

# Investigating the Relationship between Adherence to Connecticut's Teacher Education and Mentoring Program and Teacher Retention

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# Investigating the Relationship between Adherence to Connecticut’s Teacher Education and Mentoring Program Requirements and Teacher Retention

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Connecticut is one of many states that implements an induction program for beginning teachers to mitigate high turnover and lower efficacy among early-career teachers. The state’s Teacher Education and Mentoring (TEAM) Program requires beginning teachers to complete five instructional modules, have a certain number of contact hours with a mentor, and submit four reflection papers. This study was conducted to explore the relationship between adherence to TEAM Program requirements and the outcome of interest—teacher retention. The results suggest that teachers who completed more of the program requirements were more likely to stay in the same district and in the Connecticut public school system. Adherence varied across program requirements; completion rates were highest for the requirements related to module completion and lowest for the requirements related to contact hours with mentors. For the program requirements related to module completion and teacher–mentor contact hours, adherence was higher for teachers in the state’s 30 lowest performing districts than for teachers in higher performing districts.

## Why this study?

Early-career teachers tend to leave the profession at a higher rate (Borman & Dowling, 2008; Guarino et al., 2006) and demonstrate lower efficacy in the classroom (Hanushek et al., 2005; Ladd & Sorenson, 2015; Papay & Kraft, 2015) than more experienced teachers. To counter these challenges, school districts and states often implement formal teacher induction programs to support beginning teachers. Such programs typically pair a beginning teacher with an experienced teacher or mentor (Smith & Ingersoll, 2004) and provide support for the beginning teachers.

Connecticut is one of 29 states that require beginning teachers to complete an induction program (Goldrick, 2016; see box 1 for definitions of key terms). The state’s two-year Teacher Education and Mentoring (TEAM) Program includes five instructional modules that help beginning teachers align their instruction with the state’s standards for educators—the Common Core of Teaching (Connecticut State Department of Education, 2010). The modules cover classroom environment and student engagement and commitment to learning, planning for active learning, instruction for active learning, assessment for learning, and professional responsibilities. The program also provides beginning teachers with a specially trained mentor, who may be within or outside the teacher’s school and content area (see box 2 for details of the program). The first cohort of teachers participated in the program in fall 2010.

The Connecticut State Department of Education wants to understand the extent to which all of its districts are implementing the TEAM Program, as required by law. That is, the department wants to know whether districts are implementing those requirements with fidelity. A program is implemented with fidelity if it is delivered as planned (Durlak & DuPre, 2008; Nelson et al., 2010) or if what was enacted is consistent with what was intended (Century et al., 2010). Fidelity studies typically explore one or more of the following dimensions of implementation: adherence, dosage, quality of program delivery, participant responsiveness, and program differentiation (Dane & Schneider, 1998). This study focuses on the first of those dimensions: individual teachers’ adherence to the program requirements.

For additional information, including a literature review, technical methods, and supplementary tables, access the report appendixes at <https://go.usa.gov/xGKbt>.

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## Box 1. Key terms

**Adherence score.** The number of Teacher Education and Mentoring (TEAM) Program requirements to which a teacher adhered, divided by the total number of program requirements. The adherence score for year 1 includes three requirements, and the adherence score for the full program includes six requirements (see table in box 2). The adherence score for a given teacher ranges from 0, meaning the teacher completed none of the requirements, to 1, meaning the teacher completed all the requirements (see definition of *program requirement*).

**Alliance districts.** The 30 districts with the lowest academic performance among the 170 districts in Connecticut. The 10 lowest performing among them are called Opportunity districts, and the remaining 20 districts are called Priority districts (see below).

**Beginning teacher.** A teacher with an initial educator certificate. Beginning teachers are eligible for the provisional educator certificate after completing the two-year TEAM Program, at which point they are no longer considered a beginning teacher. Beginning teachers are either category 1 or category 2 (see below), depending on their certification area.

**Category 1 teacher.** Teachers certified in elementary education (excluding birth–age 3 programs), middle school, English language arts, health, math, science, social studies, special education, bilingual education, music, physical education, art, world languages, remedial reading or remedial language arts, or English learner education. Category 1 teachers are required to complete all five modules of the TEAM Program and were included in this report.

**Category 2 Teacher.** Teachers certified and teaching in areas not specified in the category 1 definition, such as business education and agriculture. These teachers complete a one-year TEAM Program consisting of two modules. Category 2 teachers are not included in the analyses in this report (see box 3 for more information).

**Combined-grade school.** A school whose grade span encompasses preschool, elementary, and secondary grades.

**District performance category.** A state classification for districts based on the academic performance of their schools (see definition of *Alliance districts*).

**Initial educator certificate.** The first certificate in the three-tier teacher certification process in Connecticut. An initial educator certificate is valid for three calendar years.

**Interim educator certificate.** A certificate issued at the initial or provisional level in Connecticut when a teacher has specific course deficiencies, according to current certification regulations. An interim educator certificate is valid for three calendar years.

**Multilevel logistic regression.** Logistic regression is an analysis method used to study the association between predictor variables, such as adherence to program requirements, and a binary outcome variable, such as teacher retention (which is a binary variable because a teacher either stays in or leaves the district or the state). Multilevel logistic regression is a type of logistic regression that is used when data are clustered. In this study, clustering of data exists because teachers are nested within districts.

**Opportunity districts.** The 10 districts with the lowest academic performance among the 170 districts in Connecticut. These districts are included in the larger category of Alliance districts.

**Preschool/elementary school.** A school with a grade span of preschool through grade 5.

**Priority districts.** The 20 districts with the 11th–30th lowest academic performance among the 170 districts in Connecticut. These districts are included in the larger category of Alliance districts.

