IES Institute of Education Sciences

APPENDIXES
May 2021

Regional Educational Laboratory Southwest
At American Institutes for Research

Outcomes for Early Career Teachers Prepared through a Pilot Residency Program in Louisiana

See https://go.usa.gov/xHnqJ for the full report.

Appendix A. The Louisiana Believe and Prepare pilot program

This study examined early career outcomes for participants in the Louisiana Believe and Prepare pilot program that launched in 2014. Louisiana lacks enough qualified teachers in virtually every subject, with more acute shortages in math, science, and special education (Louisiana Department of Education, 2015; U.S. Department of Education, 2017). In 2014 the Louisiana Department of Education surveyed new teachers, district administrators, and teacher preparation faculty to determine how to prepare high-performing teachers, as defined by the Louisiana Compass teacher evaluation system (Louisiana Department of Education, 2014). The survey results highlighted the need for greater alignment and collaboration between school districts and teacher preparation programs to improve teacher preparation of teacher candidates, respond to district needs and teacher shortages, improve teacher hiring practices, and pair new teachers with qualified mentors and coaches.

To respond to these challenges and needs, the Louisiana Department of Education launched the Believe and Prepare pilot program, which provided grants to school districts (known as "school systems" in Louisiana), in partnership with teacher preparation providers, to develop and implement teacher residency programs. The Believe and Prepare pilot program emphasized three components: competency-based coursework, a yearlong residency, and mentor teachers (table A1). The pilot was an opportunity for teacher preparation providers to develop a residency for practice-based preparation experiences to improve teacher preparation, recruitment, and retention.

The pilot program was based on research that suggests that well designed and well implemented teacher residency models can improve teacher retention (Singh, 2017; Van Overschelde et al., 2017; Whipp & Geronime, 2017). Researchers and advocates have emphasized the importance of including high-quality, long-term clinical experiences in the preparation of new teachers (Carnegie Corp, 1986; Darling-Hammond, 2006; Goodlad, 1991; Greenhill, 2010; Holmes Group, 1986; Levine, 2006; National Commission on Teaching and America's Future, 1996; National Council for Accreditation of Teacher Education, 2010). Teacher residencies are an increasingly popular strategy for providing clinical experience (Britt et al., 2016; Guha et al., 2017). Studies of teacher residency programs in New York City and Boston found higher retention rates within the district four or five years into teaching for new teachers prepared through residency programs in the district than for other new teachers (Papay et al., 2012; Sloan & Blazevski, 2015). A study of 12 teaching residency programs funded through U.S. Department of Education's Teacher Quality Partnership grants found similar rates of retention within schools for

new teachers trained through residency programs and those who were not but higher within-district retention rates for teachers trained through residency programs (Silva et al., 2015).

Table A1. Believe and Prepare pilot program expected components

Component	Description
Competency-based coursework	• Redesign teacher preparation coursework through a partnership between teacher preparation program faculty and district leadership to emphasize essential teaching knowledge and skills and school-based, practice-oriented experience. • Develop learning outcomes, learning tasks, and performance assessments for preservice teachers through a partnership between district leaders and teacher preparation program faculty. • Use performance assessments of preservice teachers to determine their progress through the program. • Require preservice teachers to complete the revised coursework as a condition of receiving their degree
Teacher residency	• Implement a yearlong residency for preservice teachers to co-teach in the classroom up to five days a week during preservice teachers' residency year (typically in year 4 of the degree program following the completion of other coursework). • Place preservice teachers in traditional public schools, based on staffing needs and local decisions; emphasize placement in rural schools and schools needing special education teachers. • Provide participating preservice teachers with a stipend of $2,000 from the Louisiana Department of Education during the residency year.
Mentor teacher recruitment, selection, and training	• Select mentors and teacher preparation program leads based on their demonstrated success with students and exhibited leadership qualities and skills. • Deliver teacher preparation program–based mentor training throughout the school year to develop and refine mentor coaching and feedback skills. • Provide participating mentor teachers with a stipend of $1,000 from the Louisiana Department of Education. • Provide opportunities (not requirements) for districts to develop teacher leadership pathways for effective teachers to engage in mentoring and coaching.

Source: Authors' compilation based on information available on the Louisiana Department of Education website.

Through the Believe and Prepare pilot program, teacher preparation providers and their partner districts redesigned teacher preparation coursework to emphasize essential teaching knowledge and skills and school-based, practice-oriented experience. In addition, Believe and Prepare pilot teacher preparation providers and districts placed preservice teachers in residency at participating schools as part of their teacher preparation experience, a departure from typical practice in Louisiana in which preservice teachers completed one semester of student teaching to fulfill requirements for certification. In the residency period preservice teachers led classroom instruction most of the time, with support from mentors. Believe and Prepare partners were allowed autonomy to design coursework and preparation experiences to fit local needs and were expected to adjust preparation experiences to the needs of preservice teachers. The Louisiana Department of Education expected local variation in program implementation but did not systematically collect information on local program decisions and implementation for the pilot programs.

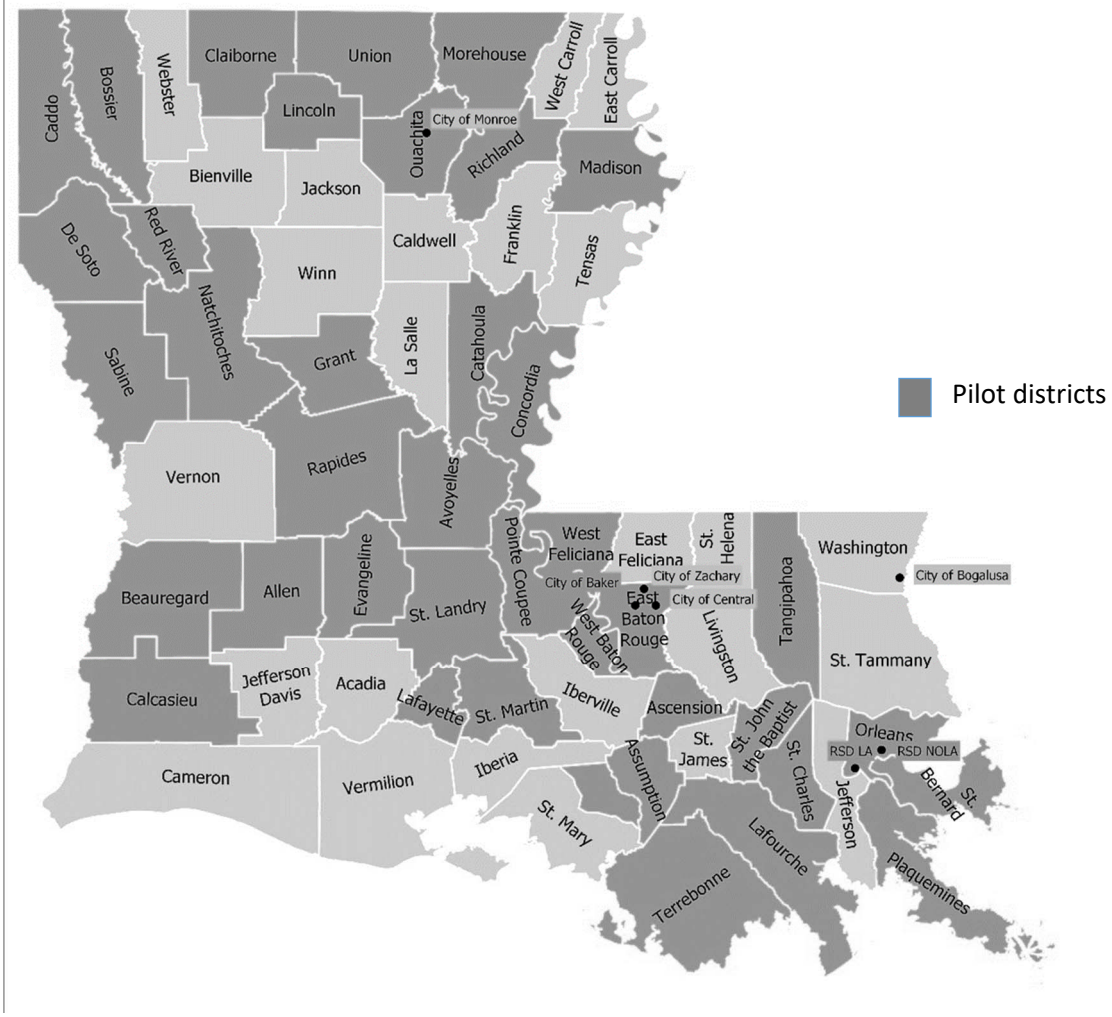
Since 2014 the Louisiana Board of Elementary and Secondary Education has awarded more than $9 million in Believe and Prepare grants to teacher preparation providers and their district partners (Louisiana Department of Education, 2017). Three cohorts of teacher candidates participated in the Believe and Prepare pilot program: cohort 1 in 2014/15, cohort 2 in 2015/16, and cohort 3 in 2015/16 and 2016/17.[1] Districts could participate in multiple cohorts. To apply for the Believe and Prepare pilot grants, a district and its collaborating teacher preparation provider(s) submitted an application that detailed their plan for school-based teacher preparation.

[1] The grant award period for cohort 3 extended from 2015/16 through 2016/17. Some participants started in spring 2016, and others started in fall 2016.

The application was evaluated on four criteria: demonstration of needs, program design, program evaluation plan, and program sustainability and expansion plan. Districts that participated in at least one of the pilot cohorts are shown in figure A1. During the pilot years school districts and teacher preparation providers applied for the grants through a joint application; a teacher preparation provider could apply with multiple district partners. The Louisiana Department of Education oversaw the grants and required that teacher preparation providers identify the residency and placement sites and that partner districts confirm the residency placement.

In 2016 the Louisiana Board of Elementary and Secondary Education, with support from the Louisiana Board of Regents, adopted regulations to expand the residencies statewide. The Louisiana Department of Education set the goal that all teacher preparation programs should include a yearlong residency as well as a competency-based curriculum and an expert mentor by July 2018 (https://www.louisianabelieves.com/teaching/believe-and-prepare). Candidates admitted into teacher preparation programs in the 2018/19 school year were the first statewide cohort to experience the required year-long residency and new competency-based curricula.

Figure A1. Districts participating in Louisiana's Believe and Prepare program pilot, 2014/15–2016/17



Source: Authors' compilation based on data provided by the Louisiana Department of Education.

References

Britt, M., Donahue, T., & Judge, S. (2016). A teacher-immersion residency program that prepares highly effective educators: An innovative model. *International Journal of Pedagogy & Curriculum*, *23*(3), 13–24.

Carnegie Corp. (1986). *A nation prepared: Teachers for the 21st century*. Carnegie Forum on Education, Task Force on Teaching as a Profession. https://eric.ed.gov/?id=ED268120.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education*, *57*(3), 300–314. https://eric.ed.gov/?id=EJ736690.

Goodlad, J. I. (1991). Why we need a complete redesign of teacher education. *Educational Leadership*, *49*(3), 4–6. https://eric.ed.gov/?id=EJ435734.

Greenhill, V. (2010). *21st century knowledge and skills in educator preparation*. American Association of Colleges for Teacher Education and Partnership for 21st Century Skills. https://eric.ed.gov/?id=ED519336.

Guha, R., Hyler, M. E., & Darling-Hammond, L. (2017). The teacher residency: A practical path to recruitment and retention. *American Educator*, *41*(1), 31. https://eric.ed.gov/?id=EJ1137804.

Holmes Group. (1986). *Tomorrow's teachers: A report of the Holmes Group*. https://eric.ed.gov/?id=ED270454.

Levine, A. (2006). *Educating school teachers*. Education Schools Project. https://eric.ed.gov/?id=ED504144.

Louisiana Department of Education. (2014). *Partners in preparation: A survey of educators & education preparation programs*. https://www.louisianabelieves.com/docs/default-source/links-for-newsletters/partners-in-preparation-survey-report.pdf?sfvrsn=6.

