply Source
2008 Through 2012



Note: Teachers with 1 or more years of experience who were not teaching in Kentucky the previous year were assumed to be teachers reentering the profession in Kentucky or moving from other states.

Source: Staff analysis of Kentucky Department of Education data.

The average annual percentage of new teachers between 2008 and 2012 was 4.8 at the elementary level, 6.0 at the middle, and 5.4 at the secondary.

Because attrition rates are higher at the middle and secondary levels than they are at the elementary level, the percentage of teachers from each source is also different. The average annual percentage of new teachers between 2008 and 2012 was 4.8 at the elementary level, 6.0 at the middle, and 5.4 at the secondary.

Candidates Completing Teacher Preparation Programs

It is likely that most of Kentucky's new teachers are graduates of teacher preparation programs in the state.

New teachers are the primary source of supply to meet the annual demand for replacement teachers. It is likely that most of Kentucky's new teachers are graduates of teacher preparation programs in the state.

EPSB's data dashboard reports the number of individuals completing programs leading to certification in different content areas and by individual institution.

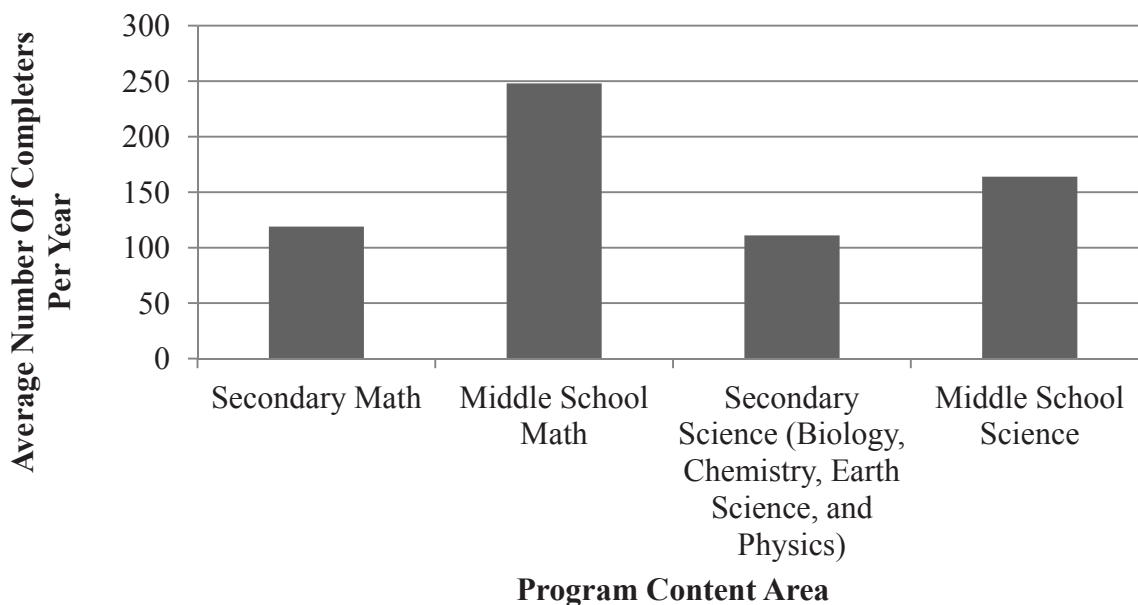
EPSB's data dashboard provides data on the number of individuals completing programs leading to certification in specific content areas and by individual institution. The dashboard currently disaggregates teacher completer data by certificate type,

demographic data, and licensure score (Commonwealth Education).

Twice as many candidates complete programs each year in middle school math versus secondary math. The number of candidates completing middle school science programs is also higher than those completing secondary science programs.

It appears that disproportionate numbers of teachers are being prepared in some content areas versus others. Figure 2.F shows the number of candidates (both traditional and alternative) completing programs in secondary science (includes chemistry, biology, earth science, and physics) and math and middle school science and math. Because the number of students served by secondary schools is approximately 1.3 times greater than the number of students served by middle schools, one would expect the demand for teachers to be at least as great at the secondary as at the middle school level.³ However, twice as many candidates complete programs each year in middle school math as in secondary math. Similarly, disproportionately greater numbers of candidates complete middle school science than secondary science preparation programs.

Figure 2.F
Average Number Of Mathematics And Science Program Completers
2008-2012



Source: Staff analysis of Education Professional Standards Board data.

³ There were 189,248 students enrolled in secondary school and 148,807 in middle school in 2011. High school students must take at least one math class each year, but are only required to have three science credits (comparable to one class each year) to graduate.

Supply Of Program Completers Compared To Estimated Demand For New Teachers

Assuming that data are similar in each content area, the number of new teacher program completers needed each year can be computed as a function of teacher counts and the percentage of teachers who are new each year.

Assuming that data on attrition, new teachers, and teachers reentering the profession or moving from other states are similar in each content area, the number of new teacher program completers needed each year can be computed as a function of teacher counts and the percentage of teachers who are new each year.

Table 2.3 shows the estimated number of new teachers needed to fill vacancies in each content area. Staff calculated these estimates by multiplying the total number of estimated 2012 positions in each content area by the average percentage of new teachers at the appropriate school level. The table also shows the average annual number of program completers in each content area based on staff analysis of the EPSB data. The number of program completers was divided by the number of estimated vacancies to arrive at the ratio of completers to vacancies to be filled by new teachers shown in the final column.

Content areas in which fewer candidates are completing programs than will likely be needed to fill vacancies are chemistry, earth science, physics, and English as a second language.

Content areas in which fewer candidates are completing programs than will likely be needed to fill vacancies are chemistry, earth science, physics, and English as a second language. Anticipated shortages in high school science are greater than shortages as measured by emergency certificates and unfilled positions described in Chapter 1. This discrepancy reflects regulatory changes to certification requirements for high school science teachers in 2000 that have yet to have their full effect. Prior to 2001, high school science teachers were not required to be specifically certified to teach each high school content area. As the teachers holding these broader certificates retire or leave the profession, they must be replaced by applicants holding more specific certificates.

Content areas in which more than twice as many candidates are completing programs as anticipated vacancies are exceptional children and middle school math, science, and social studies.

Content areas in which more than twice as many candidates are completing programs as there are anticipated vacancies are exceptional children and middle school math, science, and social studies. At an average of 1,394 each year, more candidates are completing elementary programs than are completing any other program. When the estimated number of elementary vacancies is considered, however, replacement ratio for elementary teachers (1.9) is not higher than for most content areas.

Table 2.3
Ratio Of Estimated Annual Vacancies To Be Filled By New Teachers
To Average Number Of Program Completers 2008-2012
By Content Area

 More than twice as many completers as anticipated vacancies  Fewer completers than anticipated vacancies

	Estimated Number Of Vacancies To Be Filled By New Teachers Based On 2012 Teacher Counts	Average Annual Number Of Program Completers 2008-2012	Ratio Of Program Completers To Projected Vacancies
Secondary			
Biology	57	65	1.1
Chemistry	43	29	0.7
Earth science	43	8	0.2
English	104	177	1.7
Math*	93	119	1.3
Physics	33	9	0.3
Social studies	104	202	1.9
Middle			
English	112	200	1.8
Math	104	248	2.4
Science	80	164	2.1
Social studies	79	247	3.1
Elementary And Preschool			
Elementary P-5	748	1,394	1.9
Early childhood (preschool)	83	115	1.4
All Grades			
English as a second language	13	2.8	0.2
Exceptional children	336	790	2.4
World languages	54	74	1.4

*Vacancies for secondary math were computed as a percentage of teachers holding secondary math certificates. Because some teachers holding middle school math certificates are teaching algebra in high schools, the actual number of secondary math vacancies may be higher and the ratio of program completers to estimated vacancies lower.