**Program requirements.** The eight requirements for category 1 beginning teachers in the TEAM Program legislation (see box 2). As noted in box 2, the legislative requirements were modified for this report to address data issues. Three requirements were used for year-1 adherence—20 contact hours in year 1, completion of two modules in year 1, and completion of two reflection papers in year 1—and six requirements were used for full program adherence—an average of 10 contact hours each in modules 1–4, completion of two modules in year 1, completion of five modules in two years, completion of all five modules in three years, completion of two reflection papers in year 1, and completion of four reflection papers in year 2.

**Proportion of teachers completing a requirement.** The total number of teachers who completed a requirement divided by the total number of teachers in the TEAM Program with valid data on whether they completed that requirement.

**Provisional educator certificate.** The second certificate in the three-tier teacher certification process in Connecticut. A provisional educator certificate is valid for eight years. The third and final certificate is called a Professional certificate.

**Retention.** Whether a teacher stayed in a teaching position in the same district (in-district retention) or in the Connecticut public school system (in-state retention) after one or more years. For example, teachers who were teaching in the same district or in the Connecticut public school system in their fourth year were considered retained after three years.

**School Title I status.** Whether a school receives federal funding under Title I legislation, which provides schools with large concentrations of low-income students with supplemental funds to assist in meeting students’ education goals.

**Secondary school.** A school with a grade span of grades 6–12.

## Box 2. About Connecticut’s Teacher Education and Mentoring Program

Connecticut’s Teacher Education and Mentoring (TEAM) Program is a legislatively mandated teacher induction program for all beginning teachers<sup>1</sup> teaching under an initial educator certificate, an interim initial educator certificate, or a 90-day certificate in a subject area applicable to the program, as long as the teacher will remain in the same position for the entire year.

Each district develops and implements its own TEAM Program. State legislation mandates that each program incorporate eight requirements across four broad areas: the assignment of mentors, teacher–mentor engagement, teachers’ completion of five instructional modules, and assessment of teacher learning via reflection papers. Each requirement is described in more detail in the table below. Districts can add other requirements, such as a longer orientation for beginning teachers, or additional criteria for mentors based on experience or performance. This study focuses on six of the eight requirements because of data availability and because one of the program requirements was conflated with the length of time a teacher was teaching.

### Connecticut’s Teacher Education and Mentoring Program requirements

Program requirement	Description from legislation	Program requirement used to calculate adherence score for the first year of the program	Program requirement used to calculate adherence score for the entire duration of the program
<b>Mentor assignment</b>			
Assignment of a mentor within 30 days <sup>a</sup>	Districts are required to assign a mentor to beginning teachers within 30 days of their hiring.		
<b>Teacher–mentor contact hours</b>			
Total of 50 contact hours during the program <sup>b</sup>	Beginning teachers are required to have 50 documented contact hours with a mentor during the program. During contact hours mentors can provide general support or focus on a specific module. Teachers are primarily responsible for initiating the contact hours, and mentors are responsible for making themselves available to meet and documenting the contact hours.		
Total of 10 contact hours per module <sup>c</sup>	Beginning teachers are required to have approximately 10 contact hours with a mentor per module for modules 1–4. Teachers are primarily responsible for initiating the contact hours, and mentors are responsible for making themselves available to meet and for documenting the contact hours.	Total of 20 contact hours in the first year	Average of 10 contact hours for modules 1–4

(continued)

Program requirement	Description from legislation	Program requirement used to calculate adherence score for the first year of the program	Program requirement used to calculate adherence score for the entire duration of the program
<b>Module completion</b>			
Two modules in the first year	Beginning teachers are required to complete two modules in the first year of the program.	Two modules in the first year	Two modules in the first year
Five modules in two years	Beginning teachers are required to complete five modules by the end of the second year of the program.		Five modules in two years
All five modules in three years <sup>d</sup>	Beginning teachers are required to complete all five modules		All five modules in three years
<b>Reflection paper submission</b>			
Two reflection papers in the first year	Beginning teachers are required to submit two reflection papers in the first year of the program.	Two reflection papers in the first year	Two reflection papers in the first year
All four reflection papers in two years	Beginning teachers are required to submit all four reflection papers by the end of the second year of the program.		All four reflection papers in two years

a. Not included in the study's main or supporting analysis because of data quality issues (see box 3 and appendix B).

b. Not included in the study's main or supporting analysis because it was conflated with the length of time a teacher was teaching (see box 3 and appendix B).

c. The study's analysis used total of 20 contact hours for the first year and average of 10 contact hours per module for modules 1–4 for the second year instead of this requirement (see box 3 and appendix B).

d. The requirement for completing all five modules can be met during the third year if teachers had extenuating circumstances.

Source: Connecticut State Department of Education, based on Section 10–145 of the Connecticut General Statutes passed in October 2009.

Districts assign each beginning teacher a mentor who has at least a provisional level education certificate, has completed the TEAM Program Initial Support Teacher Training, and has taught for at least three years, including one year in the district in which he or she is mentoring. Teachers, in conjunction with their mentor, articulate professional growth goals and develop a plan of activities to address the growth areas. The plan is referred to as a Professional Growth Action Plan and reflects the teacher's self-assessment using the state's Common Core of Teaching Performance Profiles. The plan identifies a foundational skill and competency indicator to focus on from the state's teaching standards, called the Common Core of Teaching. The plan describes what the beginning teacher wants to learn in order to improve teaching practice and describes the anticipated positive impact on student performance. The plan also includes the anticipated timeline for completion, which is recommended as 8–10 weeks.

Instructional modules designed to build new teacher knowledge and develop instructional skills are a core component of the TEAM program. They include:

- Module 1: Classroom environment, student engagement, and commitment to learning.
- Module 2: Planning for active learning.
- Module 3: Instruction for active learning.
- Module 4: Assessment for learning.
- Module 5: Professional responsibilities.