Louisiana Department of Education. (2015). *Louisiana's plan for ensuring equitable access to excellent teachers for all students*. http://www2.ed.gov/programs/titleiparta/equitable/laequityplan12315.pdf.

Louisiana Department of Education. (2017). *Believe and prepare: Access to full preparation for teachers in rural communities.* https://www.louisianabelieves.com/docs/default-source/teaching/2017-believe-and-prepare-rural-report.pdf.

National Commission on Teaching and America's Future. (1996). *What matters most: Teaching for America's future*. https://eric.ed.gov/?id=ED395931.

National Council for Accreditation of Teacher Education. (2010). *Transforming teacher education through clinical practice: A national strategy to prepare effective teachers* (Report of the Blue Ribbon Panel on Clinical Preparation and Partnerships for Improved Student Learning). https://eric.ed.gov/?id=ED512807.

Papay, J. P., West, M. R., Fullerton, J. B., & Kane, T. J. (2012). Does an urban teacher residency increase student achievement? Early evidence from Boston. *Educational Evaluation and Policy Analysis*, *34*(4), 413–434. https://eric.ed.gov/?id=EJ985263.

Silva, T., McKie, A., & Gleason, P. (2015). *New findings on the retention of novice teachers from teaching residency programs* (NCEE No. 2015-4015). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://eric.ed.gov/?id=ED560735.

Singh, D. K. (2017). Role of clinical practice in teacher preparation: Perceptions of elementary teacher candidates. *Education*, *138*(2), 179–189. https://eric.ed.gov/?id=EJ1162453.

Sloan, K., & Blazevski, J. (2015). *New visions Hunter College urban teacher residency: Measures of success*. https://b.3cdn.net/nvps/d1725192f4cb60167f_qsm6vz3qx.pdf.

U.S. Department of Education. (2017). *Teacher shortage areas nationwide listing 1990–1991 through 2017–2018.* https://www2.ed.gov/about/offices/list/ope/pol/ateachershortageareasreport2017-18.pdf.

Van Overschelde, J. P., Saunders, J. M., & Ash, G. E. (2017). "Teaching is a lot more than just showing up to class and grading assignments:" Preparing middle-level teachers for longevity in the profession. *Middle School Journal*, *48*(5), 28–38. https://eric.ed.gov/?id=EJ1159410.

Whipp, J. L., & Geronime, L. (2017). Experiences that predict early career teacher commitment to and retention in high-poverty urban schools. *Urban Education*, *52*(7), 799–828. https://eric.ed.gov/?id=EJ1150459.

Appendix B. Data and methods

This appendix describes the data sources, data preparation, study samples, and methods used to complete the analyses.

Data sources

This study used a combination of administrative data collected by the Louisiana Department of Education and publicly available data.

The Louisiana Department of Education provided three datasets:

1. Records of Believe and Prepare pilot participants who participated in the program from 2014/15 through 2016/17.
2. Certification data from the Teacher Certification Management System from 2014/15 through 2017/18 (certification dataset).
3. Teaching records from the Profile of Educational Personnel from 2014/2015 through 2018/19 (employment dataset)

The records could be linked across the three datasets using a random unique identifier for each teacher, when available.

The study also employed publicly available data from the Louisiana Department of Education's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and the National Center for Education Statistics Common Core of Data from 2014/15 through 2017/18 (National Center for Education Statistics, 2016, 2017, 2018, 2019).

Data preparation

Records of Believe and Prepare pilot participants. The dataset consisted of 744 records of Believe and Prepare pilot participants, based on records provided by grantee teacher preparation providers and school districts to the Louisiana Department of Education. Variables included unique random individual identification number, cohort, teacher preparation program name, teacher preparation subject, undergraduate major, district of residency, school of residency, teacher preparation program year, and teacher preparation program completion status.

The random unique identifiers were assigned by the Louisiana Department of Education. Of the 744 records of pilot program participants, 491 (66 percent) could be matched to the data collected through the Profile of Educational Personnel End of Year data submission that district data managers completed for 2014/15–2016/17. These participants were assigned random unique identifiers. The remaining 253 participants (34 percent) could not be matched to the department's personnel records and so were not assigned unique identifiers.

The Louisiana Department of Education used the data submitted by teacher preparation program providers and district participants for Believe and Prepare funding to match to data collected through the Profile of Educational Personnel End of Year data submission that district data managers completed to validate and assign social security numbers to program participants. End of Year records included data from 2014/2015 through 2016/17. Only 21 percent of Believe and Prepare program records were reported with Social Security numbers. The Louisiana Department of Education used participants' first and last name, district code, and school code to match records and validate Social Security numbers in the program records or assign correct Social Security numbers (from the End of Year data) to participants. The department conducted automated matches based on those variables as well as manual matches to look up records for matches and was able to validate or assign Social Security numbers to

66 percent of program participants. Random unique identifiers were then generated for these participants. Believe and Prepare pilot participants with identifiers and those without identifiers differed from each other in cohort and teacher preparation program subject (see tables C12 and C13 in appendix C). However, there were no statistically significant differences in the characteristics of the school or district of residency between the two groups (see tables C14 and C15 in appendix C).

The study team performed the following key data preparation steps:

- Requested that the Louisiana Department of Education identify and remove duplicate records among the 253 records that could not be matched to the department's certification or personnel records. That reduced the number to 245 unique records without identifiers. Because these 245 records could not be linked to certification or personnel records, they could not be used to examine the outcomes of interest. It is possible that some of these participants did not teach in Louisiana between 2014/15 and 2016/17. Some might have entered teaching after 2016/17. The Louisiana Department of Education indicated that many of the records were not matched because the program records submitted by teacher preparation providers or school systems did not include Social Security number or other data necessary for matching. Name changes or data reporting errors could also account for the inability to match some of the program records.
- Removed duplicate records from the 491 records with identifiers. For the 23 pairs of duplicate records that differed in cohort designation, the record with the earlier cohort was removed.[1] This resulted in 468 unique records of Believe and Prepare participants in the analytic dataset.
- Recoded district of residency identifiers. District identifiers for Recovery School Districts[2] in the Believe and Prepare data did not match the district identifiers in the employment dataset. For districts with the same name but with different district identifiers, the study team replaced the district identifier in the Believe and Prepare dataset (105 records) with the district identifier from the employment dataset. An additional 10 records in the Believe and Prepare dataset for Recovery School Districts did not have a close district name match in the employment file and were given researcher-assigned district identifiers for each unique residency district name.

With duplicates removed, the sample included 713 unique Believe and Prepare pilot participants, 468 of them with identifiers and 245 without identifiers.

Certification data from the Teacher Certification Management System. The certification dataset consisted of 134,794 records of teacher certifications issued from 2014/15 through 2017/18 for 26,360 unique teachers. Variables included unique random individual identification number, certification type code, certification number, valid to/from dates, issue date, program identifier, and program place name. Each row was a unique certification/endorsement area associated with a specific teaching certificate. Teachers with more than one certificate or more than one endorsement per certificate appeared in multiple rows in the data. The study team prepared the data using the following key steps:

- Created a variable to indicate the first certification issued to each teacher between 2014/15 and 2017/18.
- Created a variable to indicate whether teachers received a Level 1 professional certificate after 2014/15.

[1] One of the 23 pairs also differed in school of residency.

[2] In 2003 the Louisiana legislature created the Recovery School District to turn around the lowest performing schools in the state. From November 2005 through June 2018 the Recovery School District directly operated dozens of schools and authorized charter schools (Louisiana Department of Education, n.d.).

- Generated a certification subject variable using a classification system provided by the Louisiana Department of Education to classify subjects.
- Reshaped data to make each row a unique teacher.

Teaching records from the Profile of Educational Personnel. The employment dataset consisted of 744,092 records of 69,863 unique teachers who taught in Louisiana's public schools between 2014/15 and 2018/19. Variables included unique random individual identification number, school year, district identifier and name, school identifier and name, gender, race/ethnicity, years of experience, highest level of education, academic area, and course information (name, type, and description). Each record was a unique course that the teacher taught in a particular school year. To prepare the data for analysis, the study team performed the following key steps:

- Created binary variables for race/ethnicity, gender, and highest level of education to indicate whether teachers were White, were female, or had at least a master's degree.
- Created three retention variables, for retention in state, retention in district, and retention in school. The study team identified the first year in which teachers appeared in the employment dataset. Then, the study team created binary variables to indicate whether teachers had records in the employment dataset one year after first appearing in the file for any district in Louisiana, for the same district, and for the same school. Teachers who taught in multiple districts or in multiple schools in the year they first appeared in the personnel records were considered to have been retained in the same district or school if any one of the employment district or school identifiers was the same the following year.
- Created two binary variables to indicate whether teachers in the first year of employment were employed in the district in which they served their residency and whether they were employed in the same school as during their residency. Teachers who taught in multiple districts or schools in their first year of employment were considered to have taught at their district or school of residency if the residency district or school matched any of the multiple employment districts or schools.
- Created a variable in the first record in the employment file for subject(s) taught based on the course description variables (for example, math, special education, trade, and industry) and academic area description variables (for example, elementary, middle grades, and vocational) using a classification system provided by the Louisiana Department of Education.
- Created a unique record for each teacher. The study team aggregated records for individual teachers from the original dataset to create a unique record for each teacher with variables on teacher characteristics, first year of employment, and retention.

Merger of teacher-level data. After preparing each of the three files provided by the Louisiana Department of Education, the study team merged the files using the common teacher identifier, retaining all unique records from each file. Binary variables were created to indicate whether a record in one file had a match in another. These merged data were used to identify the samples of early career Believe and Prepare participants for the various outcomes, as discussed later in this appendix. These data also identified 10,275 other early career teachers in Louisiana.

School demographic data. Data on school characteristics were obtained for 2014/15–2017/18 from the Louisiana Department of Education's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and from the National Center for Education Statistics Common Core of Data (National Center for Education Statistics, 2016, 2017, 2018, 2019). The Louisiana Department of Education's Data Center provided school demographic data, including total enrollment, percentages of students by race/ethnicity, percentage of

economically disadvantaged students, and percentage of English learner students. The National Center for Education Statistics Common Core of Data provided data on administrative characteristics, such as school urban-centric locale codes, charter school designation, and instructional level (primary, middle, high, other).[3] The study team performed the following key steps in preparing the data:

- Merged the school demographic and school administrative data files by school identifier and school year.
- Recoded variables for school locale and level. The study team used the four major school locale categories from the Common Core of Data (city, suburb, town, and rural) for descriptive analyses. For regression analyses the study team recoded school locale to a binary variable indicating whether the school was urban (city) or not (suburb, town, and rural). Similarly, the study team used the four Common Core of Data categories for school grade level (primary, middle, high, and other) for descriptive analyses and recoded school level for regression analyses to a binary variable indicating whether the school was a primary school (with a value of 1) or a nonprimary school (with a value of 0). (See box 1 in the main report for definition of school grade level.)

District demographic data. Data on district characteristics were obtained for 2014/15–2017/18 from the Louisiana Department of Education's Data Center webpage. Data included total enrollment, percentage of economically disadvantaged students, percentage of racial/ethnic minority students, and percentage of English learner students at the district level.

Merger of teacher data with school and district data. The study team merged the teacher data (from the file after merging the three datasets provided by the Louisiana Department of Education) with the school and district characteristic datasets. Believe and Prepare pilot participants were linked to two sets of school characteristics: residency school/district characteristics using the residency school/district identifier and cohort year and employment school/district characteristics using school/district identifier and the first year it appeared in the employment dataset. Other teachers in the state who did not participate in the Believe and Prepare pilot were linked only to characteristics of the school and district of employment. For teachers who taught at multiple schools in their first year of teaching, the study team took the average across schools for each characteristic.

Missing data

The data files used for the study included teacher and school records with missing data.

Teacher-level data. Of the 713 Believe and Prepare pilot participants, 71 records (10 percent) did not have identifiers for school of residency and therefore did not have associated demographic data for school of residency.[4] Of the records for the 468 Believe and Prepare pilot participants with identifiers, 36 records (8 percent) did not have identifiers for school of residency.