Note: The table does not include data on teachers in technical or vocational education positions, as complete data for these teachers were not available for this study. The table also excludes content areas such as art, music, and physical education that had relatively low numbers of shortage indicators in 2012. Appendix B explains the method OEA used to estimate the number of teachers by content area.

Source: Staff analysis of data from the Education Professional Standards Board and the Kentucky Department of Education.

It is likely that the supply of teachers completing programs leading to certification in moderate and severe disabilities relative to the demand for these teachers is less than for all exceptional children.

In some cases, replacement ratios reported in Table 2.2 mask differences in the number of candidates completing degree programs within content areas. For example, of the 790 average annual program completers in exceptional child programs, fewer than 10 percent were in programs leading to certification in moderate and severe disabilities. Approximately 20 percent of exceptional child students require teachers with certificates in moderate and severe disabilities. Counts of exceptional child teachers of students with moderate and severe disabilities are not available so OEA was not able to calculate anticipated vacancies for these teachers. It is likely however, that the supply of teachers completing programs leading to certification in moderate and severe disabilities relative to the demand for these teachers is less than the ratio reported for all exceptional child teachers in Table 2.2.

In the area of world languages, more than 70 percent of candidates are completing programs for certification in Spanish. Few candidates are completing programs for certification to teach Chinese, or other languages such as Arabic and Japanese for which there may be a growing demand. Together candidates completing programs in certification for these three languages are less than 10 percent of all world language program completers.

The Office of Education Accountability is not aware of any widely accepted standard for determining the ideal ratio of applicants to vacant positions. Because teacher labor markets are local, statewide ratios do not necessarily reflect supply versus demand in particular regions or types of schools.

OEA is not aware of any widely accepted standard for determining the ideal ratio of applicants to vacant positions. In Virginia, positions for which there were fewer than three applicants are considered a shortage indicator. Because teacher labor markets are local, statewide ratios do not necessarily reflect supply versus demand in particular regions or types of schools. In the future, the program completer to anticipated vacancy analysis presented in this report might be refined to reflect ratios likely to apply in particular regions. This analysis would require data showing the likelihood that candidates completing programs at particular institutions would be willing to teach in particular regions or school locations.

Kentucky Teacher Scholarships

The General Assembly funds two scholarship programs that provide financial assistance to applicants enrolled in education preparation programs or who declare education as a major field of study. While these programs may serve to increase the number of students completing education preparation programs, they are not focused on particular content areas.

Minority Educator Recruitment and Retention Scholarship

The Minority Educator Recruitment and Retention scholarship provides financial assistance to Kentucky residents who are minorities and have declared teacher education as a major field of study.

The Minority Educator Recruitment and Retention (MERR) scholarship provides financial assistance to Kentucky residents who are minorities and have declared teacher education as a major field of study. Applicants can receive annual awards of up to \$5,000 if they attend one of Kentucky's state universities and awards of up to \$2,000 if they attend a Kentucky community or technical college. Scholarship recipients must teach one semester in Kentucky for every semester of scholarship received (Commonwealth. Dept. Minority). KDE sets guidelines for the use of MERR scholarship funds and provides MERR scholarship grants to Kentucky postsecondary institutions. The Kentucky Higher Education Assistance Authority monitors applicants' fulfillment of scholarship terms and repayment of loans for those applicants who do not teach in Kentucky schools.

Funding for the Minority Educator Recruitment and Retention scholarship program is included in funds allocated to the Kentucky Department of Education for a variety of programs related to Educator Quality & Diversity. Approximately \$1.3 million was allocated for these programs in 2013 and 2014, reduced from nearly \$1.9 million in 2010.

Funding for the MERR scholarship program is included in funds allocated to KDE for a variety of programs related to Educator Quality & Diversity (Statewide Teacher Recruitment). Approximately \$1.3 million was allocated for these programs in 2013 and 2014, reduced from nearly \$1.9 million in 2010. As directed by KRS 161.165, KDE administers a variety of programs aimed at attracting and retaining minority educators in the Commonwealth. These programs are described in KDE's Diversification Program Report (Commonwealth. Dept. Division).

Compared to Teacher Scholarship recipients, a substantially lower percentage of Minority Educator Recruitment and Retention scholarship recipients have taught for at least one semester in Kentucky schools, and a substantially higher percentage are in default on scholarships that were converted to loans.

Since the program was created in 1991, 2,013 applicants have received MERR scholarships. Of these, 48 percent have taught for at least one semester in Kentucky schools, 26 percent have repaid their scholarships when they were converted to loans, and 26 percent are in default on scholarships that were converted to loans. Compared to Teacher Scholarship recipients, a substantially lower percentage of MERR scholarship recipients have taught for at least one semester in Kentucky schools, and a substantially higher percentage are in default on scholarships that were converted to loans. This may reflect differences in the eligibility requirements applied to scholarship applicants. Eligibility requirements for MERR scholarships are developed by KDE and are not guided by statute or regulation. In a 2012 summary of the MERR scholarship program, KDE reported revision of the MERR Student and Coordinator Handbook to reflect forthcoming changes to the regulations governing admission to teacher preparation programs. These changes will increase minimum GPA from 2.5 to 2.75 and also require applicants to pass the PRAXIS I Test prior to admission.

Recommendation 2.1**Recommendation 2.1**

The Kentucky Department of Education should set guidelines that target Minority Educator Recruitment and Retention scholarships more directly at applicants likely to teach in Kentucky public schools.

Teacher Scholarship Program

The Teacher Scholarship program provides financial assistance to Kentucky residents enrolled in teacher preparation programs.

As authorized by KRS 164.769, the Teacher Scholarship program provides financial assistance to Kentucky residents enrolled in teacher preparation programs. Applicants who demonstrate financial need and meet their programs' GPA requirements can receive up to a total of \$12,500 if they are undergraduates and \$7,500 if they are postbaccalaureate students. Applicants do not have to be enrolled in programs leading to certification in critical shortage areas.

Scholarship recipients must teach one semester in Kentucky public schools for every semester of scholarship received. Teachers teaching in shortage areas can repay two semesters of scholarship for every semester taught.

Scholarship recipients must teach one semester in Kentucky public schools for every semester of scholarship received. Teachers teaching in critical shortage areas as defined by the Commissioner of Education can repay two semesters of scholarship for every semester taught. In the past, teacher shortage areas identified for the purposes of Kentucky teacher scholarships have been the same as those submitted to the federal government. Data presented in this report show evidence of greater need in some of these areas than in others.

Beginning in 2010 only a small portion of the more than \$2 million in teacher scholarship funds have been awarded to new teacher scholarship applicants.

The teacher scholarship program is administered by the Kentucky Higher Education Assistance Authority and funded by proceeds from the Kentucky lottery. Since 2009, proceeds have totaled more than \$2 million annually, reaching nearly \$2.3 million in 2012 (Gilpatrick). However, beginning in 2010, only a small portion of these funds have been available to award scholarships to first-time applicants.