For each module, teachers write Professional Growth Action Plans that focus on the content and teaching standards and indicators covered in each module. For example, for module 1, teachers articulate their desired learning goals related to classroom environment, student engagement, and commitment to learning. They also articulate the resources needed to engage in the activities that they will undertake to improve their practice. Teachers are required to document, describe, and reflect on the process of learning and implementing what was learned in the classroom in a reflection paper. Trained reviewers read the reflection papers and determine whether the teachers have achieved the goals for the module. Teachers who do not achieve the goals receive feedback and must revise and resubmit their paper. Teachers who achieve the goals are considered to have completed the module. There is no reflection paper for module 5. Instead, teachers are required to attend a district-facilitated workshop focusing on case studies that illuminate potential ethical and professional dilemmas for teachers.

Responsibility for completing the program requirements rests primarily with teachers. Districts ensure that teachers are supported through the process by providing a mentor, monitoring progress through mentor logs, and intervening when warranted.

The Connecticut State Department of Education reminds teachers of their responsibility to complete the program and the deadline by which they must do so.

Beginning teachers are expected to complete two modules in the first year of the program and all five modules by the end of the second year. An additional year is permitted in extenuating circumstances, such as medical leave. Teachers can complete the modules in any order, but most complete modules 1–4 sequentially, with module 5 sometimes completed out of sequence. Teachers who complete all five modules are eligible for a provisional educator certificate, which is the second-level certificate of Connecticut’s three-tier continuum that allows them to teach in the state for eight more years. Teachers who do not complete all five modules within two years (or within three years, with extenuating circumstances) lose their certification when their initial certificate expires. To renew their initial certificate, these teachers must fulfill additional requirements.<sup>2</sup>

#### Notes

1. Beginning teachers include both category 1 and category 2 teachers (see box 1). Because category 2 teachers complete a one-year TEAM Program consisting of two modules, they were not included in the analyses for this report. Henceforth, beginning teachers refers to category 1 teachers.
  2. The requirements include completing a state-approved course, engaging in a long-term substitute position, completing 250 volunteer hours, writing a structured reflection paper, and completing an interview with Connecticut State Department of Education staff. In addition, the teacher must meet standards on any new or regenerated tests in the endorsement area that were not required at the time of the original certificate.
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The Connecticut State Department of Education has a particular interest in understanding the implementation of the TEAM Program in the state’s lowest performing districts. Alliance districts are the 30 districts in Connecticut with the lowest performance. Alliance districts are further categorized into Opportunity districts, the 10 lowest performing districts, and Priority districts, the remaining 20 lowest performing districts. Alliance districts are also among the state’s poorest districts, with high rates of students experiencing poverty.

Although each of the state’s districts stands to benefit from effective implementation of the TEAM Program requirements, Alliance districts may have the most to gain. Teacher turnover is notably higher in Alliance districts than in higher performing districts. Prior research in Connecticut has shown that vacancy rates for teaching positions are higher in lower performing districts (13 percent) than in higher performing ones (7 percent; Connecticut State Department of Education, 2015b). Prior research has also shown that among teachers with fewer than five years of experience, those who worked in a high-poverty school were more likely to move to another school than those who worked in a low-poverty school (28 percent compared with 14 percent; Connecticut State Department of Education, 2015a).

## Research questions

This study addressed three research questions about adherence to the TEAM Program requirements and teacher retention between the 2012/13 and 2017/18 school years:

1. Was there a relationship between adherence to the requirements of the TEAM Program and in-district and in-state retention of teachers after one year of teaching or after three years?
2. To what extent did beginning teachers in the Connecticut public school system complete the requirements of the TEAM Program?
3. Did adherence to the requirements of the TEAM Program vary by school grade span, school Title I status, or district performance category?

The study used descriptive statistics and regression analysis to examine adherence to the program requirements and its relationship with teacher retention for 7,708 beginning teachers who entered the program between 2012/13 and 2015/16 (see box 3 for a summary of the data sources, sample, and methods and appendix B for more details). Although adherence was a teacher-level variable, mentors, district staff, and the Connecticut State Department of Education also share responsibility for ensuring teachers’ adherence to the program requirements.

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### Box 3. Data sources, sample, and methods

**Data sources.** The study used data from two databases from the Connecticut State Department of Education’s Talent Office: the Employment/Assignment database and the Teacher Education and Mentoring (TEAM) Program implementation database. The Employment/Assignment database contains information about teachers’ employment and placement. The TEAM Program implementation database contains information about the dates of mentoring sessions and about beginning teachers’ progress through the program’s five modules. Data from these databases were combined with publicly available data on Connecticut school and district characteristics, including school grade span (elementary, secondary, or combined grades), school Title I status, and district performance category (non–Alliance, Alliance, Opportunity, or Priority).

**Sample.** The sample consisted of 7,708 teachers from four cohorts of beginning teachers in Connecticut’s 170 districts who entered the TEAM Program between the 2012/13 and 2015/16 school years. Because all teachers who participated in the TEAM Program were automatically entered into the TEAM database, the sample consisted of the entire population of teachers who entered the program during the aforementioned time period.

**Methodology.** The study team created a variable for each of the program requirements included in the analysis: the number of contact hours in the first year (for the first-year adherence score only); the number of contact hours per module; the numbers of modules completed in the first year, in the first two years, and in three years; and the number of reflection papers submitted in the first year and in the first two years. The study team then assigned teachers a score of 1 if they completed a requirement outlined in the TEAM Program legislation and a score of 0 if they did not. The adherence score for the first year was calculated by summing the scores for the three year-1 requirements and dividing by three. The adherence score for the full program was calculated by summing the scores for all six requirements and dividing by six.

Approximately 20 percent of teachers had missing data on the number of contact hours for one or more modules. Consequently, the average contact hours per module and contact hours in the first year for individual teachers were calculated using only the modules for which the teacher had data (see appendix B for a nonresponse bias analysis comparing teachers with complete contact hours data and teachers with missing contact hours data for some modules).