Of the 468 Believe and Prepare pilot participants with identifiers, 430 (92 percent) had at least one record in the employment dataset. Teacher demographic data were available only for these 430 teachers because only the employment dataset included demographic data. Of these 430 teachers, 11 (3 percent) were missing data on race/ethnicity, and none was missing data on gender or highest level of education.

[3] The available data included the percentage of students by proficiency level, a measure of school-level achievement for schools serving students in grades 3–8. Because a comparable measure of school achievement was not available for K–2 schools or secondary schools, school achievement was excluded from this study.

[4] The Louisiana Department of Education confirmed that unsuccessful matches to school identifiers, given the information reported to the department (for example, the name of the school submitted did not match the department's records), was the primary reason these records did not have identifiers for school of residency.

Of the 10,275 early career teachers who did not participate in the Believe and Prepare pilot program, 1,173 (11 percent) were missing data on race/ethnicity, 943 (9 percent) were missing data on gender, and 1,108 (11 percent) were missing data on highest level of education.

Teachers who were missing data on a variable were excluded from relevant analyses.

School and district demographic data. For schools and districts with missing data for a particular year, the study team used demographic data from the latest year available. Doing so resulted in no missing demographic data for school of residency among Believe and Prepare pilot participants who had nonmissing residency school identifiers, and no missing demographic data for schools of employment for the 430 Believe and Prepare pilot participants who had records in the employment file. Among the 10,275 other early career teachers in the state, 102 (1 percent) were missing demographic data on school of employment. Records with missing demographic data were excluded from relevant analyses.

Variables

The data preparation process described above resulted in the set of teacher, school, and district variables used in the analysis and shown in table B1.

Table B1. Summary of variables used in the analysis of participants in the Believe and Prepare pilot program, 2014/15–2018/19

Variable	Data source	Variable description
Outcome		
Received Level 1 certification after 2014/15	Derived from LDOE provided data	1= Received Level 1 professional certificate after 2014/15 0 = Did not receive Level 1 professional certificate after 2014/15
Entered teaching	Derived from LDOE provided data	1 = Entered teaching in Louisiana after 2014/15 0 = Did not enter teaching in Louisiana after 2014/15
Retention In the district	Derived from LDOE provided data	1 = Retained in the district in the second year of teaching 0 = Not retained in the district in the second year of teaching
Retention in the school	Derived from LDOE provided data	1 = Retained in the school in the second year of teaching 0 = Not retained in the school in the second year of teaching
Retention in the state	Derived from LDOE provided data	1 = Retained in the state in the second year of teaching 0 = Not retained in the state in the second year of teaching
Believe and Prepare pilot program participation		
Believe and Prepare pilot cohort	LDOE: Believe and Prepare program records	1 = Cohort 1 (2014/15); 2 = Cohort 2 (2015/16); 3 = Cohort 3 (2015/16 or 2016/17)
Residency school identifier	LDOE: Believe and Prepare program records	Six-character alphanumeric code indicating the school in which the teacher served the residency
Residency district identifier	LDOE: Believe and Prepare program records	Three-character alphanumeric code indicating the district in which the teacher served the residency
Teacher preparation provider name	LDOE: Believe and Prepare program records	Name of teacher preparation provider
Teacher preparation subject	LDOE: Believe and Prepare program records	Subject while enrolled in the teacher preparation program
First school of employment is residency school	Derived from LDOE provided data	1 = First school of employment was school of residency 0 = First school of employment was not school of residency

Variable	Data source	Variable description
Teacher demographics		
Race/ethnicity	LDOE: Employment dataset	American Indian or Alaska Native, Asian, Black or African American, Hispanic, Native Hawaiian or Pacific Islander, White, multiple (two or more races/ethnicities) Dummy variable for White used in regression analysis (1 = White; 0 = other race/ethnicity)
Gender	LDOE: Employment dataset	1 = Female 0 = Male
Highest level of education	LDOE: Employment dataset	Dummy variable for possession of master's degree or higher used in regression analysis based on data provided (1 = master's degree or higher, including master's degree, master's degree +30 additional graduate units, educational specialist, and doctorate; 0 = less than a master's degree, including less than high school, high school, trade/technical certificate, one year of college, two years of college, associate degree, three years of college, bachelor's degree)
Certification		
Certification type	LDOE: Certification dataset	Type of certification (for example, Level 1 professional certificate, Level 2 professional certificate, Level 3 professional certificate)
First certificate	LDOE: Certification dataset	The first certification issued between 2014/15 and 2017/18
Certification subject	LDOE: Certification dataset and subject designations provided by LDOE	One of 17 subject categories in which teachers attained certification[a]
Certification issue year	LDOE: Certification dataset	Certification issue date
Employment		
Year first appear	LDOE: Employment dataset	First year of appearance in the employment dataset, between 2014/15 and 2018/19
Employment school identifier	LDOE: Employment dataset	Code indicating the school in which teachers taught in their first year of teaching (that is, the school associated with the earliest record in the employment dataset)
Employment district identifier	LDOE: Employment dataset	Code indicating the district in which teachers taught in their first year of teaching (that is, district associated with the earliest record in the employment dataset)
Course category description	LDOE: Employment dataset	Category of the course taught in teachers' first year of teaching
Academic area description	LDOE: Employment dataset	Academic area of the course taught in teachers' first year of teaching (all grades [K–12], elementary–middle [1–8], kindergarten [PK-K], elementary [1–5], middle school [6–8], secondary [9–12], non-public [K–12], ROTC, vocational [6–12])
Employment subject	LDOE: Employment dataset	One of 22 subject categories teachers taught in a particular year[b]
School		
Total enrollment	LDOE Data Center	Number of students enrolled at the school
Percentage of racial/ethnic minority students	LDOE Data Center	Percentage of racial/ethnic minority students at the school
Percentage of English learner students	LDOE Data Center	Percentage of English learner students at the school

Variable	Data source	Variable description
Percentage of economically disadvantaged students	LDOE Data Center	Percentage of economically disadvantaged students at the school
School locale	NCES: Common Core of Data	City, suburb, town, and rural Dummy variable for urban locale used in regression analysis (1 = city; 0 = suburb, town, or rural)
School grade level	NCES: Common Core of Data	Primary, middle, high, other Dummy variable for primary used in regression analysis (1 = primary; 0 = other school grade level)]
Charter	NCES: Common Core of Data	Charter or not charter school (1 = charter school; 0 = not charter school)
District		
Total enrollment	LDOE Data Center	Number of students enrolled in the district
Percentage of racial/ethnic minority students	LDOE Data Center	Percentage of racial/ethnic minority students in the district
Percentage of English learner students	LDOE Data Center	Percentage of English learner students in the district
Percentage of economically disadvantaged students	LDOE Data Center	Percentage of economically disadvantaged students in the district
Percentage of students scoring at least basic in English language arts (average across grades 3–8)	LDOE Data Center	Percentage of students scoring at least basic in English language arts (average across grades 3–8) in the district
Percentage of students scoring at least basic in math (average across grades 3–8)	LDOE Data Center	Percentage of students scoring at least basic in math (average across grades 3–8) in the district

LDOE is Louisiana Department of education. NCES is National Center for Education Statistics.
a. The subject categories are art, early childhood, elementary education, English/language arts–middle grades, English/language arts–secondary grades, foreign languages, health and physical education, math–middle grades, math–secondary grades, music, science–middle grades, science–secondary grades, social studies–middle grades, social studies–secondary grades, special education, speech, and other.
b. The subject categories are all grades English/language arts, math, science, and social studies, and speech; art; early childhood; elementary English/language arts; elementary; foreign languages; health and physical education; middle grades English/language arts; middle grades math; middle grades science; middle grades social studies; music; secondary English/language arts; secondary math; secondary science; secondary social studies; special education; and other.
Source: Authors' compilation based on data provided by the Louisiana Department of Education, data obtained from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center), and data obtained from National Center for Education Statistics (2016, 2017, 2018, 2019).

Sample

The Believe and Prepare pilot program served primarily undergraduate teacher candidates. However, the Louisiana Department of Education indicated that the pilot program also included participants from university-based post-baccalaureate programs and alternate programs, as well as some certified or in-service teachers pursuing additional certifications. For this study the Louisiana Department of Education was interested primarily in early career Believe and Prepare pilot participants. Therefore, in consultation with the Louisiana Department of Education, the study team applied the following set of exclusion criteria to the sample of 468 Believe and Prepare pilot participants with identifiers to remove participants who were likely to be experienced teachers or whose experience could not be determined using the data available:

- Based on certification records, teachers who were issued a Level 1 professional certificate in 2014/15, that is, prior to or during the first year of the Believe and Prepare pilot program (n = 4).

- Based on certification records, teachers whose first certificate was issued between 2014/15 and 2017/18 and required at least three years of experience, such as a Level 2 or Level 3 professional certificate[5] or a Type A or Type B certificate (*n* = 32).
- Based on certification records, teachers who were not issued a certificate between 2014/15 and 2017/18 but who were teaching with a Level 1 professional certificate or higher (Levels 2 and 3 professional certificates, Types A or B certificates) when they first appeared in the employment records, which indicates that they had attained a Level 1 professional certificate or higher prior to 2014/15 (*n* = 58).
- Based on certification records, teachers whose first certification issued between 2014/15 and 2017/18 was a certification type for which level of experience was indeterminate, including career, technical, trade, and industrial education certificates, out-of-state certificates, or out-of-field certificates (*n* = 17).
- Based on certification records, teachers who were not issued a certification between 2014/15 and 2017/18 but whose earliest known certification reported in the employment records was one of the certification types for which the level of experience is indeterminate (*n* = 7).
- Teachers who did not have a matching record in the certification or the employment records for all years provided to the research team. These teachers had identifiers in the study data, which meant that they were matched in the Louisiana Department of Education administrative records and thus likely had attained certification or taught outside of the date range available and were likely to be experienced teachers (*n* = 14).

The application of these exclusion criteria resulted in a sample of 336 early career Believe and Prepare pilot participants.

Where applicable, the study team applied additional criteria to construct the analytic samples for each research question (see figure B1 for a visual description of the samples):

- **Research question 1.** The sample included all 713 Believe and Prepare pilot participants. As described in the data preparation section, data on participant cohort, teacher preparation provider, teacher preparation subject, school, and district of residency were available for these 713 teachers.
- **Research question 2.** The sample for research question 2 included 268 participants who attained a Level 1 professional certificate. The sample for research question 2a included 336 participants (268 who attained a Level 1 professional certificate and 68 who did not).
- **Research question 3.** For research questions 3 and 3a, because the outcome of interest was entering teaching, the study team excluded 58 teachers who were already teaching in 2014/15.[6] The sample for research question 3 included 255 participants who entered teaching in Louisiana between 2015/16 and 2018/19. The

[5] Teachers can apply for a Level 2 professional certificate after teaching for a minimum of three years, and they can apply for a Level 3 professional certificate after teaching for five years and meeting other licensure requirements.