House Bill 480 passed by the General Assembly in 2009 has led the Kentucky Higher Education Assistance Authority to redirect teacher scholarship funds to forgive loans provided to teachers through the federal Best in Class program after federal funds for this program were reduced.

House Bill 480 passed by the General Assembly in 2009 instructed the KHEAA to redirect Teacher Scholarship funds in years when funds were insufficient to provide scholarships to all first-time applicants. In these years, funding is provided first to eligible prior-year Teacher Scholarship recipients and then redirected to help forgive loans provided to teachers who have received Best in Class loans prior to 2008 (Commonwealth. Kentucky). Best in Class loans were provided to students seeking initial or continuing certification. Unlike teacher scholarship recipients, Best in Class recipients did not have to demonstrate financial need and could use

loans to fund continuing education beyond what is required for initial certification. Loans were provided by the Kentucky Higher Education Student Loan Corporation on behalf of the Federal Family Education Loan program. In recent years, federal funding available to forgive Best in Class loans has been reduced.

Since the Teacher Scholarship program was created in 1994, 6,006 applicants have received scholarships.

Since the Teacher Scholarship program was created in 1994, 6,006 applicants have received scholarships. Of these, 77 percent have taught at least one semester in Kentucky public schools, 18 percent have repaid the scholarships when they were converted to loans, and 5 percent are in default on scholarships that were converted to loans (Staff calculation using data from KHEAA).

Due to changes to KRS 164.769 in 2009, teacher scholarships dropped from 601 in financial year 2009 to 12 in financial year 2012.

Due to changes to KRS 164.769 in 2009, teacher scholarships dropped from 601 in financial year 2009 to 12 in financial year 2012.

Teacher scholarships as defined in statute are available to applicants enrolled in teacher certification programs in any content area. If the scholarships were restricted to applicants enrolled in certification programs in the most critical shortage areas, funds might again be available for first-time teacher scholarships.

Teacher scholarships as defined in the statute are currently available to applicants enrolled in programs leading to teacher certification in any content area. Should the scholarships be restricted to only those applicants enrolled in programs leading to certification in the most critical shortage areas, it is possible that funds sufficient to award scholarships to first-time teacher scholarship applicants would again be available.

Examples Of Policies In Other States

Staff review of programs in surrounding and nearby states identified a number of programs that are focused on increasing supply of teachers in shortage areas or in hard-to-staff schools.

Teacher Scholarships

Virginia provides teacher scholarships for applicants willing to teach in shortage areas and a privately funded initiative in Arkansas provides scholarships to applicants willing to teach in rural schools.

Virginia provides teacher scholarships to applicants willing to teach in critical shortage areas. In Virginia these areas are determined by an annual survey of superintendents. Recipients can receive awards of up to \$3,720. In Arkansas, the privately funded Rural Schools Partnership sponsors the Ozarks Teacher Corps. The corps provides applicants willing to teach in rural schools scholarships of up to \$4,000 for their junior and senior years in college. Applicants must be from a rural community in the Missouri Ozarks, enrolled in teacher preparation programs and prepared to teach at least 3 years in their home communities.

Salary Incentives

Virginia, Georgia, and Ohio provide salary incentives for teachers in low-achieving or hard-to-staff schools.

The Virginia Middle School Teacher Corps provides up to \$10,000 for middle school teachers to teach in schools with low math performance. The Virginia performance-pay incentives initiative provides competitive grants of up to \$5,000 for exemplary teachers willing to work in hard-to-staff schools. Georgia has proposed to use \$3.6 million in federal Race to the Top Funding to provide salary bonuses for “high-quality” educators willing to relocate to rural areas. Ohio is using Race to the Top funding to provide merit pay for teachers willing to teach in a shortage area in a Title I school designated in need of improvement.

Data on the effects of these programs were not available. However, a report on the federally funded Teacher Talent Initiative suggests that salary incentives alone are not enough to attract most teachers to hard-to-staff schools.

Data on the effects of these programs were not available. However, a report on the federally funded Teacher Talent Initiative suggests that salary incentives alone are not enough to attract most teachers to hard-to-staff schools. The program offered high-performing teachers in five states annual salary supplements of \$10,000 to transfer into lower-achieving schools. One-quarter of eligible teachers completed an application, and 6 percent of teachers transferred schools (Glazerman). Data on the impact of the program on student achievement are not yet available.

Future Calculations Of Teacher Shortage

Data reported in this chapter suggest that shortages of certified teachers may be greater in some areas in the future than they are currently. Further, among the areas that have been submitted by the Kentucky Department of Education to the United States Department of Education in the past, shortages are greater in some areas than others.

Data contained in this report suggest that, among the areas that have been submitted by KDE to the United States Department of Education in the past, shortages are greater in some areas than others. Further, shortages of certified teachers may be greater in some areas in the future than they are currently. Data on the distribution of teachers considered to be effective suggests that the supply of these teachers willing to teach in schools serving high percentages of minority or poor children is lower than it is for other schools.

The Commissioner of Education has the authority to identify shortage areas in the Commonwealth as relevant to existing programs. However, existing scholarship programs are not limited to teachers in shortage areas. Further, data that would be useful to informing the Commissioner’s recommendation are not easily available.

Recommendation 2.2

Recommendation 2.2

If it is the intent of the General Assembly to provide funding for programs designed to address teacher shortages, it should consider directing a specific agency or entity to be responsible for periodically analyzing and reporting teacher supply and demand data in the Commonwealth.

Works Cited

American Association for Employment in Education. *Educator Supply and Demand in the United States*. Columbus: American Association for Employment in Education, 2002.

---. *Educator Supply and Demand in the United States*. Columbus: American Association for Employment in Education, 2010.

Auguste, Byron, Paul Kihn, and Matt Miller. *Closing the Talent Gap: Attracting and Retaining Top-Third Graduates to Careers in Teaching*. Washington: McKinsey and Co.
<mckinseysociety.com/downloads/reports/Education/Closing_the_talent_gap.pdf> (accessed June 15, 2012).

Boyd, Donald, Hamilton Lankford, Susannah Loeb, and James Wyckoff. "The Draw of Home: How Teachers' Preferences for Proximity Disadvantage Urban Schools." *Journal of Policy Analysis and Management*, 24(1), 113-132, 2005.

Carr, Mike. Personal communication. Sept. 20, 2012.

Clotfelter, Charles, Helen Ladd, and Jacob Vigdor. *How and Why Do Teacher Credentials Matter for Student Achievement?* Washington: National Center for Analysis of Longitudinal Data in Education Research, 2007.

Clotfelter, Charles, Helen Ladd, and Jacob Vigdor. *Teacher Mobility, School Segregation, and Pay-Based Policies to Level the Playing Field*. Washington: National Center for Analysis of Longitudinal Data in Education Research, May 2010. <www.urban.org/UploadedPDF/1001429-teacher-mobility.pdf> (accessed Aug. 15, 2012).

Clotfelter, Charles, Helen Ladd, Jacob Vigdor, and Justin Wheeler. "High-Poverty Schools and the Distribution of Teachers and Principals." Washington: National Center for Analysis of Longitudinal Data in Education Research, 2007.

Commonwealth of Kentucky. Department of Education. Division of Next Generation Professionals. *Diversification Program Report*. Frankfort: 2012.

---. ---. Minority Educator Recruitment and Retention Scholarships. <www.education.ky.gov/kde/> (accessed June 5, 2012).