Aside from calculating the adherence score for individual teachers, the study team also calculated the proportion of teachers completing each program requirement. In addition to calculating this proportion for all teachers, the study team also calculated this proportion disaggregated by the characteristics of school or district: school grade span, school Title I status, and district performance category of initial teaching assignment.

For retention, the team calculated the proportion of teachers who stayed in the same district and the proportion who stayed in the Connecticut public school system. These calculations were made after one year and after three years.

Multilevel logistic regression was used to examine the relationship between program adherence and teacher retention after one year of teaching and after three years. For the analysis of the relationship with one-year retention, the study team used the adherence score calculated from only the three year-1 requirements. For the analysis of the relationship with three-year retention, the study team used the adherence score calculated from all six requirements. Both in-district retention and in-state retention were examined. The predictor variable was the adherence score of the teacher. To see whether the strength of the relationship between adherence and retention differed depending on the performance level of the district, the district performance category of the teacher’s original district of employment was also included as a moderator variable.

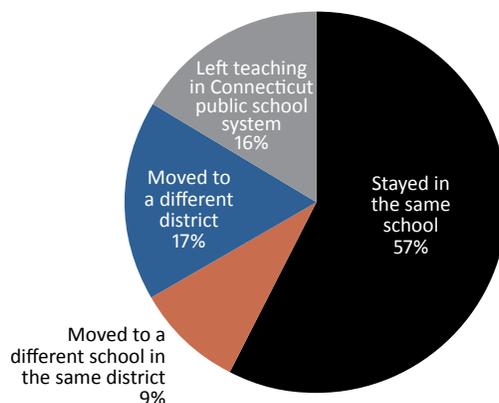
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## Findings

### *The majority of teachers who participated in Connecticut’s Teacher Education and Mentoring Program were teaching in the same school after three years*

Approximately 57 percent of teachers who participated in the TEAM Program were teaching in the same school after three years, 9 percent were teaching in a different school in the same district, 17 percent were teaching in a different district, and 17 percent were no longer teaching in the Connecticut public school system (figure 1; see also table C1 in appendix C).

**Figure 1. The majority of beginning teachers in Connecticut’s Teacher Education and Mentoring Program were teaching in the same school after three years, 2012/13–2017/18**



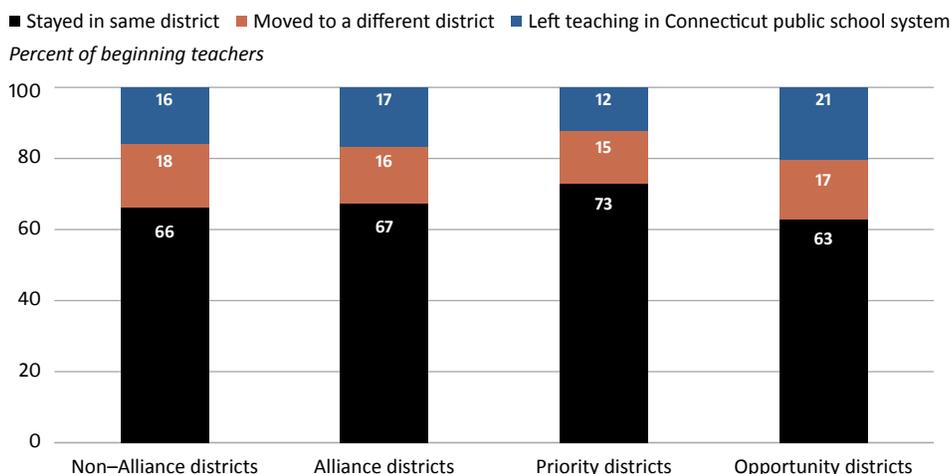
Note: Percentages do not sum to 100 percent because of rounding. The sample size is 6,121; it excludes the 2015/16 cohort, for which three-year retention data were not yet available.

Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

**Teacher retention was lower for teachers in Opportunity districts than for teachers in Priority and non–Alliance districts**

Alliance districts are the 30 districts with the lowest academic performance in Connecticut. Among them, the 10 lowest performing districts are categorized as Opportunity districts, and the remaining 20 districts are categorized as Priority districts. In-district and in-state retention was lowest for teachers in Opportunity districts after one year of teaching and after three years. For example, after three years, 80 percent of teachers in Opportunity districts were still teaching in the Connecticut public school system compared with 88 percent of teachers in Priority districts and 84 percent of teachers in non–Alliance districts (figure 2; see also tables C2 and C3 in appendix C).

**Figure 2. The percentage of beginning teachers in Connecticut’s Teacher Education and Mentoring Program who were teaching in the same district after three years and the percentage who were teaching in the Connecticut public school system after three years were lower in Opportunity districts than in Priority and non–Alliance districts, 2012/13–2017/18**



Note: Alliance districts are the 30 districts with the lowest academic performance among the 170 districts in Connecticut. The 10 lowest performing among them are called Opportunity districts, and the remaining 20 districts are called Priority districts. The sample excludes the 2015/16 cohort, for which three-year retention data were not yet available.