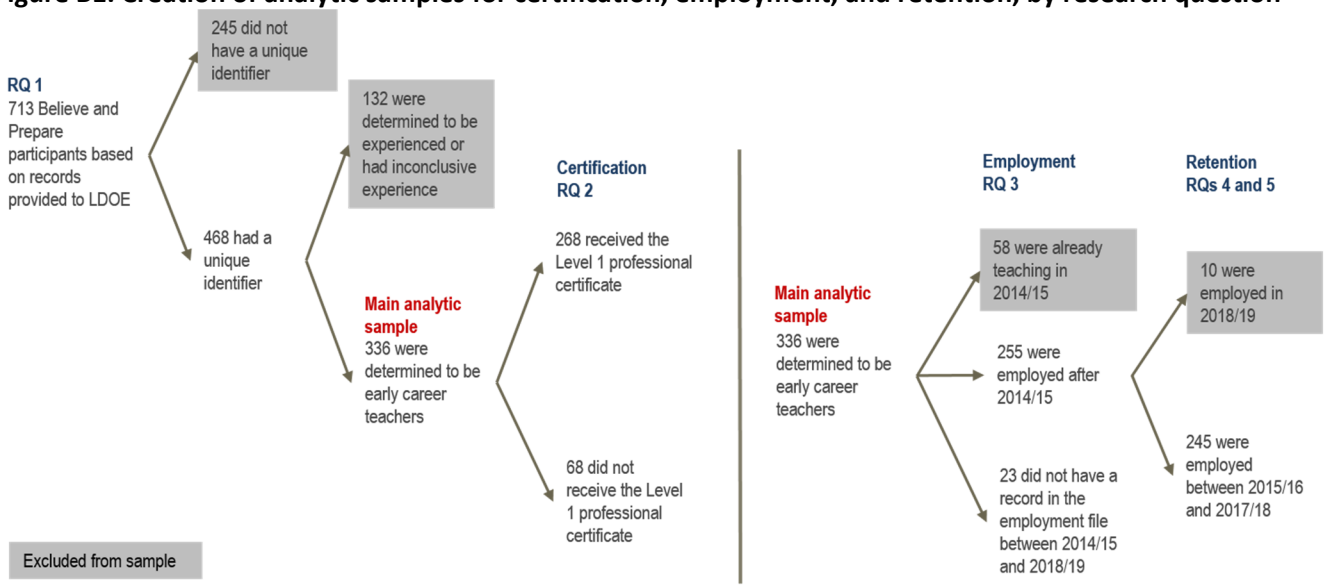
[6] The study team included these 58 participants in the sample of 336 participants because their certification status indicated that they were early career participants. That is, these participants were teaching with a practitioner license or did not receive their Level 1 professional certificate until after 2014/15. However, the study team excluded these teachers from the sample for research questions 3 and 3a because this question specifically addresses the outcome of entering employment after 2014/15. These 58 teachers were already teaching in 2014/15, and the study team could not determine whether they first taught in 2014/15 or in a prior year. Among the 58 participants, 44 were issued a practitioner license between 2014/15 and 2017/18, 6 were issued a Level 1 professional certificate after 2014/15, 6 were not issued any certification between 2014/15 and 2017/18 and had no certification in their earliest record in the employment data, and 2 were not issued any certification between 2014/15 and 2017/18. One participant held an ancillary certificate, and the other held a practitioner license in the earliest record of teaching.

sample for research question 3a included 278 participants (255 participants who entered teaching and 23 who did not).

- **Research questions 4 and 5.** The sample for analyses of retention included 245 early career Believe and Prepare teachers who gained employment in Louisiana public schools between 2015/16 and 2017/18. The study team arrived at the sample of 245 teachers by excluding the following participants from the pool of 336 early career Believe and Prepare pilot participants:
  - Participants who were already teaching in Louisiana public schools in 2014/15 (*n* = 58).
  - Participants who were not in the employment file between 2014/15 and 2018/19 (*n* = 23). Of these 23 participants, 5 were issued a practitioner license, and 18 were issued a Level 1 professional certificate between 2014/15 and 2017/18.
  - Participants whose first record in the employment file was for 2018/19 (*n* = 10). Because the employment file was limited to teaching records between 2014/15 and 2018/19, the study team did not have teaching records for 2019/20 to determine whether these 10 teachers returned to teaching in Louisiana public schools in the second year.

  The sample for research question 4b also included 10,275 other early career teachers in the state who did not participate in the Believe and Prepare pilot program. To identify the group of other early career teachers, the study team applied the same criteria used to identify the sample of early career Believe and Prepare teachers.

Figure B1. Creation of analytic samples for certification, employment, and retention, by research question



LDOE is Louisiana Department of Education. RQ is research question.
Source: Authors' compilation.

Data analysis

Research question 1: What types of teacher preparation programs did Believe and Prepare pilot participants attend? How did their residency districts and schools compare with other districts and schools in the state? The study team first calculated the number of distinct teacher preparation programs, districts of residency, and schools of residency. To examine the distribution of participants across programs, districts, and schools, the study team also calculated the number of Believe and Prepare pilot participants at each teacher preparation program and at each district and school of residency. The study team compared the characteristics of the districts and

schools that participated in the Believe and Prepare pilot with all districts and schools in the state. Group differences that were 5 percentage points or greater were considered meaningful.

Research question 2: In what subjects did early career Believe and Prepare pilot participants attain Level 1 professional certificates between 2015/16 and 2017/18? The percentage of participants who attained a Level 1 professional certificate in a particular subject was calculated as the number of participants who attained a Level 1 professional certificate in that subject divided by the number of teachers who attained a Level 1 professional certificate in any subject between 2015/16 and 2017/18 (*n* = 268). Because teachers could attain a certification in multiple subjects, percentages do not sum to 100 percent. The percentage of participants who attained at least one Level 1 professional certificate in a high-need subject was calculated as the number of participants with a Level 1 professional certificate in at least one high-need subject divided by the number of participants who attained a Level 1 professional certificate in any subject between 2015/16 and 2017/18. High-need subjects included middle grades math or science, secondary math or science, and special education, as defined by the Louisiana Department of Education.

Research question 2a: Was attainment of a Level 1 professional certificate associated with characteristics of the schools (enrollment, locale, type, charter school designation, and student demographics) in which participants taught during their residency? To identify the characteristics of pilot program participants and their school of residency that were associated with certification, the study team conducted regression analysis using multilevel logistic regression models with the following structure:

(B1) $$Logit(Y_{ijk}) = \beta_1 \boldsymbol{Cohort_i} + \beta_2 \mathbf{X_{ijk}} + \beta_3 \mathbf{W_{jk}} + u_k + \varepsilon_{ijk}$$

where

- Y_{ijk} is the probability of attaining a Level 1 professional certificate for teacher *i* in school *j* in district *k*. Individuals were assigned a 1 if they received a Level 1 professional certificate after 2014/15 and a 0 if they did not achieve that outcome.
- $\mathbf{X_{ijk}}$ is a vector of teacher covariates. Because teacher characteristics (race/ethnicity, gender, highest level of education) were available only in the employment dataset, these characteristics were not included in models for certification and employment.
- $\mathbf{W_{jk}}$ is a vector of school characteristics, including percentage of racial/ethnic minority students, percentage of English learner students, percentage of economically disadvantaged students, log of total enrollment, and binary variables indicating whether the school was a primary school, a charter school, or in an urban area. Characteristics of residency schools were used for analyses of certification and employment.
- u_k is a district random effect of residency districts, and ε_{ijk} is the individual error term. The study team used random instead of fixed district effects because the goal was to account for teacher clustering within districts (to obtain accurate standard errors), not to estimate the effect of each individual district.

For each model the study team estimated separate intercepts for each cohort to account for unmeasured differences in program implementation and timing of the cohorts.[7] The study team employed a backward variable selection approach that removed less significant covariates until the best possible (minimal) value of Akaike

[7] In considering whether to include both school and district characteristics, the study team observed a strong correlation between school and district characteristics, which could be explained by the small size and homogeneity of many districts. For a similar reason school and district random effects could not be identified simultaneously. The study team determined that the model with district-only random effects was adequate. Therefore, the models as reported included only teacher- and school-level fixed effects and only district-level random effects, as shown in model B1.

information criterion was achieved (Venables & Ripley, 2002). The goal was to find the best tradeoff between model complexity (the number of covariates) and the goodness-of-fit (explained variance). The selection process was implemented using a modification of R function "step()" adapted for generalized linear mixed models.

Research question 3: In what subjects did early career Believe and Prepare pilot participants teach in their first year of employment in Louisiana public schools between 2015/16 and 2018/19? The percentage of early career Believe and Prepare pilot participants who taught courses in a particular subject was calculated as the number of participants who entered teaching in Louisiana public schools between 2015/16 and 2018/19 and who taught a course in that subject divided by the total number of participants who entered teaching in Louisiana public schools between 2015/16 and 2018/19 (n = 255). Because participants could teach courses in multiple subjects, percentages do not sum to 100 percent. The percentage of participants who taught a course in at least one high-need subject was calculated as the number of participants who taught at least one course in a high-need subject divided by the total number of participants who entered teaching in Louisiana public schools between 2015/16 and 2018/19 (n = 255).

Research question 3a: Was entry into teaching associated with characteristics of the schools (enrollment, locale, type, charter school designation, and student demographics) in which participants taught during their residency? This research question was addressed using models similar to those for research question 2a. The outcome is the probability of entering teaching in Louisiana after 2014/15. In addition to characteristics of schools of residency, a binary variable was included to indicate whether the teacher received a Level 1 professional certificate after 2014/15.

Research question 4: What percentages of early career Believe and Prepare teachers overall and by subject were retained in teaching positions in the state, in the district, or in the school for a second year between 2016/17 and 2018/19? The study team calculated within-state, within-district, and within-school retention rates for early career Believe and Prepare pilot participants who entered teaching in Louisiana between 2015/16 and 2017/18 as the ratios of the following two quantities:

- Number of early career Believe and Prepare pilot participants who returned to teach in the state, district, or school in the second year of employment.
- Number of early career Believe and Prepare pilot participants who entered teaching in Louisiana between 2015/16 and 2017/18 (n = 245).

The study team calculated the distribution of first-year retention rates (in-state, in-district, and in-school) of early career Believe and Prepare participants who entered teaching in Louisiana between 2015/16 and 2017/18 by subjects taught in the first year of employment. Special attention was given to high-need subjects. The retention rate for each subject was calculated as the number of participants who taught that subject in their first year of teaching and returned to teach in the state, district, or school in the second year of employment (regardless of the subject taught in the second year) divided by the number of participants who taught that subject.

Research question 4a: Was retention associated with characteristics of teachers (gender, race/ethnicity, highest level of education, and whether they attained initial certification) and characteristics of schools (enrollment, locale, type, charter school designation, and student demographics) in which they were first employed? To identify the characteristics of early career Believe and Prepare pilot participants and their schools that were associated with retention (in state, in district, or in school), the study team conducted regression analysis using model B1 above, with the following modifications:

- Y_{ijk} is the probability of achieving an outcome of interest (retention in state, district, or school) for teacher i in school j in district k. For each outcome individuals were assigned a value of 1 if they returned to teaching in

the state, the same district, or the same school in the second year of employment and a value of 0 if they were in the sample for that outcome but did not return to teaching in the state, the same district, or the same school in the second year of employment.

- $\mathbf{X}_{ijk}$ is a vector of teacher covariates, including five binary variables to indicate whether the teacher was White, was female, had at least a master's degree, attained an initial certification after 2014/15, and was employed in the residency school in the first year of teaching.
- $\mathbf{W}_{jk}$ is a vector of characteristics of the teacher's first school of employment, including log of total enrollment, percentage of economically disadvantaged students, percentage of racial/ethnic minority students, percentage of English learner students, and binary variables indicating whether the school was a primary school, a charter school, or in an urban area.
- u_k is a district random effect of employment districts, and ε_{ijk} is the individual error term.

The study team applied the same approach of estimating separate intercepts for each cohort and employed the same variable selection process as described above for the analyses predicting certification and employment.

Research question 4b: How did the retention rates of early career Believe and Prepare teachers, teacher characteristics, and characteristics of the schools and districts in which they taught compare with those of other early career teachers in Louisiana? The study team compared early career Believe and Prepare pilot participants and other early career teachers in the state on retention rates and on several characteristics. For each retention outcome (in state, in district, or in school), the study team applied a chi-square test to determine whether a relationship existed between the outcome (retained or not) and preparation of early career teachers through the Believe and Prepare pilot program. For each teacher characteristic the study team also applied a chi-square test to determine whether the proportions of teachers across the different categories (for example, proportions of male teachers and female teachers) were similar between the group of early career teachers prepared through the Believe and Prepare pilot and the group of other early career teachers in Louisiana. The study team applied the two-sample *t*-test to assess the similarities across the two groups in total enrollment, percentages of economically disadvantaged students, percentages of racial/ethnic minority students, and percentages of English learner students in the district and school.