---. Education Professional Standards Board. EPSB Data Dashboard.
<<https://wd.kyepsb.net/EPSB.WebApps/Dashboard/DashbrdWeb/>> (accessed July 1, 2012).

---. ---. *Survey of Alternative Certification (Option 6) Teachers 2006-07 School Year*.
<www.kyepsb.net/Reports/index.asp> (accessed Oct. 1, 2012).

---. Kentucky Higher Education Assistance Authority. "Conversion Scholarship/Loan Program."
<www.kheaa.com/website/kheaa/teacher?main=1> (accessed June 5, 2012).

Darling-Hammond, Linda, Ruth Chung, and Fred Frelow. "Variation in Teacher Preparation: How Well Do Different Pathways Prepare Teachers to Teach?" *Journal of Teacher Education* 53 (4), 286-302, Sept. 2002.
<www.sagepub.com/dvlastudy/articles/Darling-Hammond%20article.pdf> (accessed June 15, 2012).

Gilpatrick, Rebecca. "Re: OEA teacher shortage report." Email to Deborah Nelson. April 5, 2012.

Glazerman, Steve, Ali Protik, Bing-ru Teh, Julie Bruch, and Neil Seftor. *Moving High-Performing Teachers: Implementation of Transfer Incentives in Seven Districts*. Washington: National Center for Educational Evaluation and Regional Assistance, April 2012.

Goldhaber, Dan. "Everyone's Doing It, But What Does Teacher Testing Tell Us About Teacher Effectiveness?" Seattle: Center on Reinventing Public Education, 2006.

Hirsch, Eric, Andrew Sioberg, and Patrick Dougherty. "TELL Kentucky: Creating Supportive School Conditions for Enhancing Teacher Effectiveness." Santa Cruz: New Teacher Center, 2012.

Humphrey, Daniel, and Marjorie Wexler. "Insights Into Alternative Certification: Initial Findings From a National Study." *Teachers College Record*, 109 (3), 2007.

Jacob, Brian "The Challenges of Staffing Urban Schools With Effective Teachers." *The Future of Children*. Vol. 17, no. 1, 2007.

Kaiser, Ashley, and Freddie Cross. "Beginning Teacher Attrition and Mobility: Results From the First Through Third Waves of the 2007-08 Beginning Teacher Longitudinal Study." Washington: National Center for Education Statistics, 2011.

Keigher, Ashley, and Freddie Cross. "Teacher Attrition and Mobility: Results From the 2008-09 Teacher Follow-Up Survey." Washington: National Center for Education Statistics, 2010.

Levine, Arthur. *Educating School Teachers*. Washington: The Education Schools Project. Sept. 2006. <www.edschools.org/teacher_report.htm> (accessed Aug. 25, 2012).

Public Impact. "Redesigning Schools: Models to Reach Every Student With Excellent Teachers." <opportunityculture.org/wp-content/uploads/2012/05/Model_Summaries-Public_Impact.pdf> (accessed Oct. 10, 2012).

Ritter, Chay. "Re: NBPTS allocation vs. need." Email to Deborah Nelson. April 27, 2012.

Rivkin, Steven, Eric Hanushek, and John Kain. "Teachers, Schools and Academic Achievement." *Econometrica*, 79, 418-458. March 2005.

Teach Kentucky. *Prichard Handout September 2012*. <www.teachkentucky.com/images/stories/TeachKentucky/tky%20prichard%20handout%20sept%202012.pdf> (accessed July 16, 2012).

Toma, Eugenia, Jacob Fowles, JS Butler, Josh Cowen, and Meg Streams. "The Great Divide: Teacher Sorting in Appalachian and Non-Appalachian Schools." Paper presented at the 37th Annual Conference of The Association for Education Finance and Policy. Hyatt Regency Boston. March 2012.

Wilson, Susan (ed.). *Teacher Quality*. Education Policy White Paper. Washington: National Academy of Education, 2009.

Appendix A

Emergency Certificate By Content Area 2008-2012

Content Area	2008	2009	2010	2011	2012	Total 2008- 2012
Learning and behavior disorders	80	60	50	23	15	228
Mathematics secondary	38	26	30	16	10	120
Preschool	21	26	38	20	14	119
World languages	32	33	34	22	8	129
Moderate and severe disabilities	30	21	28	23	11	113
Chemistry	35	22	26	11	12	106
English as a second language	28	30	29	15	4	106
Elementary	22	19	16	10	12	79
School media librarian	23	18	16	12	5	74
English secondary	21	21	10	8	8	68
Earth science	18	19	12	12	6	67
Social studies	22	12	16	4	7	61
Middle school science	20	9	14	6	11	60
Middle school mathematics	19	16	14	8	3	60
Health	14	17	9	7	6	53
Physics	13	12	13	8	3	49
Middle school English	17	11	7	6	7	48
Physical education	15	9	7	5	8	44
Biology	15	11	11	4	2	43
Middle school social studies	9	7	6	6	1	29
Family and consumer science	5	8	9	2	2	26
Reading	9	4	8	4	1	26
Music	5	5	8	3	3	24
Dropout prevention/alternative programs	8	9	2	1	1	21
Art	7	4	2	2	4	19
Business education	5	6	3	3	2	19
Arts/humanities	5	7	4	2	0	18
Hearing impaired pupils	4	1	7	4	1	17
Driver education	3	1	3	1	4	12
Gifted education	7	3	2	0	0	12
Visually impaired pupils	5	3	2	0	1	11

Source: Staff analysis of data from the Education Professional Standards Board.

Appendix B

Data Collection Issues

Teacher Counts

Counts of teachers in individual content areas are not available from a single data source in the commonwealth. KDE's PSD data provides counts preschool and exceptional child teachers. However, exceptional child teachers cannot be disaggregated by particular type such as moderate/severe disabilities and learning and behavior disorders. The count of elementary school teachers provided in PSD includes special area teachers such as art, physical education, and reading specialists and thus cannot be used to predict vacancies that require elementary certificates. PSD also provides counts of middle and secondary school teachers but does not indicate the content area in which teachers are teaching.

Counts of teachers by content area could be derived through analysis of KDE's Infinite Campus data that contains course descriptions for every class taught in Kentucky public schools. They could also be derived from analysis of EPSB's Local Educator Assignment Data. These calculations would require additional analysis of state-level data but would not require additional data submission at the local level.

Methods Used By OEA To Derive Teacher Counts For This Study. OEA used PSD data to count preschool and exceptional child teachers. Certified staff permitted to teach preschool were also included in position counts. For all other positions, OEA counted the number of working teachers holding certificates that allowed them to teach all classes offered in a particular content area at the appropriate school level who were also working at that school level. To do this, OEA used EPSB data on certificates held by all teachers working in 2008 through 2012 and linked it with KDE's PSD.

To derive counts of secondary math teachers, for example, OEA counted all of the teachers working in secondary schools who held certificates that permitted them to teach all grades 9-12 and all classes required for graduation: algebra I, algebra II, and geometry.¹ OEA did not count teachers with middle school math certificates who were employed in secondary schools as high school math teachers because these teachers are not permitted to teach all grade levels and classes. Teachers holding professional mathematics certificates grades 8-12 or any other certificate that permitted them to teach secondary math classes were counted as secondary math teachers only if they were employed as teachers in a secondary school. It is possible that in some cases teachers holding certificates that allowed them to teach math classes were not actually using these certificates to teach math. It is also possible that some of the teachers counted were not full-time teachers.