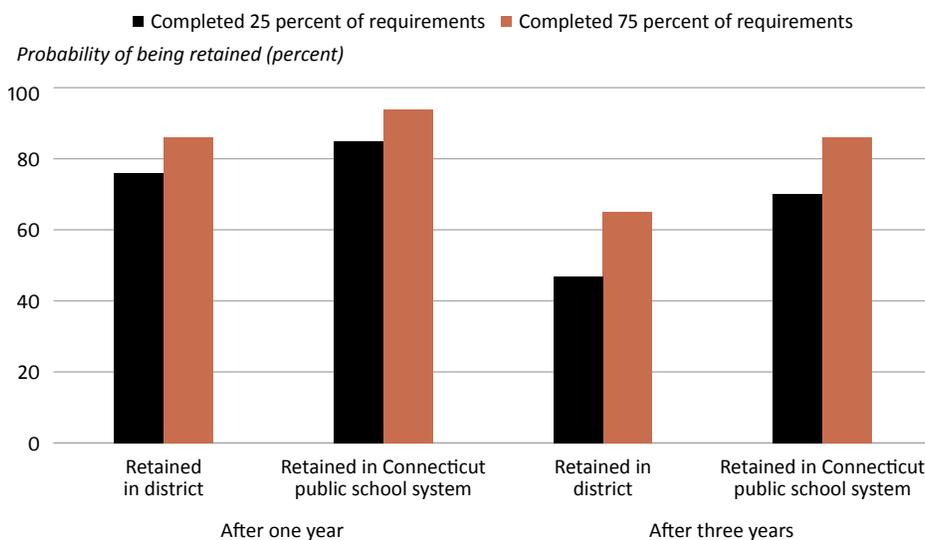
Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

**Program adherence was positively associated with teacher retention, including in the 10 lowest performing districts in the state**

There was a significant and positive relationship between the percentage of requirements that each teacher completed and the probability of the teacher’s retention both in-district and in-state after one year of teaching and after three years. The probability of a teacher being in the same district after one year increased from 76 percent for a teacher who completed 25 percent of the requirements to 82 percent for a teacher who completed 50 percent of the requirements to 86 percent for a teacher who completed 75 percent of the requirements (figure 3; see tables C4 and C6 in appendix C<sup>1</sup>). The probability of a teacher being in the same district after three years under those three scenarios increased from 47 percent to 56 percent to 65 percent. The probability of a teacher being in the Connecticut public school system after one year increased from 85 percent for a teacher who completed 25 percent of the requirements to 90 percent for a teacher who completed 50 percent of the requirements to 94 percent for a teacher who completed 75 percent of the requirements (see tables C5 and table C7 in appendix C<sup>2</sup>). The probability of a teacher being in the Connecticut public school system after three years under those three scenarios increased from 70 percent to 79 percent to 86 percent.

*The positive relationship between a teacher’s TEAM Program adherence and the probability of the teacher’s retention was also found in Opportunity districts.* Even though Opportunity districts had lower teacher retention than non-Opportunity districts did, the probability of in-district or in-state retention was higher for teachers in Opportunity districts who completed 75 percent of the requirements than for teachers in those districts who completed 25 percent of the requirements (figures 4 and 5; see also tables C6 and C7 in appendix C).

**Figure 3. Teachers who completed more of the requirements of Connecticut’s Teacher Education and Mentoring Program were more likely to stay in the same district and in the Connecticut public school system after one year of teaching and after three years, 2012/13–2017/18**

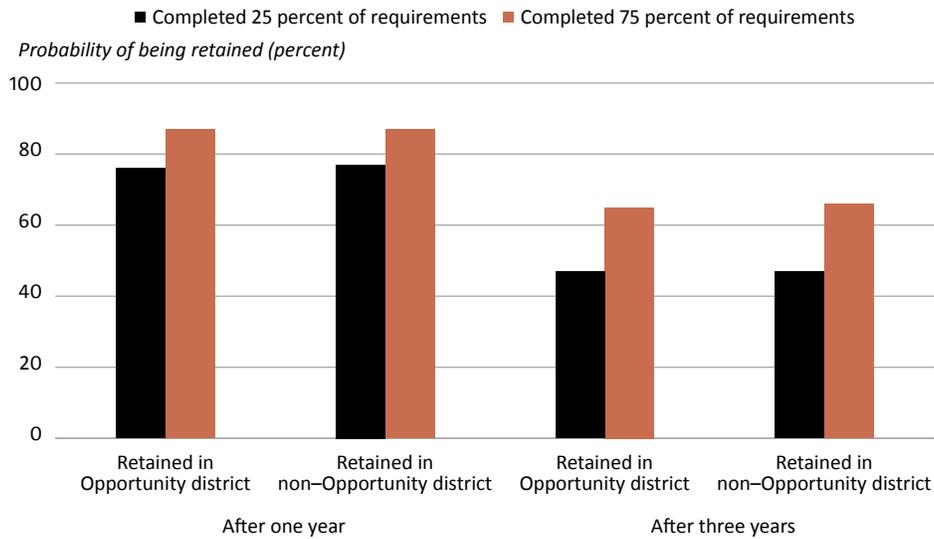


Note: The sample excludes the 2015/16 cohort, for which three-year retention data were not yet available. Predicted retention at 25 percent and 75 percent was calculated through interpolation, as the quartile points are customarily used for illustration. The actual percentage of completion, however, was more frequently on the multiple of 16, such as 33 percent or 83 percent.

Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

1. Table C6 contains analysis results in odds ratios, which is a formal and complete way of presenting the results of logistic regressions. Table C4 contains analysis results in predicted probabilities at interpolated quartiles, which is easier to understand, though limited in terms of comprehensiveness of information.
2. Table C7 contains analysis results in odds ratios, which is a formal and complete way of presenting the results of logistic regressions. Table C5 contains analysis results in predicted probabilities at interpolated quartiles, which is easier to understand, though limited in terms of comprehensiveness of information.