Research question 5: What percentages of early career Believe and Prepare teachers entered teaching in the districts and in the schools in which they served their residency? The study team calculated the percentages of early career Believe and Prepare teachers who entered teaching in the schools and districts in which they served their residency as ratios of the following two quantities:

- Number of teachers who were employed in the same school (or same district) as their residency school (or district).
- Number of early career Believe and Prepare pilot participants who entered teaching in Louisiana between 2015/16 and 2017/18 (n = 245).

Research question 5a: Did retention rates differ between participants who entered teaching at their school of residency and participants who entered teaching at another school? The study team conducted regression analyses using model B1 from research question 2a with an additional binary term indicating whether the teacher was employed in the same school in which residency was served. The sign of the regression coefficient (beta) for the binary term indicates whether being employed in the school of residency was positively or negatively associated with within-school retention (see model 1 in table C6 in appendix C). The standard error indicates whether the relationship was statistically significant.

Use of regression results

For research questions 2a, 3a, 4a and 5a the primary interest was to identify the sign and significance of various predictors. The regression results produced estimates of regression coefficients (betas) and standard errors that identified statistically significant predictors of outcomes. To facilitate interpretability, results for the main sample using the optimal models were reported as average marginal effects (see table C3 in appendix C). Average marginal effects, which were generated using the *margins* function of R's *margins* package (Leeper, 2018), can be interpreted as the increase in the probability of the outcome (in percentage points) given a one-unit increase in the predictor after other teacher and school characteristics were accounted for. For binary variables, such as charter or noncharter, the average marginal effect is the difference in the probability of the outcome for teachers teaching at charter schools compared with teachers teaching at noncharter schools, after other factors were adjusted for.

Sensitivity analysis

The study team conducted one sensitivity analysis to assess the stability of the main results for certification, employment, and retention outcomes by varying how the cohort variable was handled in the analysis. The main models estimated cohort to account for unmeasured differences in program implementation and timing of the cohorts. However, cohort 1 was a near-perfect predictor of the outcomes (that is, most of cohort 1 achieved the outcome). In the sensitivity analysis the study team limited the samples to cohorts 2 and 3 to assess whether and how regression coefficients were affected after cohort 1 was removed. The sensitivity analysis showed that the results were robust against the changes in model specifications and variations in the sample. All the variables that were significant in the main models had the same direction of association (the sign of regression coefficients) with the outcomes across all models. The strength of the association was comparable (same order of magnitude of coefficients) in all cases.

Supplemental analysis

The study team conducted supplemental analyses for research questions 2a (Was attainment of a Level 1 professional certificate associated with characteristics of the schools in which participants taught during their residency?) and 3a (Was entry into teaching associated with characteristics of the schools in which participants taught during their residency?) using an alternative sample that included the 245 Believe and Prepare pilot participants who were not matched to the administrative records of the Louisiana Department of Education (that is, participants without identifiers). These analyses were considered supplemental because of the uncertainty about why the Louisiana Department of Education was unable to match a fairly large percentage (34 percent) of Believe and Prepare participants with records in the Department's Profile of Education Personnel data. The supplemental analysis assumed that none of the 245 participants attained certification or entered teaching in Louisiana and that they were all early in their career. Their certification and employment outcomes were coded as 0 when they were included in the analysis. This approach resulted in a sample of 581 participants for research question 2a and a sample of 523 participants for research question 3a (58 participants who were already teaching in 2014/15 were excluded). The study team examined whether certification (research question 2a) and entering teaching (research question 3a) were associated with characteristics of schools of residency using the same models as those used for the main analyses. The results of the supplemental analyses are presented in appendix D.

References

Leeper, T. J. (2018). *Margins: Marginal effects for model objects* (R package version 0.3.23). Cloud.r Project. Retrieved September 29, 2020, from https://github.com/leeper/margins.

Louisiana Department of Education. (n.d.). *Recovery school district*. Retrieved September 28, 2020, from https://www.louisianabelieves.com/schools/recovery-school-district/.

National Center for Education Statistics. (2016). Common Core of Data. Public Elementary and Secondary School Universe Survey, 2014–15. U.S. Department of Education.

National Center for Education Statistics. (2017). National Center for Education Statistics. Common Core of Data. Public Elementary and Secondary School Universe Survey, 2015–16. U.S. Department of Education.

National Center for Education Statistics. (2018). National Center for Education Statistics. Common Core of Data. Public Elementary and Secondary School Universe Survey, 2016–17. U.S. Department of Education.

National Center for Education Statistics. (2019). National Center for Education Statistics. Common Core of Data. Public Elementary and Secondary School Universe Survey, 2017–18. U.S. Department of Education.

Venables, W. N., & Ripley, B. D. (2002). *Modern applied statistics with S* (4th ed.). Springer.

Appendix C. Supporting analysis

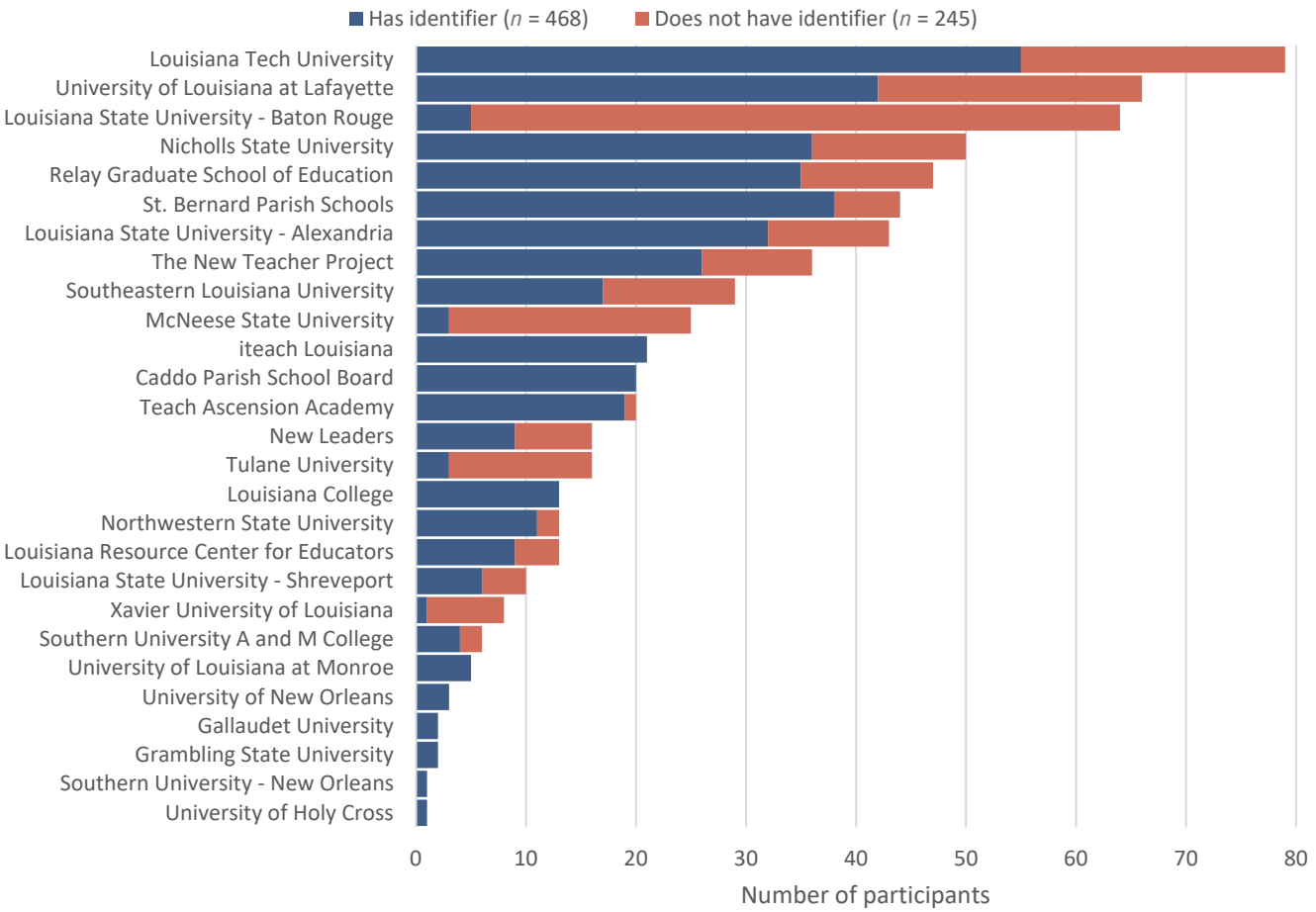
This appendix provides additional findings from the analyses, including comparisons of the composition of the districts and schools of residency of Believe and Prepare pilot participants and all districts and schools in the state, detailed regression results and sensitivity analyses for all outcomes, and comparisons of characteristics of Believe and Prepare pilot participants with identifiers and participants without identifiers.

Findings for all Believe and Prepare pilot participants

This section presents additional findings on the distribution of all 713 Believe and Prepare pilot participants between 2014/15 and 2016/17 by teacher preparation program and district and school of residency, as well as by the characteristics of their districts and schools of residency.

Believe and Prepare pilot participants were enrolled in 27 teacher preparation programs (figure C1) and taught in 45 districts (figure C2) and 217 schools during residency. Compared with all districts in the state, Believe and Prepare pilot participants' districts of residency had a higher average percentage of economically disadvantaged students (table C1). Compared with all schools in the state, Believe and Prepare pilot participants' schools of residency had a higher average percentage of racial/ethnic minority students (table C2) and consisted of a higher percentage of city schools and charter schools (figure C3).

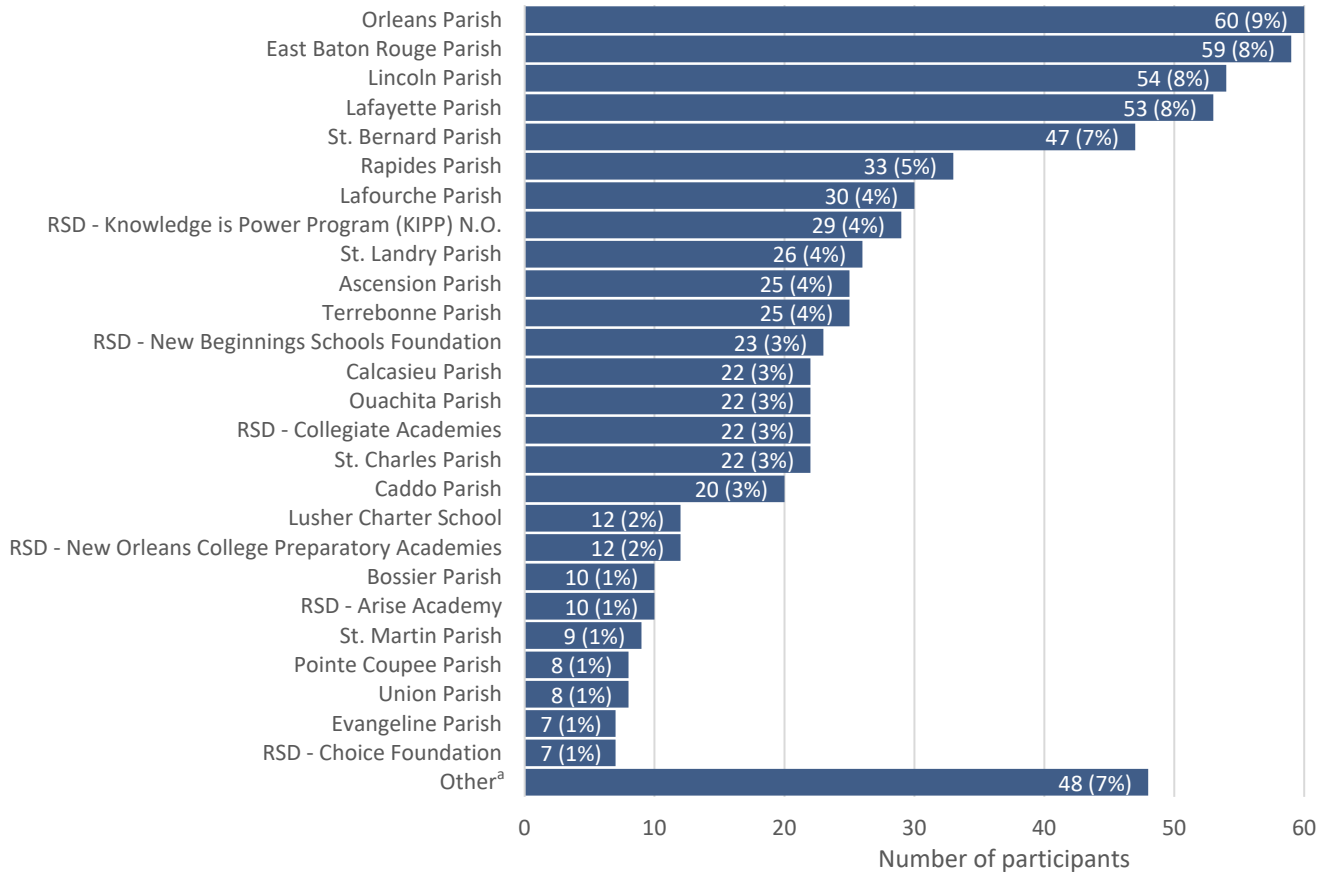
Figure C1. Believe and Prepare pilot participants were enrolled in 27 teacher preparation programs, with nearly half of participants enrolled in the top 5 programs, 2014/15–2016/17