¹ Most of these teachers could also teach Advanced Placement classes and calculus.

Unfilled Positions

To determine unfilled positions in the state, KDE collects data on positions that are advertised on the Kentucky Educator Placement Service (KEPS) website after the beginning of the school year. Over time, data on unfilled positions can indicate areas of the state or types of schools that have difficulty filling positions. Data on unfilled positions can also provide indicators absent in certificate data. For example, a school that is unable to fill an advertised world language position may decide not to offer a class rather than hire a teacher with an emergency certificate.

Not every position advertised after the beginning of the school year is necessarily an indicator of teacher shortage. In some cases, teachers may have suddenly vacated a position, forcing a district to advertise after the beginning of the school year. In others, a district may be advertising a position that was newly created in response to unexpected student enrollments. Many positions posted later in a semester may be vacancies anticipated for the following semester rather than positions that a district has been unable to fill. School districts are required to post vacancies for 30 days prior to filling a position. Positions that are posted during this time do not necessarily represent vacancies that are not filled.

When calculating data on unfilled positions in the future, KDE could distinguish between all positions posted and unfilled positions by considering only those positions that have been posted for longer than the 30 days required by KRS 160.380 and by collecting data early in the fall semester, before newly created or anticipated positions are posted. KDE could also maintain annual data, including district and school locations of unfilled positions, for future analysis and consider modifying the KEPS database to allow districts to clarify whether a position posted is for a current or anticipated vacancy.

Appendix C

Shortage Positions By Region and District

Average Annual Shortage Positions By Area Development District 2008-2012

Area Development District	Districts	Total Shortage Positions	Total Teachers	Percent Shortage Positions
Barren River	Edmonson, Monroe, Glasgow Ind, Bowling Green Ind, Butler, Barren, Caverna Ind, Allen, Hart, Logan, Warren, Russellville Ind, Simpson, Metcalfe	535	14,253	3.8%
Big Sandy	Magoffin, Pikeville Ind, Pike, Floyd, Martin, Paintsville Ind, Johnson	301	8,372	3.6
Bluegrass	Boyle, Mercer, Estill, Garrard, Berea Ind, Harrison, Woodford, Scott, Madison, Lincoln, Powell, Anderson, Fayette, Clark, Jessamine, Burgin Ind, Bourbon, Nicholas, Frankfort Ind, Danville Ind, Franklin, Paris Ind, Harrodsburg Ind	1,488	36,400	4.1
Buffalo Trace	Bracken, Robertson, Lewis, Mason, Fleming, Augusta Ind	153	3,025	5.1
Cumberland Valley	Middlesboro Ind, East Bernstadt Ind, Harlan, Pineville Ind, Clay, Jackson, Rockcastle, Bell, Barbourville Ind, Harlan Ind, Whitley, Laurel, Knox, Corbin Ind, Williamsburg Ind	482	13,672	3.5
FIVCO	Raceland-Worthington Ind, Ashland Ind, Boyd, Russell Ind, Carter, Elliott, Greenup, Lawrence, Fairview Ind	351	6,991	5.0
Gateway	Rowan, Morgan, Menifee, Montgomery, Bath	156	4,015	3.9
Green River	Daviess, McLean, Henderson, Hancock, Webster, Owensboro Ind, Ohio, Union, Providence Ind	482	10,823	4.5
Kentuckiana	Anchorage Ind, Trimble, Spencer, Oldham, Jefferson, Shelby, Bullitt, Eminence Ind, Henry	1,790	41,884	4.3
Kentucky River	Knott, Letcher, Hazard Ind, Jackson Ind, Perry, Leslie, Breathitt, Lee, Jenkins Ind, Wolfe, Owsley	230	6,163	3.7
Lake Cumberland	Adair, Wayne, Somerset Ind, Russell, Campbellsville Ind, Taylor, McCreary, Casey, Clinton, Green, Cumberland, Monticello Ind, Science Hill Ind, Pulaski	387	10,249	3.8
Lincoln Trail	Elizabethtown Ind, Nelson, Washington, Marion, LaRue, Grayson, Hardin, Meade, Bardstown Ind, Breckinridge, Cloverport Ind, West Point Ind	583	13,029	4.5
Northern Kentucky	Fort Thomas Ind, Owen, Ludlow Ind, Beechwood Ind, Newport Ind, Pendleton, Dayton Ind, Boone, Kenton, Bellevue Ind, Erlanger-Elsmere Ind, Wiliamstown Ind, Walton-Verona Ind, Silver Grove Ind, Gallatin, Campbell, Grant, Carroll, Southgate Ind, Covington Ind	893	20,436	4.4
Pennyrile	Dawson Springs Ind, Muhlenberg, Caldwell, Lyon, Livingston, Trigg, Crittenden, Hopkins, Todd, Christian	563	10,376	5.4
Purchase	McCracken, Paducah Ind, Marshall, Murray Ind, Graves, Fulton, Calloway, Ballard, Hickman, Fulton Ind, Mayfield Ind, Carlisle	369	9,382	3.9
State		8,762	209,070	4.2

Source: Staff analysis of data from the Kentucky Department of Education and Education Professional Standards Board.

**Average Annual Shortage Positions By District
2008-2012**

District	Shortage Positions	All Positions	Percent Shortage Positions
West Point Independent	12	49	24%
Augusta Independent	22	109	20
Union County	122	803	15
Williamsburg Independent	42	320	13
Cloverport Independent	13	110	12
Russellville Independent	40	342	12
Fulton County	25	238	11
Trimble County	44	436	10
Covington Independent	142	1,414	10
Barbourville Independent	18	181	10
Eminence Independent	21	212	10
Henry County	64	697	9
Beechwood Independent	32	360	9
Paintsville Independent	25	284	9
Bellevue Independent	23	258	9
Jenkins Independent	19	224	8
Owen County	49	596	8
Carroll County	48	601	8
Pineville Independent	16	205	8
Crittenden County	31	401	8
Frankfort Independent	26	341	8
Webster County	55	731	8
Danville Independent	49	669	7
Bracken County	27	371	7
Carlisle County	23	313	7
Allen County	66	918	7
Nicholas County	28	391	7
Todd County	49	685	7
McLean County	41	576	7
Breathitt County	56	799	7
Silver Grove Independent	8	114	7
Owsley County	21	302	7
Lyon County	21	303	7
Campbell County	102	1,504	7
Hopkins County	166	2,471	7

Shortage positions by district, cont.

District	Shortage Positions	All Positions	Percent Shortage Positions
Washington County	39	590	7%
Spencer County	50	761	7
Carter County	114	1,734	7
Williamstown Independent	18	277	6
Bath County	43	668	6
Whitley County	106	1,654	6
Christian County	190	2,974	6
Greenup County	63	1,003	6
Erlanger-Elsmere Independent	47	756	6
Jackson County	50	812	6
Lawrence County	53	869	6
Breckinridge County	48	808	6
Monroe County	40	688	6
Menifee County	24	413	6
Green County	34	593	6
Shelby County	119	2,081	6
Paris Independent	16	280	6
Jessamine County	141	2,483	6
Ballard County	28	493	6
Wolfe County	25	452	6
Lewis County	44	796	6
Elliott County	22	408	5
Corbin Independent	43	804	5
Casey County	43	813	5
Marion County	56	1,055	5
Bourbon County	47	896	5
Pulaski County	137	2,643	5
Martin County	39	758	5
Hardin County	234	4,580	5
Anderson County	61	1,205	5
Bullitt County	193	3,823	5
Caldwell County	32	640	5
Gallatin County	25	506	5
Caverna Independent	14	290	5
Ludlow Independent	14	292	5
Grant County	53	1,116	5
Jackson Independent	6	126	5
Barren County	69	1,465	5

Shortage positions by district, cont.