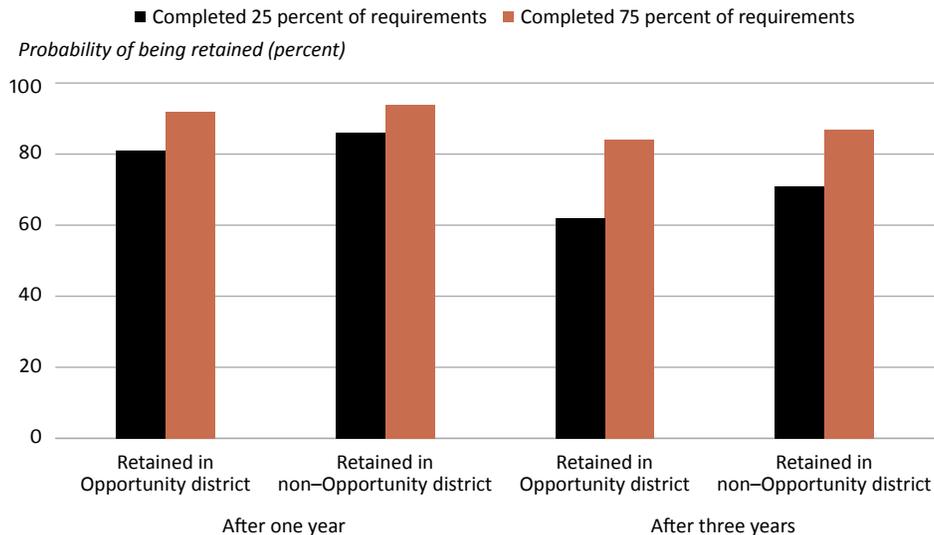
**Figure 4. Teachers in both Opportunity and non-Opportunity districts who completed more of the requirements of Connecticut’s Teacher Education and Mentoring Program were more likely to stay in the same district after one year of teaching and after three years, 2012/13–2017/18**



Note: Opportunity districts are the 10 districts with the lowest academic performance among the 170 districts in Connecticut. The sample excludes the 2015/16 cohort, for which three-year retention data were not yet available. The probability values in this figure are converted from the odds ratios in tables C6 and C7 in appendix C using a statistical procedure to make them easier to interpret. Predicted retention at 25 percent and 75 percent was calculated through interpolation, as the quartile points are customarily used for illustration. The actual percentage of completion, however, was more frequently on the multiple of 16, such as 33 percent or 83 percent.

Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

**Figure 5. Teachers in both Opportunity and non-Opportunity districts who completed more of the requirements of Connecticut’s Teacher Education and Mentoring Program were more likely to stay in the Connecticut public school system after one year of teaching and after three years, 2012/13–2017/18**



Note: Opportunity districts are the 10 districts with the lowest academic performance among the 170 districts in Connecticut. The sample excludes the 2015/16 cohort, for which three-year retention data were not yet available. The probability values in this figure are converted from the odds ratios in tables C6 and C7 in appendix C using a statistical procedure to make them easier to interpret. Predicted retention at 25 percent and 75 percent was calculated through interpolation, as the quartile points are customarily used for illustration. The actual percentage of completion, however, was more frequently on the multiple of 16, such as 33 percent or 83 percent.

Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

**Program adherence was higher for module completion and reflection paper submission than for teacher–mentor contact hours**

Approximately 86 percent of teachers completed two modules in the first year, and 75 percent of teachers completed all five modules in two years (figure 6; see also table C8 in appendix C).

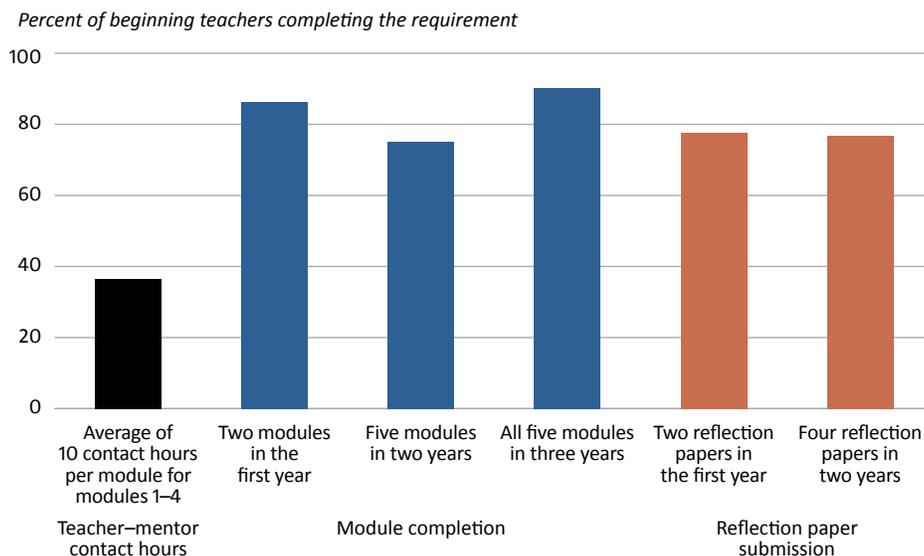
Only about 36 percent of teachers met the requirement for spending an average of 10 hours per module for modules 1–4 (see figure 6; see also table C8 in appendix C). Because of the low adherence for teacher–mentor contact hours and teacher attrition, only 14 percent of beginning teachers who started the TEAM Program completed all the program requirements. The average program adherence score for teachers who stayed through the second year was 0.74, meaning that they completed approximately 4.5 of the 6 program requirements.

**Completion of two of the six program requirements was higher for teachers in Alliance districts than for teachers in non–Alliance districts**

Teachers in Alliance districts had higher completion of the program requirements related to teacher–mentor contact hours. These requirements included a total of 20 contact hours with a mentor in the first year of the program and an average of 10 contact hours per module for modules 1–4 for the entire duration of the program. Approximately 29 percent of teachers in Alliance districts had a total of 20 contact hours with a mentor in their first year compared with 23 percent of teachers in non–Alliance districts (figure 7; see also table C9 in appendix C). Approximately 43 percent of teachers in Alliance districts had an average of 10 contact hours per module for modules 1–4 compared with 31 percent of teachers in non–Alliance districts.