Note: Among the 713 pilot participants in the Believe and Prepare program records, the Louisiana Department of Education could not match 245 participants (34 percent) to its employment records. Those participants were therefore not assigned an identifier and were not included in the analysis of certification or employment outcomes.

Source: Authors' analysis of data from the Believe and Prepare Pilot Participants dataset provided by the Louisiana Department of Education.

Figure C2. Believe and Prepare pilot participants served a residency in 45 school districts, with 40 percent of participants completing their residency in the top 5 districts, 2014/15–2016/17



Note: *n* = 703.
a. The 19 residency districts that had five or fewer participants.
Source: Authors' analysis of data provided by the Louisiana Department of Education.

Table C1. The student composition characteristics of Believe and Prepare pilot districts of residency and of all districts in the state, 2014/15–2016/17

	Believe and Prepare pilot districts of residency (*n* = 43)			All districts in the state (*n* = 81)		
District characteristic	Mean	Standard deviation	Median	Mean	Standard deviation	Median
Total enrollment	9,914	10,891	5,221	8,922	11,511	4,337
Percentage of economically disadvantaged students	74.45	13.79	73.72	69.31	15.68	71.46
Percentage of racial/ethnic minority students	54.81	23.67	51.68	54.44	22.73	52.67
Percentage of English learner students	2.43	2.50	1.57	1.59	2.22	0.86

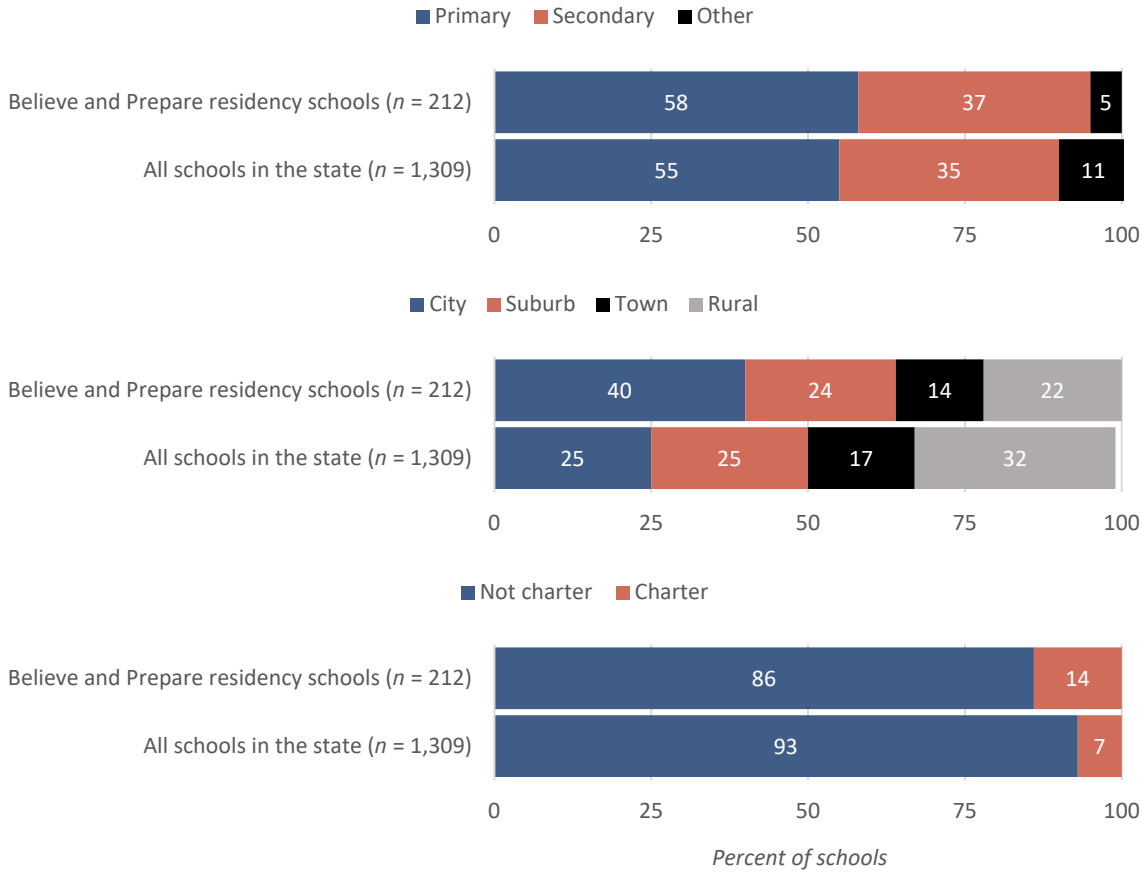
Note: State means were calculated using 2017/18 data.
Source: Authors' analysis of data provided by the Louisiana Department of Education and data obtained from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center)

Table C2. The student composition characteristics of Believe and Prepare pilot schools of residency and of all schools in the state, 2014/15–2016/17

School characteristic	Believe and Prepare pilot schools of residency (*n* = 217)			All schools in the state (*n* = 1,409)		
	Mean	Standard deviation	Median	Mean	Standard deviation	Median
Total enrollment	643	385	546	529	328	456
Percentage of economically disadvantaged students	75.49	17.02	78.57	71.97	18.16	75.10
Percentage of racial/ethnic minority students	66.64	27.99	69.72	59.47	30.95	59.27
Percentage of English learner students	3.02	4.90	1.17	3.23	6.22	0.98

Note: State means were calculated using 2017/18 data.
Source: Authors' analysis of data provided by the Louisiana Department of Education and data obtained from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center).

Figure C3. Other characteristics of Believe and Prepare pilot schools of residency differed, on average, from that of all schools in the state in grade level, locale, and charter school designation status, 2014/15–2016/17



Note: Percentages might not sum to 100 because of rounding.
Source: Authors' analysis of data provided by the Louisiana Department of Education and data obtained from National Center for Education Statistics (2016, 2017, 2018, 2019).

Findings for early career Believe and Prepare pilot participants with certification or employment records

This section presents additional findings related to certification, employment, and retention for the 336 participants who met the study criteria for early career teachers or teacher candidates during the Believe and Prepare pilot, the primary group of interest to the Louisiana Department of Education.

Findings from regressions on certification, employment, and retention for early career Believe and Prepare pilot participants. The study found statistically significant predicators for four of the five outcomes examined (tables C3–C6).

Table C3. Predictors of certification and of retention outcomes in the school, district, or state for early career Believe and Prepare pilot participants, 2015/16–2018/19

Outcome and predictor	Estimate	Average marginal effect	Standard error
Certification (characteristics of residency school)			
Residency school—charter	–1.54**	–24.20	0.48
Residency school—primary	0.89*	11.06	0.37
Retention in school (characteristics of employment school)			
Percentage of economically disadvantaged students	0.05**	0.81	0.02
Percentage of racial/ethnic minority students	–0.05***	–0.90	0.01
Retention in district (characteristics of employment school)			
Percentage of economically disadvantaged students	0.05**	0.79	0.02
Percentage of racial/ethnic minority students	–0.05***	–0.72	0.01
Is a primary school	–0.73*	–11.21	0.37
Retention in state (characteristic of employment school)			
Received a Level 1 professional certificate	1.11*	12.58	0.47

* Significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
Note: The table shows results only for predictors that are significant. There were no significant predictors for employment. Estimates are unstandardized coefficients.
Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and from National Center for Education Statistics (2016, 2017, 2018, 2019).

Table C4. Regression results for predictors of attainment of Level 1 professional certificates for early career Believe and Prepare pilot participants, 2014/15–2017/18

Predictor	Model 1	Model 1a
Cohort 1	0.02	–0.75
	(3.45)	(2.80)
Cohort 2	0.03	–0.75
	(3.23)	(2.51)
Cohort 3	–0.36	–1.14
	(3.23)	(2.52)
Log (total enrollment in residency school)	0.48	0.54
	(0.39)	(0.35)
Percentage of economically disadvantaged students in residency school	–0.01	na
	(0.03)	
Percentage of racial/ethnic minority students in residency school	–0.01	–0.01
	(0.02)	(0.01)
Percentage of English learner students in residency school	0.00	na
	(0.05)	
Residency school is a primary school	0.94*	0.89*
	(0.40)	(0.37)
Residency school is in an urban area	–0.05	na
	(0.50)	
Residency school is a charter school	–1.58**	–1.54**
	(0.59)	(0.49)
Akaike information criterion	264.20	258.38
Bayesian information criterion	305.34	288.29
Log likelihood	–121.10	–121.19
Number of observations	311	311
Number of groups: Residency district identifier	36	36
Variable: Residency district identifier (intercept)	0.22	0.23

* Significant at $p < .05$; ** significant at $p < .01$.
na indicates that the variable was removed during the variable selection process.
Note: Estimates are unstandardized coefficients. Values in parentheses are standard errors. Model 1 includes all available covariates. Model 1a is the resulting model after applying the variable selection approach that removed less significant covariates until the best possible (minimal) value of Akaike information criterion was achieved.
Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and from National Center for Education Statistics (2016, 2017, 2018, 2019).

Table C5. Regression results for predictors of entering teaching in Louisiana for early career Believe and Prepare pilot participants, 2014/15–2018/19

Predictor	Model 1	Model 1a
Cohort 1	13.78	19.27
	(1,414.00)	(1,436.07)
Cohort 2	–2.46	2.75***
	(5.14)	(0.44)
Cohort 3	–2.18	3.17***
	(5.16)	(0.54)
Teacher received Level 1 professional certificate	–1.54	na
	(1.12)	
Log (total enrollment)	0.94	na
	(0.67)	
Percentage of economically disadvantaged students in residency school	0.02	na
	(0.04)	
Percentage of racial/ethnic minority students in residency school	–0.01	na
	(0.03)	
Percentage of English learner students in residency school	–0.08†	–0.07†
	(0.04)	(0.04)
Residency school is a primary school	–0.12	na
	(0.68)	
Residency school is in an urban area	–0.11	na
	(0.89)	
Residency school is a charter school	–0.42	na
	(1.09)	
Akaike information criterion	162.33	153.38
Bayesian information criterion	205.47	171.45
Log likelihood	–69.17	–71.69
Number of observations	269	274
Number of groups: Residency district identifier	36	37
Variable: Residency district identifier (intercept)	1.06	1.58

† Significant at $p < .10$; *** significant at $p < .001$.
na indicates that the variable was removed during the variable selection process.
Note: Estimates are unstandardized coefficients. Values in parentheses are standard errors. Model 1 includes all available covariates. Model 1a is the resulting model after applying the variable selection approach that removed less significant covariates until the best possible (minimal) value of Akaike information criterion was achieved.
Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and from National Center for Education Statistics (2016, 2017, 2018, 2019).