District	Shortage Positions	All Positions	Percent Shortage Positions
Campbellsville Independent	20	432	5%
Henderson County	103	2,224	5
Mayfield Independent	24	521	5
Mercer County	48	1,045	5
Newport Independent	34	746	5
Grayson County	62	1,386	4
Monticello Independent	13	299	4
Logan County	52	1,202	4
Montgomery County	64	1,475	4
Raceland-Worthington Independent	14	314	4
Fayette County	576	13,421	4
Murray Independent	21	492	4
LaRue County	33	770	4
Johnson County	56	1,321	4
State	9,180	217,091	4
Hancock County	23	534	4
Pendleton County	37	889	4
Berea Independent	15	364	4
Nelson County	59	1,424	4
Ashland Independent	42	1,014	4
Simpson County	37	909	4
Fulton Independent	7	174	4
Leslie County	24	607	4
Metcalfe County	21	532	4
Fleming County	31	789	4
Jefferson County	1,204	30,953	4
Robertson County	6	155	4
Harlan Independent	11	279	4
Livingston County	18	457	4
Graves County	56	1,477	4
Oldham County	133	3,503	4
Calloway County	39	1,031	4
Butler County	25	663	4
Hart County	33	876	4
Owensboro Independent	60	1,585	4
Russell County	39	1,042	4
Madison County	123	3,290	4
Marshall County	59	1,586	4
Clark County	67	1,838	4

Shortage positions by district, cont.			
District	Shortage Positions	All Positions	Percent Shortage Positions
Franklin County	71	1,958	4%
Knox County	64	1,756	4
Scott County	85	2,377	4
Boyd County	46	1,274	4
Trigg County	23	647	4
Letcher County	40	1,130	4
Magoffin County	30	854	4
Lincoln County	49	1,384	4
McCreary County	36	1,053	3
Dawson Springs Independent	8	236	3
Ohio County	43	1,268	3
Elizabethtown Independent	25	745	3
Russell Independent	22	652	3
Meade County	50	1,471	3
Garrard County	29	874	3
Bell County	34	1,074	3
Pike County	93	3,047	3
Clinton County	17	570	3
Hickman County	9	295	3
Burgin Independent	5	164	3
Floyd County	61	2,025	3
Boone County	174	5,821	3
Powell County	25	825	3
Perry County	43	1,460	3
Taylor County	23	811	3
McCracken County	59	2,100	3
Adair County	24	876	3
Fairview Independent	7	256	3
Dayton Independent	9	330	3
Estill County	22	810	3
Hazard Independent	9	332	3
Paducah Independent	28	1,041	3
Mason County	25	948	3
Warren County	110	4,216	3
Morgan County	18	716	3
Kenton County	102	4,074	3
Cumberland County	9	362	2
Edmonson County	16	652	2

Shortage positions by district, cont.

District	Shortage Positions	All Positions	Percent Shortage Positions
Middlesboro Independent	14	593	2%
Boyle County	21	921	2
Harrison County	21	951	2
Clay County	31	1,405	2
Rowan County	23	1,061	2
Bardstown Independent	16	749	2
Muhlenberg County	39	1,871	2
Knott County	16	837	2
Fort Thomas Independent	15	773	2
Woodford County	23	1,217	2
Walton-Verona Independent	8	434	2
Anchorage Independent	3	180	2
Bowling Green Independent	21	1,310	2
Daviess County	57	3,570	2
Laurel County	42	2,670	2
Wayne County	11	769	1
Pikeville Independent	6	424	1
Somerset Independent	7	514	1
Rockcastle County	12	974	1
Science Hill Independent	2	132	1
Glasgow Independent	6	699	1
Lee County	3	357	1
East Bernstadt Independent	1	149	1
Southgate Independent	0	79	0

Note: Shortage positions in this analysis do not include unfilled positions or retired teachers.

Source: Staff analysis of data from the Kentucky Department of Education and Education Professional Standards Board.

Appendix D

Kentucky Statute On Alternative Routes To Certification

KRS 161.048

161.048 Alternative certification program -- Purpose -- Options -- Testing and eligibility requirements -- Salary schedule.

- (1) The General Assembly hereby finds that:
 - (a)
 1. There are persons who have distinguished themselves through a variety of work and educational experiences that could enrich teaching in Kentucky schools;
 2. There are distinguished scholars who wish to become teachers in Kentucky's public schools, but who did not pursue a teacher preparation program;
 3. There are persons who should be recruited to teach in Kentucky's public schools as they have academic majors, strong verbal skills as shown by a verbal ability test, and deep knowledge of content, characteristics that empirical research identifies as important attributes of quality teachers;
 4. There are persons who need to be recruited to teach in Kentucky schools to meet the diverse cultural and educational needs of students; and
 5. There should be alternative procedures to the traditional teacher preparation programs that qualify persons as teachers.
 - (b) There are hereby established alternative certification program options as described in subsections (2) to (9) of this section.
 - (c) It is the intent of the General Assembly that the Educational Professional Standards Board inform scholars, persons with exceptional work experience, and persons with diverse backgrounds who have potential as teachers of these options and assist local boards of education in implementing these options and recruitment of individuals who can enhance the education system in Kentucky.
 - (d) The Education Professional Standards Board shall promulgate administrative regulations establishing standards and procedures for the alternative certification options described in this section.
- (2) Option 1: Certification of a person with exceptional work experience. An individual who has exceptional work experience and has been offered employment in a local school district shall receive a one (1) year provisional teaching certificate with approval by the Education Professional Standards Board of a joint application by the individual and the employing school district under the following conditions:
 - (a) The application contains documentation of all education and work experience;
 - (b) The candidate has documented ten (10) years of exceptional work experience in the area in which certification is being sought;

- (c) The candidate possesses:
 - 1. a. A minimum of a bachelor's degree, with a cumulative grade point average of two and five-tenths (2.5) on a four (4) point scale or a grade point average of three (3.0) on a four (4) point scale on the last sixty (60) hours of credit completed, including undergraduate and graduate coursework from a nationally or regionally accredited postsecondary institution; or
 - b. A graduate degree with a cumulative grade point average of two and five-tenths (2.5) on a four (4) point scale or a grade point average of three (3.0) on a four (4) point scale on the last sixty (60) hours of credit completed, including undergraduate and graduate coursework from a nationally or regionally accredited postsecondary institution; and
 - 2. An academic major or a passing score on the academic content assessment designated by the Education Professional Standards Board; and
 - (d) The candidate shall participate in the teacher internship program under subsections (5), (6), (7), and (8) of KRS 161.030. After successful completion of the internship, the candidate shall receive a regular professional certificate and shall be subject to certificate renewal requirements the same as any other teacher with a regular professional certificate.
- (3) Option 2: Certification through a local district training program. A local district or group of districts may seek approval for a training program. The state-approved local district training program is an alternative to the college teacher preparation program as a means of acquiring teacher certification for a teacher at any grade level. The training program may be offered for all teaching certificates approved by Education Professional Standards Board, including interdisciplinary early childhood education, except for specific certificates for teachers of exceptional children. To participate in a state-approved local district alternative training program, the candidate shall:
- (a) Possess a bachelor's degree with a grade point average of two and five tenths (2.5) on a four (4) point scale or, upon approval by the Education Professional Standards Board, at least a grade point average of two (2) on a four (4) point scale if the candidate has exceptional life experience related to teaching and has completed the bachelor's degree at least five (5) years prior to submitting an application to the program.
 - (b) Pass written tests designated by the Education Professional Standards Board for content knowledge in the specific teaching field of the applicant with minimum scores in each test as set by the Education Professional Standards Board. To be eligible to take a subject field test, the applicant shall have completed a thirty (30) hour major in the academic content area or five (5) years of experience in the academic content area as approved by the Education Professional Standards Board.