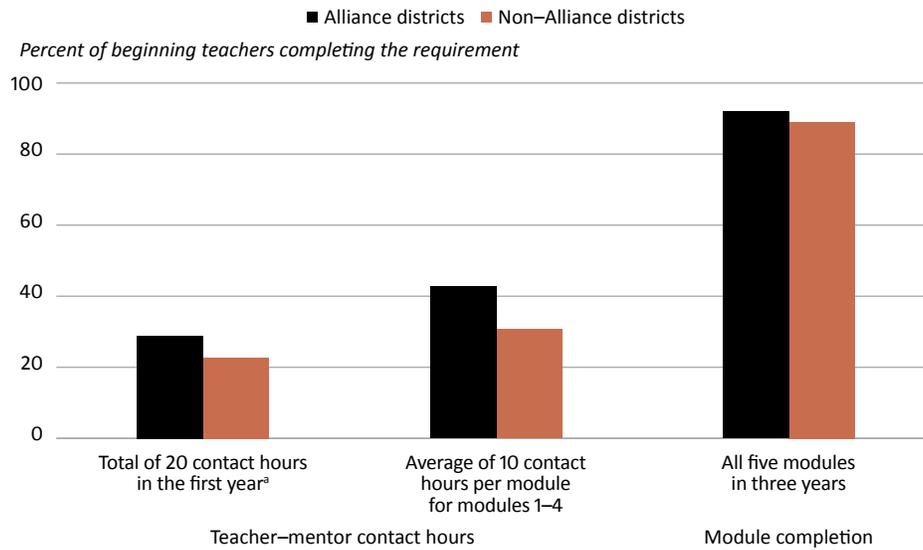
Teachers in Alliance districts also had higher completion of the program requirements related to module completion. A higher proportion of teachers in Alliance districts (92 percent) than of teachers in non–Alliance districts (89 percent) completed all five modules in three years, the maximum amount of time permitted if a teacher had extenuating circumstances (see figure 7 and table C9 in appendix C).

**Figure 6. More than 75 percent of beginning teachers in Connecticut’s Teacher Education and Mentoring Program completed the requirements for module completion and reflection paper submission, while less than 40 percent completed the requirements for teacher–mentor contact hours, 2012/13–2017/18**



Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

**Figure 7. A higher percentage of beginning teachers in Alliance districts than of teachers in non-Alliance districts met the requirements for teacher-mentor contact hours and completion of all five modules in Connecticut’s Teacher Education and Mentoring Program, 2012/13–2017/18**



Note: Results for completing two modules in the first year, completing five modules in two years, submitting two reflection papers in the first year, and submitting four reflection papers in two years are not shown because the differences between teachers in Alliance districts and teachers in non-Alliance districts were not statistically significant.

a. “Total of 20 contact hours in the first year” was an alternative measure for “10 hours per module” for the first-year analysis.

Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

A similar pattern of results was observed when data on adherence were disaggregated by school Title I status (see table C10 in appendix C), continuing the narrative about implementation of the TEAM Program in high-need, low-performing schools and districts. As might be expected, Title I schools are located primarily in Alliance districts. A comparison between teachers in the two types of Alliance districts, Opportunity and Priority, showed no clear pattern (see table C11 in appendix C).

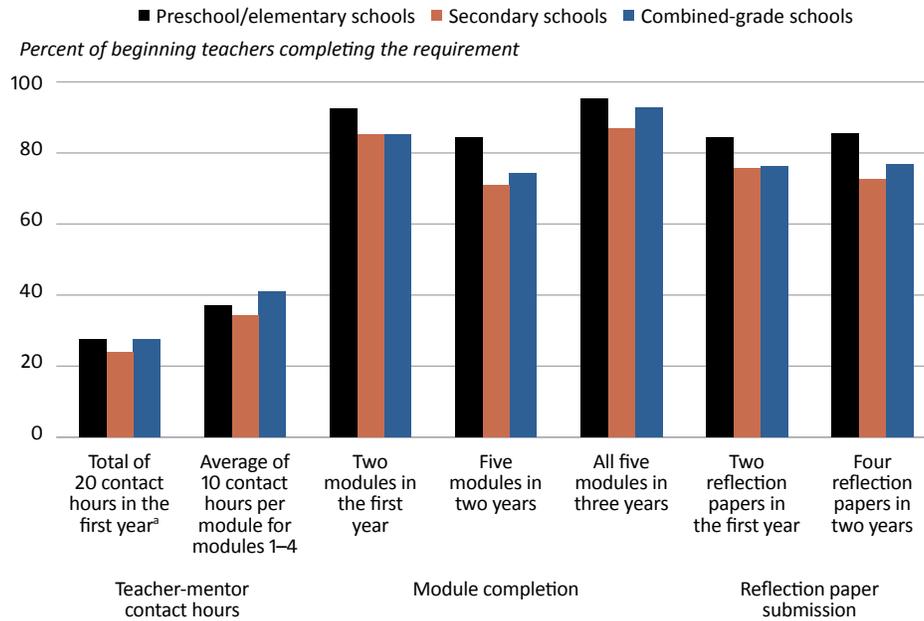
***Adherence to program requirements was higher for teachers in preschool/elementary schools than for teachers in secondary schools***

Approximately 93 percent of teachers in preschool/elementary schools completed two modules in the first year compared with 85 percent of teachers in secondary schools (figure 8; see also table C12 in appendix C). Approximately 84 percent of teachers in preschool/elementary schools completed all five modules in two years compared with 71 percent of teachers in secondary schools). Approximately 95 percent of teachers in preschool/elementary schools completed all five modules in three years, the maximum amount of time permitted if a teacher had extenuating circumstances, compared with 87 percent of teachers in secondary schools.