Table C6. Regression results for predictors of retention in the school, district, or state in the second year of teaching for early career Believe and Prepare teachers, 2015/16–2018/19

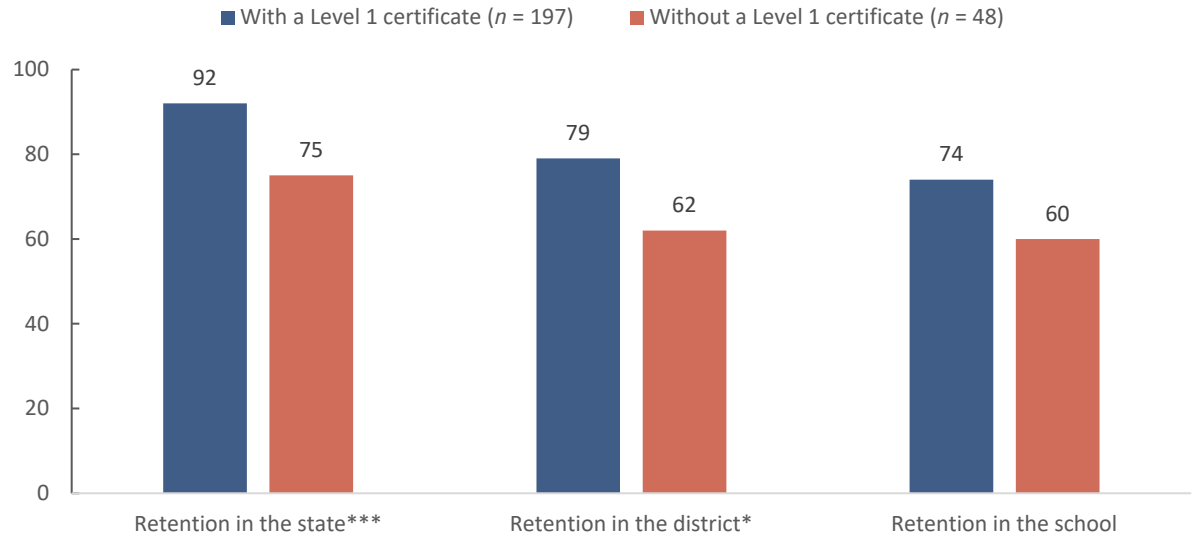
	Retention in school		Retention in district		Retention in state	
Predictor	Model 1	Model 1a	Model 1	Model 1a	Model 1	Model 1a
Cohort 1	–1.35	1.42	–1.76	0.18	21.62	0.96
	(2.85)	(1.15)	(3.33)	(1.25)	(2,301.23)	(1.19)
Cohort 2	–1.14	1.44	–1.16	0.99	6.08	1.54**
	(2.69)	(0.87)	(3.16)	(0.98)	(3.97)	(0.51)
Cohort 3	–1.17	1.36	–1.56	0.74	6.40	1.88**
	(2.70)	(0.89)	(3.15)	(1.00)	(3.97)	(0.58)
Teacher received Level 1 professional certificate	0.30	na	0.60	0.66	1.31*	1.11*
	(0.44)		(0.47)	(0.43)	(0.54)	(0.47)
Teacher is White	–0.69	–0.55	–0.49	–0.49	–0.46	na
	(0.42)	(0.38)	(0.45)	(0.42)	(0.58)	
Teacher is female	0.17	na	0.42	na	0.43	na
	(0.46)		(0.50)		(0.59)	
Teacher has higher than a bachelor's degree	–0.22	na	0.10	na	0.48	na
	(0.47)		(0.52)		(0.70)	
Same residency and employment school	0.47	0.41	0.04	na	–0.35	na
	(0.35)	(0.34)	(0.39)		(0.50)	
Log (total enrollment in employment school)	0.33	na	0.24	na	–0.53	na
	(0.34)		(0.41)		(0.49)	
Percentage of economically disadvantaged students in employment school	0.04*	0.05**	0.06**	0.05**	–0.01	na
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	
Percentage of racial/ethnic minority students in employment school	–0.04**	–0.05***	–0.05**	–0.05***	–0.01	na
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	
Percentage of English learner student in employment school	–0.01	na	0.01	na	0.04	na
	(0.04)		(0.05)		(0.06)	
Employment school is a primary school	–0.45	–0.44	–0.87*	–0.73*	–0.56	na
	(0.35)	(0.33)	(0.41)	(0.37)	(0.52)	
Employment school is in an urban area	–0.39	na	0.63	na	–0.51	–0.76†
	(0.45)		(0.56)		(0.69)	(0.46)
Employment school is a charter school	–0.02	na	–0.96	na	–0.09	na
	(0.52)		(0.67)		(0.70)	
Akaike information criterion	276.13	265.28	252.73	245.27	171.89	164.40
Bayesian information criterion	331.28	296.30	307.88	276.41	227.04	185.29
Log likelihood	–122.07	–123.64	–110.37	–113.64	–69.95	–76.20
Number of observations	232	232	232	235	232	240
Number of groups: Employment residency identifier	49	49	49	51	49	51
Variable: Employment residency identifier (intercept)	0.01	0.00	0.36	0.21	0.00	0.00

† Significant at $p < .10$; * significant at $p < .05$; ** significant at $p < .01$; *** significant at $p < .001$.
na indicates that the variable was removed during the variable selection process.
Note: Estimates are unstandardized coefficients. The values in parentheses are standard errors. Model 1 includes all available covariates. Model 1a is the resulting model after applying the variable selection approach that removed less significant covariates until the best possible (minimal) value of Akaike information criterion was achieved.
Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and from National Center for Education Statistics (2016, 2017, 2018, 2019).

Comparison of retention rates for early career Believe and Prepare teachers and other early career teachers in the state. Among the samples of early career Believe and Prepare teachers and other early career teachers, teachers who attained a Level 1 professional certificate had higher retention rates than those who did not (figures C4 and C5).[9] The study team conducted additional analysis comparing the subsample of teachers who attained a Level 1 professional certificate after 2014/15 and the subsample of teachers who did not. The differences in retention rates between early career Believe and Prepare teachers and other early career teachers for these two subsamples were not statistically significant (figures C6 and C7).

Figure C4. Among early career Believe and Prepare teachers, those who attained a Level 1 professional certificate between 2015/16 and 2017/18 had significantly higher within-state and within-district retention rates than those who did not

Percent of teachers

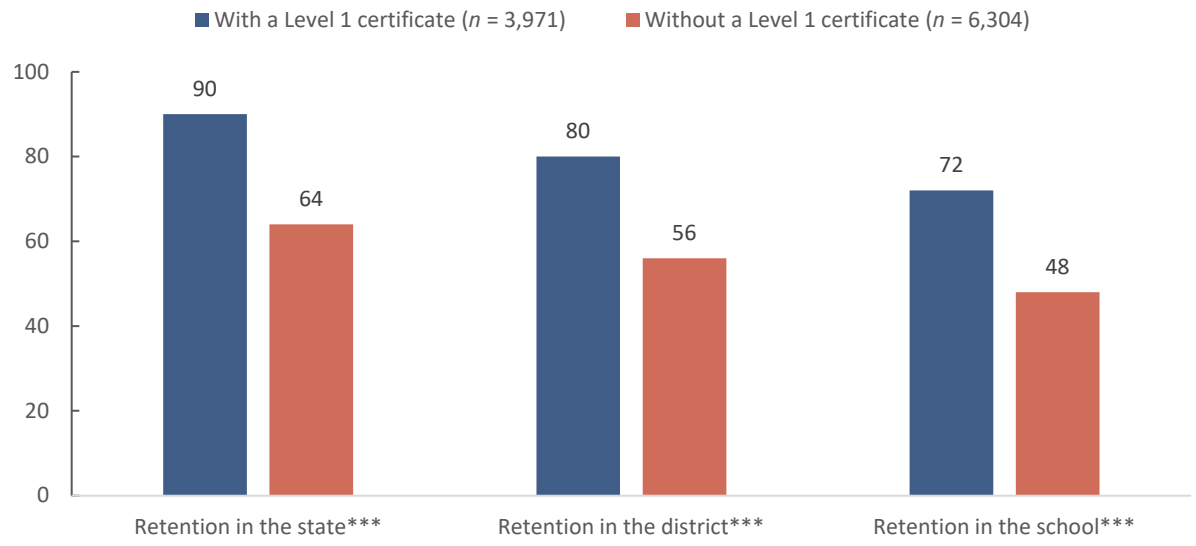


* Significant at $p < .05$; *** significant at $p < .001$.
Source: Authors' analysis of data provided by the Louisiana Department of Education.

[9] Forty-eight early career Believe and Prepare teachers did not attain a Level 1 professional certificate between 2015/16 and 2017/18. Among them, 22 teachers (46 percent) attained a practitioner license, and 26 teachers (54 percent) did not attain any certificate between 2014/15 and 2017/18. Of those 26 teachers, 23 (88 percent) did not have a certificate associated with their teaching record between 2014/15 and 2018/19, and 3 (12 percent) had an ancillary certificate or a temporary-authority-to-teach associated with their earliest teaching records. Among the 6,304 other early career teachers in the state who did not attain a Level 1 professional certificate between 2014/15 and 2017/18, 1,345 (21 percent) attained a practitioner license, and 4,959 (79 percent) were not issued any certificate between 2014/15 and 2017/18. Of those 4,959 teachers, 3,626 (73 percent) teachers had no certification associated with any of their teaching records between 2014/15 and 2018/19. The remaining 1,333 (27 percent) teachers had a certificate associated with their teaching record in one or more years (that is, they attained the certificate prior to 2014/15 or after 2017/18). Among the 1,333 teachers, 667 (50 percent) were teaching with a temporary-authority-to-teach certificate, 499 (37 percent) were teaching with an ancillary certificate, 106 (8 percent) were teaching with a practitioner license, and 61 (5 percent) were teaching with a professional certificate attained after 2017/18.

Figure C5. Among other early career teachers in the state, those who attained a Level 1 professional certificate between 2015/16 and 2017/18 had significantly higher within-state, within-district, and within-school retention rates than those who did not

Percent of teachers

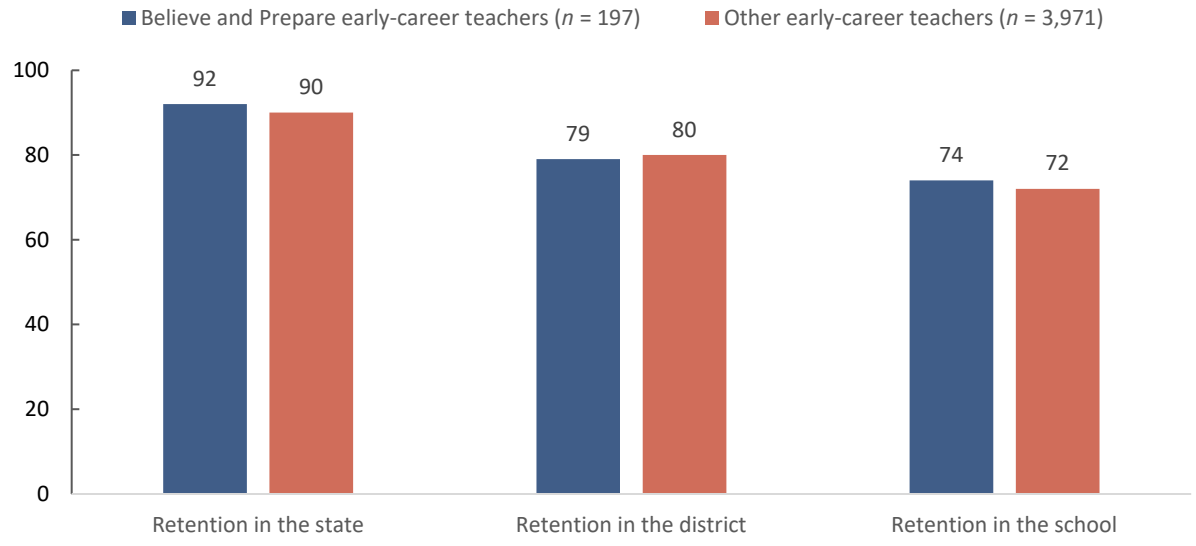


*** Significant at $p < .001$

Source: Authors' analysis of data provided by the Louisiana Department of Education.