- (c) Have been offered employment in a school district which has a training program approved by the Education Professional Standards Board.
 - (d) Upon meeting the participation requirements as established in this subsection, the candidate shall be issued a one (1) year provisional certificate by the Education Professional Standards Board. The regular provisional certificate shall be issued upon satisfactory completion of the program and the teacher testing internship program pursuant to KRS 161.030.
 - (e) The Education Professional Standards Board may reject the application of any candidate who is judged as not meeting academic requirements comparable to those for students enrolled in Kentucky teacher preparation programs.
- (4) Option 3: Certification of a professional from a postsecondary institution: A candidate who possesses the following qualifications may receive alternative certification for teaching at any level:
- (a) A master's degree or doctoral degree in the academic content area for which certification is sought;
 - (b) A minimum of five (5) years of full-time teaching experience, or its equivalent, in the academic content area for which certification is sought in a regionally or nationally accredited institution of higher education; and
 - (c) Successful completion of the teacher internship requirement imposed under KRS 161.030.
- (5) Option 4: Certification of an adjunct instructor. A person who has expertise in areas such as art, music, foreign language, drama, science, and other specialty areas may be employed as an adjunct instructor in a part-time position by a local board of education under KRS 161.046. An individual certified as an adjunct instructor shall not be deemed "highly qualified" under the provisions of the federal No Child Left Behind Act of 2001, 20 U.S.C. secs. 6301 et seq.
- (6) Option 5: Certification of a veteran of the Armed Forces. The Education Professional Standards Board shall issue a statement of eligibility, valid for five (5) years, to a veteran for teaching at the elementary, secondary, and secondary vocational education levels with the following qualifications:
- (a)
 - 1. Discharged or released from active duty under honorable conditions after six (6) or more years of continuous active duty immediately before the discharge or release; or
 - 2. Completed a total of at least ten (10) years of active duty service, ten (10) years of service officially credited toward armed services retirement, or ten (10) years' combination of such service;
 - (b) At least a bachelor's degree in the content area or closely related area for which certification is sought, issued by a regionally or nationally accredited institution of higher education;
 - (c) A grade point average of two and five-tenths (2.5) on a four (4) point scale for a bachelor's degree or an advanced degree; and
 - (d) A passing score on the written exit assessment examination designated by the Education Professional Standards Board for content knowledge.

Upon an offer of employment by a school district, the eligible veteran shall receive a one (1) year provisional teaching certificate with approval by the Education Professional Standards Board of a joint application by the veteran and the employing school district. During this year, the veteran shall participate in the teacher internship program under subsections (5), (6), (7), and (8) of KRS 161.030. Upon successful completion of the internship program, the veteran shall receive a regular professional certificate.

- (7) Option 6: University alternative program. With approval of the Education Professional Standards Board, a university may provide an alternative program that enrolls students in a postbaccalaureate teacher preparation program concurrently with employment as a teacher in a local school district. A student in the alternative program shall be granted a temporary provisional certificate and shall be a candidate in the Kentucky teacher internship program, notwithstanding provisions of KRS 161.030. A student may not participate in the internship program until the student has successfully completed the assessments required by the board. The temporary provisional certificate shall be valid for a maximum of one (1) year, and may be renewed two (2) additional years, and shall be contingent upon the candidate's continued enrollment in the preparation program and compliance with all requirements established by the board. A professional certificate shall be issued upon the teacher candidate's successful completion of the program, the internship requirements, and all assessments required by the board.
- (8) Option 7: Certification of a person in a field other than education to teach in elementary, middle, or secondary programs. This option shall not be limited to teaching in shortage areas.
 - (a) An individual certified under provisions of this subsection shall be issued a one (1) year temporary provisional teaching certificate, renewable for a maximum of two (2) additional years with approval of the Education Professional Standards Board provided that the candidate:
 1. Possesses a bachelor's degree with a declared academic major in the area in which certification is sought and a cumulative grade point average of 3.0 on a 4.0 scale, or a professional or graduate degree in a field related to the area in which certification is sought;
 2. Has a minimum score of five hundred (500) on the verbal section and a minimum score of four (4) on the analytical writing section of the Graduate Record Examination (GRE). In addition, teachers of mathematics and physical and biological sciences shall have a minimum score of four hundred fifty (450) on the quantitative section of the GRE. A candidate who has a professional degree shall be exempt from the requirements of this subparagraph; and
 3. Passes written tests designated by the Education Professional Standards Board for content knowledge in the specific teaching field of the applicant with minimum scores in each test as set by the board.

- (b) Prior to receiving the temporary provisional certificate or during the first year of the certificate, the teacher shall complete the following:
 - 1. For elementary teaching, the individual shall successfully complete the equivalent of a two hundred forty (240) hour institute, based on six (6) hour days for eight (8) weeks. The providers and the content of the institute shall be approved by the Education Professional Standards Board. The content shall include research-based teaching strategies in reading and math, research on child and adolescent growth, knowledge of individual differences, including teaching exceptional children, and methods of classroom management.
 - 2. For middle and secondary teaching, the individual shall successfully complete the equivalent of a one hundred eighty (180) hour institute, based on six (6) hour days for six (6) weeks. The providers and the content of the institute shall be approved by the Education Professional Standards Board and shall include research-based teaching strategies, research on child and adolescent growth, knowledge of individual differences, including teaching exceptional children, and methods of classroom management.
- (c) The candidate shall participate in the teacher internship program under subsections (5), (6), (7), and (8) of KRS 161.030. After successful completion of the internship program, the candidate shall receive a regular professional certificate.
- (9) Option 8: Certification of a Teach for America participant to teach in elementary, middle, or high schools. Nothing in this subsection shall conflict with the participation criteria of the Teach for America program.
 - (a) An individual certified under this subsection shall be issued a one (1) year temporary provisional teaching certificate if the candidate:
 - 1. Has an offer of employment from a local school district;
 - 2. Possesses a bachelor's degree;
 - 3. Successfully completes the summer training institute and ongoing professional development required by Teach for America, including instruction in goal-oriented, standards-based instruction, diagnosing and assessing students, lesson planning and instructional delivery, classroom management, maximizing learning for diverse students, and teaching methodologies; and
 - 4. Successfully passes written tests designated by the Education Professional Standards Board for content knowledge in the specific teaching field of the candidate with minimum scores in each test as set by the board.
 - (b) The temporary provisional certificate granted under paragraph (a) of this subsection may be renewed two (2) times with a recommendation of the superintendent and approval of the Education Professional Standards Board.