Approximately 84 percent of teachers in preschool/elementary schools submitted two reflection papers in the first year compared with 76 percent of teachers in secondary schools, and 86 percent of teachers in preschool/elementary schools submitted all four reflection papers in two years compared with 73 percent of teachers in secondary schools (see figure 8 and table C12 in appendix C).

Approximately 28 percent of teachers in preschools/elementary schools had a total of 20 contact hours with their mentor in the first year compared with 24 percent of teachers in secondary schools (see figure 8 and table C12 in appendix C).

**Figure 8. Adherence to the requirements of Connecticut’s Teacher Education and Mentoring Program was higher for teachers in preschool/elementary schools than for teachers in secondary schools, 2012/13–2017/18**



Note: Preschool/elementary schools are schools with a grade span of preschool through grade 5, secondary schools are schools with a grade span of grades 6–12, and combined-grade schools are schools whose grade span encompasses preschool, elementary, and secondary grades.

a. “Total of 20 contact hours in the first year” was an alternative measure for “10 hours per module” for the first-year analysis.

Source: Authors’ analysis of 2012/13–2017/18 data from the Connecticut State Department of Education.

Program adherence for teachers in combined-grade schools was between that for teachers in preschool/elementary schools and that for teachers in secondary schools, except for contact hours, for which adherence was highest for teachers in combined-grade schools (see figure 8 and table C12 in appendix C).

### Limitations

This study found a positive relationship between adherence to the TEAM Program requirements and teacher retention. However, the results do not necessarily indicate that higher program adherence causes higher teacher retention. The results could be due in part to other, unobserved factors such as the motivation of teachers to stay in the district or profession, the professional culture of the school, and other factors affecting teacher morale (Senechal et al., 2016). In addition, the study did not examine data on support to beginning teachers that may exist in the district or school, in addition to the TEAM Program. The measure of adherence used in this study could be affected by such additional support.

The study is limited by the way in which program adherence was measured. Using the TEAM Program Manual, the study team counted the number of program requirements for which a teacher met its threshold for adherence. The adherence score was then calculated by dividing this number by the total number of requirements. Since only six requirements were included in the calculation, the adherence score was coarsely scaled. In other words, the adherence score could take only several discrete values between 0 and 1, unlike a typical continuous variable with numerous potential values. For that reason, a subtle nuance in the pattern of the results might have been lost.

The data available to examine adherence were also limited, so the adherence score was based on only six of the eight program requirements. Being assigned a mentor within 30 days was not included in the calculation because of data quality issues. Having a total of 50 contact hours was not used because it was conflated with the length

of time a teacher was teaching (see appendix B for details). Also, because mentors document contact hours and districts monitor the documentation, the lack of data for that requirement may mean that the results do not accurately reflect the extent to which teachers completed the requirement.

The adherence score is not weighted, and its calculation treats each program requirement equally. As such, the study does not shed light on the relative importance of requirements or the relationships among them.

The way retention was measured also poses limitations. Retention was captured annually using data from the state's Employment/Assignment database. As such, midyear dropouts could affect completion of the program requirements. However, the data indicate that most midyear dropout occurred toward the end of the school year, making it less likely that it affected completion. A sensitivity analysis predicting retention after three years that included only teachers who completed two years (the regular duration) of the program confirmed that the adherence–retention relationship was not a product of early attrition.

Finally, this study investigated only the association between TEAM program adherence and teacher retention. An equally important outcome, teacher effectiveness, was not investigated.

## Implications

The study findings indicate a possible benefit of teacher induction programs. Teachers who completed more of the program requirements were more likely to stay in the same district or in the Connecticut public school system. In addition, teachers who completed more of the program requirements were more likely to stay in the same district even in Opportunity districts—the 10 lowest performing districts in the state—which had the lowest teacher retention rates. The Connecticut State Department of Education might want to undertake a rigorous research study to understand whether completing more requirements contributes to a teacher's likelihood of remaining.

It would also be beneficial to know whether specific modules were particularly helpful to teachers in Opportunity districts or whether some teachers who were struggling to teach in the lowest performing districts were also unable to find the time and energy to complete the program requirements. If the latter is the case, such teachers might need additional supports so that they are less overwhelmed by their day-to-day instructional responsibilities and are also able to access the professional development offered by the TEAM Program.

A second important finding is that program adherence varied by program requirement, school grade span, and district performance category. The study was not designed to determine the reasons behind the variation, but the state and districts might want to interview teachers and administrators in order to identify possible reasons and strategies for ensuring more even implementation.

Third, the proportion of teachers completing each requirement was lowest for the requirements related to contact hours with a mentor. The Connecticut State Department of Education could direct additional support toward implementation and documentation of contact hours between beginning teachers and mentors. The finding may be due simply to insufficient recordkeeping, so districts might want to ensure that teachers and mentors are accurately recording contact hours. If the finding of lower-than-required contact hours persists after recordkeeping concerns are addressed, districts and the state department of education might want to investigate factors such as new teachers' perceptions of the value of mentoring and mentors' time constraints and scheduling challenges.

Fourth, an average of 10 contact hours per module was not reliably related to retention, but this study was not designed to shed light on why this was the case. It could be that this requirement is not as important as others. Alternatively, teachers who are predisposed to remain in their district or the state might also be less predisposed

to seek out a mentor. Future rigorous research could investigate whether mentoring has an impact on teacher retention.

Finally, this study contributes to the growing body of research on the potential benefits of teacher induction (for example, Bastian & Marks, 2017; Cohen & Fuller, 2006; Ingersoll & Smith, 2004a, 2004b; see appendix A) and provides an example of how to develop adherence measures for induction programs. The results and methods of this study may be of interest to other states and districts that are considering implementing, or are already implementing, a teacher induction program. Those states and districts might want to conduct similar analyses of induction programs with their own data to understand whether adherence differs, and if so, whether the difference is related to teacher retention.

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