- (c) A Teach for America participant who is approved for a second renewal of his or her temporary provisional certificate under paragraph (b) of this subsection may participate in the internship program under KRS 161.030.
 - (d) A Teach for America participant shall be issued a professional certificate upon the participant's successful completion of the internship program and assessments relating to teaching of subject matter required by the Education Professional Standards Board under KRS 161.030.
 - (e) Notwithstanding any statute or administrative regulation to the contrary, a teacher certified under this subsection shall have ten (10) years from the date that the teacher successfully completed the internship program to complete a master's degree or fifth year program, or the equivalent as specified by the Education Professional Standards Board in administrative regulation.
 - (f) Alternative certification under this subsection shall be considered a pilot program and shall be an option from July 15, 2010, until the federal Race to the Top funding program under Sections 14005 and 14006 of the American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, is completed, except that the Education Professional Standards Board may promulgate administrative regulations in accordance with KRS Chapter 13A to make this a permanent option.
- (10) A public school teacher certified under subsections (2) to (9) of this section shall be placed on the local district salary schedule for the rank corresponding to the degree held by the teacher.
 - (11) Veterans who were discharged or released from active duty under honorable conditions after six (6) or more years of continuous active duty immediately before the discharge or release, and who have at least four (4) years of occupational experience in the area in which they seek certification as a vocational industrial education teacher, shall apply for certification under and meet the requirements of the administrative regulations promulgated by the Education Professional Standards Board.
 - (12) Subsections (1) to (3) of this section notwithstanding, a candidate who possesses the following qualifications may receive certification for teaching programs for exceptional students:
 - (a) An out-of-state license to teach exceptional students;
 - (b) A bachelor's or master's degree in the certification area or closely related area for which certification is sought; and
 - (c) Successful completion of the teacher internship requirement required under KRS 161.030.
 - (13) A teacher who is fully certified in Kentucky and who is seeking an additional certification is not required to repeat the Kentucky teacher internship program.
 - (14) Under KRS 161.030(5), a candidate for alternative certification may serve his or her internship in a nonpublic school.

Effective: July 15, 2010

History: Amended 2010 Ky. Acts ch. 79, sec. 1, effective July 15, 2010. – Amended 2008 Ky. Acts ch. 177, sec. 1, effective July 15, 2008. -- Amended 2005 Ky. Acts ch. 111, sec. 2, effective June 20, 2005. -- Amended 2004 Ky. Acts ch. 117, sec. 3, effective July 13, 2004. -- Amended 2000 Ky. Acts ch. 161, sec. 1, effective July 14, 2000. -- Amended 1998 Ky. Acts ch. 514, sec. 8, effective July 15, 1998; and ch. 589, sec. 1, effective July 15, 1998. -- Amended 1996 Ky. Acts ch. 137, sec. 1, effective July 15, 1996; and ch. 343, sec. 6, effective July 15, 1996. -- Created 1990 Ky. Acts ch. 476, Pt. II, sec. 58, effective July 13, 1990.

Appendix E

Funds Appropriated For National Board For Professional Teaching Standards Salary Supplements

Districts are reimbursed for the cost of this salary supplement through funds appropriated in the Support Education Excellent in Kentucky fund. The table shows the funds appropriated by the General Assembly to pay salary stipends for NBPTS teachers per year compared to the cost to districts of paying salary supplements. In 2003, more funds were appropriated than were needed to cover salary supplements. Funds appropriated have not kept pace with the increasing numbers of NBPTS teachers working each year.

Funds Appropriated For National Board For Professional Teaching Standards Salary Supplements Compared With Cost To Districts 2003-2012

Fiscal Year	Funds Appropriated	NBPTS Teachers Working	School Year	Cost To Districts	Difference Between Funds Appropriated And Cost To Districts
2012	\$ 2,750,000	1,735	2011	3,495,033.14	\$ (745,033.14)
2011	2,750,000	1,481	2010	2,987,580.12	(237,580.12)
2010	2,750,000	1,379	2009	2,754,992.67	(4,992.67)
2009	2,750,000	1,227	2008	2,454,000.00	296,000.00
2008	2,504,000	1,016	2007	2,031,000.00	473,000.00
2007	2,104,000	819	2006	1,858,000.00	246,000.00
2006	1,858,000	686	2005	1,374,977.00	483,023.00
2005	1,458,000	498	2004	1,029,080.00	428,920.00
2004	600,000	255	2003	510,000.00	90,000.00
2003	600,000	129	2002	256,692.00	343,308.00

Note: In some cases districts are not required to pay the full \$2,000 stipend. This can happen when NBPTS-certified teachers do not work full time or have not worked a full year.

Source: Ritter.

Appendix F

Teacher Employment Patterns By Region And Select Districts

Average Annual Teacher Mobility And Supply Data By Area Development District 2008-2012

Area Development District	Teacher Mobility					Teacher Supply	
	Stayed In School	Left Teaching In Kentucky	Retired	Moved School In District	Moved District	New Teachers	Returned To Teaching Or Moved From Other State
Barren River	84.0%	4.7%	1.8%	4.4%	2.8%	5.9%	2.9%
Big Sandy*	85.8	3.8	2.4	7.4	1.1	3.7	2.0
Bluegrass	83.4	6.2	2.0	4.4	2.9	5.9	3.5
Buffalo Trace	88.6	4.3	1.9	2.7	2.5	4.0	2.5
Cumberland Valley	88.7	3.0	2.1	4.8	1.1	3.6	1.9
FIVCO	87.8	4.1	2.5	3.5	2.0	4.0	2.7
Gateway	84.3	4.9	2.2	5.4	2.3	5.1	2.6
Green River	84.5	4.9	2.3	4.4	2.5	5.2	3.2
Kentuckiana	82.2	5.8	1.8	7.5	1.0	5.7	3.3
Kentucky River	87.8	3.4	2.2	4.7	1.9	4.0	1.9
Lake Cumberland	88.8	3.4	1.7	4.2	1.7	3.5	1.9
Lincoln Trail	86.4	4.5	1.9	3.5	2.4	5.0	3.0
Northern Kentucky	83.7	5.6	2.0	3.9	2.8	4.9	4.4
Pennyrile	82.3	6.0	2.6	5.4	2.8	5.7	4.1
Purchase	86.3	4.6	2.1	3.5	2.4	4.9	2.8

* Data in this region reflect movement of teachers from some schools that were closed to others in the same district.
Source: Staff analysis of Kentucky Department of Education data.

**Average Percent Of Students By School Who Are
Minority Students Or Students Living In Poverty
By Quartile Of School Attrition
Jefferson County
2008-2012**

Attrition Quartile	Average Attrition in Quartile	Percent Students in Poverty	Percent Minority Students	Percent Teachers <3 years' Experience
(high) 1	25	79	56	27
2	17	74	52	19
3	13	56	43	13
(low) 4	9	52	43	9

**Average Percent Of Students By School Who Are
Minority Students Or Students Living In Poverty
By Quartile Of School Attrition
Fayette County
2008-2012**

Attrition Quartile	Average Attrition in Quartile	Percent Students in Poverty	Percent Minority Students	Percent Teachers <3 years' Experience
(high) 1	29	61	71	30
2	22	47	56	23
3	16	33	37	16
(low) 4	11	30	32	12