Figure C6. Among all teachers who attained a Level 1 professional certificate in the state between 2015/16 and 2017/18, retention rates into the second year of teaching did not differ significantly between early career Believe and Prepare teachers and other early career teachers

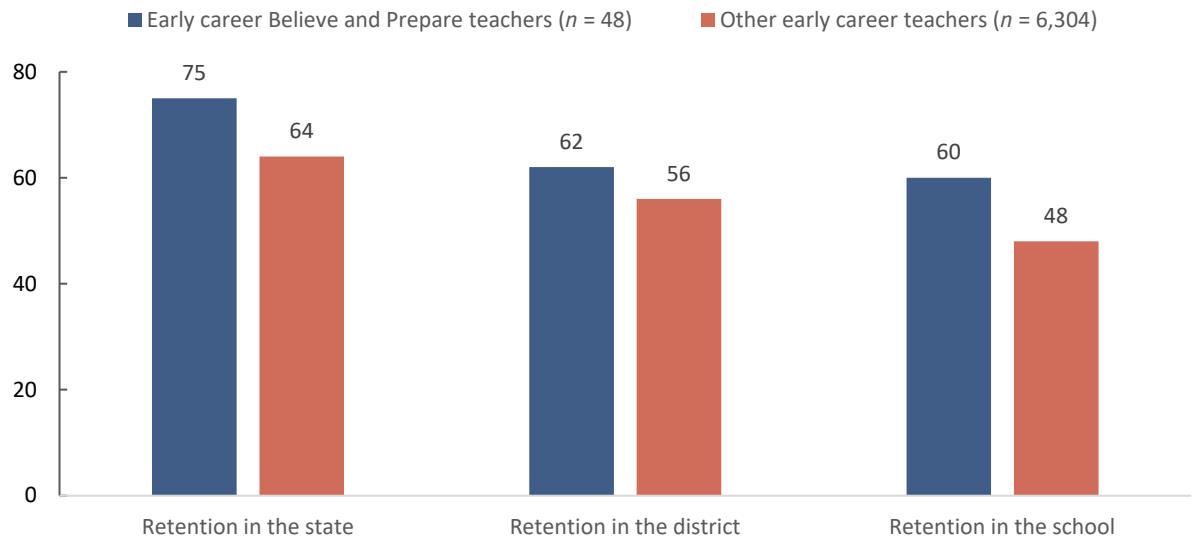
Percent of teachers



Source: Authors' analysis of data provided by the Louisiana Department of Education.

Figure C7. Among all teachers who did not attain a Level 1 professional certificate in the state between 2015/16 and 2017/18, retention rates into the second year of teaching did not differ significantly between early career Believe and Prepare teachers and other early career teachers

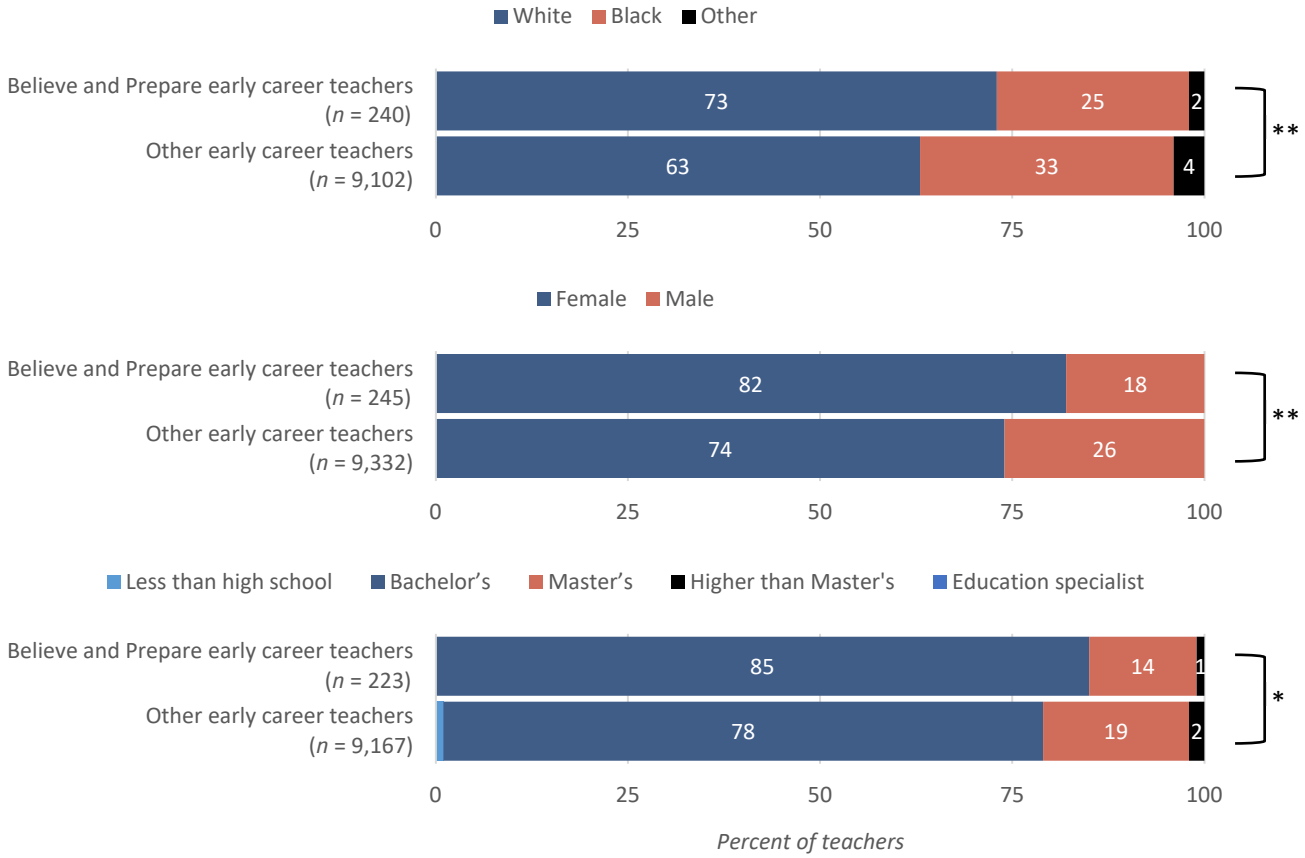
Percent of teachers



Source: Authors' analysis of data provided by the Louisiana Department of Education.

Comparison of teacher characteristics and characteristics of employment districts and schools for early career Believe and Prepare teachers and other early career teachers in the state. The characteristics of early career Believe and Prepare teachers differed from the characteristics of other early career teachers who did not participate in the Believe and Prepare pilot program (figure C8). For the samples of teachers who attained a Level 1 certificate, there were no significant differences between early career Believe and Prepare teachers and other early career teachers (table C7). The characteristics of districts and schools in which early career Believe and Prepare teachers were first employed differed significantly from the characteristics of schools and districts in which other early career teachers were first employed (tables C8 and C9).

Figure C8. Characteristics (race/ethnicity, gender, and level of education) of early career Believe and Prepare teachers differed from those of other early career teachers in the state, 2015/16–2017/18



* Significant at $p < .05$; ** significant at $p < .01$.

Note: Chi-square tests of the characteristics of early career Believe and Prepare teachers and other teachers in the state result in p values of .004 for race/ethnicity, .005 for gender, and .036 for level of education.

Source: Authors' analysis of data provided by the Louisiana Department of Education.

Table C7. Characteristics of early career Believe and Prepare teachers and other early career teachers in the state who attained a Level 1 professional certificate, 2015/16–2017/18

Teacher characteristic	Early career Believe and Prepare teachers with Level 1 certificate		Other early career teachers with Level 1 certificate	
	Number	Percent	Number	Percent
Race/ethnicity				
Black	36	18.56	557	14.3
White	154	79.38	3,190	81.92
Other	4	2.06	147	3.78
Total	194	100	3,894	100
Highest level of education				
Bachelor's degree	169	85.80	3110	78.67
Education specialist	0	0	4	0.1
Higher than master's degree	[a]	[a]	82	2.07
Master's degree	26	13.33	757	19.15
Total	195	100.0	3,953	100.0
Gender				
Female	166	84.26	3,279	82.87
Male	31	15.74	678	17.13
Total	197	100	3,957	100

Note: Chi-square tests of the compositions of early career Believe and Prepare participants and other teachers in the state who attained the Level 1 professional certificates resulted in *p*-values of .141 for race/ethnicity, .680 for gender, and .113 for level of education.
a. Too low to report.
Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center) and from National Center for Education Statistics (2016, 2017, 2018, 2019).

Table C8. Characteristics of schools in which early career Believe and Prepare teachers and other early career teachers in the state were first employed, 2015/16–2017/18

	Early career Believe and Prepare teachers (*n* = 167 schools)			Other early career teachers (*n* = 1,322 schools)			
School characteristic	Mean	Standard deviation	Median	Mean	Standard deviation	Median	*p*-value
Total enrollment	629	355	567	536	328	466	.001
Percentage of economically disadvantaged students	76.46	17.90	79.48	73.63	18.21	76.75	.056
Percentage of racial/ethnic minority students	65.21	26.90	66.39	59.54	30.54	59.37	.012
Percentage of English learner students	2.27	3.64	1.05	3.15	6.04	0.99	.008

Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center).

Table C9. Characteristics of districts in which early career Believe and Prepare teachers and other early career teachers in the state were first employed, 2015/16–2017/18

	Early career Believe and Prepare teachers (*n* = 52 districts)			Other early career teachers (*n* = 148 districts)			
District characteristic	Mean	Standard deviation	Median	Mean	Standard deviation	Median	*p*-value
Total enrollment	10,167	11,553	5,962	4,873	8,762	1,302	.004
Percentage of economically disadvantaged students	74.34	12.79	75.61	76.31	17.63	79.35	.391
Percentage of racial/ethnic minority students	54.46	22.34	52.28	63.17	28.55	61.16	.027
Percentage of English learner students	2.24	2.64	1.40	1.56	2.33	0.58	.101

Note: The number of districts reported by the Louisiana Department of Education varied over the study years. The data used to calculate the characteristics of districts for the sample of other early career teachers in the state were extracted across several years.
Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center).

Analyses exploring the similarities between residency and employment schools and the relationship of similarities to retention of early career Believe and Prepare pilot participants. For Believe and Prepare pilot participants whose employment school in their first year of teaching was not their school of residency, neither retention nor the characteristics of schools of employment and residency differed significantly (tables C10 and C11).

Table C10. Comparison of retention rates between early career Believe and Prepare teachers who gained employment in their school of residency and those who gained employment in another school, 2015/16–2017/18

	First employment school is residency school				
	No (*n* = 102)		Yes (*n* = 140)		
Retention	Number	Percent	Number	Percent	*p*-value
In the state	92	90	123	88	.716
In the district	75	74	109	78	.531
In the school	67	66	105	75	.152

Source: Author's analysis of data provided by the Louisiana Department of Education.

Table C11. Characteristics of residency and employment schools of early career Believe and Prepare teachers who gained employment in schools that were not their school of residency, 2015/16–2018/19

	Residency schools (*n* = 56)	Employment schools (*n* = 87)		
School characteristic	Mean	Mean	*t*-statistic	*p*-value
Total enrollment	698	682	.20	.84
Percentage of economically disadvantaged students	77.43	72.44	1.51	.14
Percentage of racial/ethnic minority students	67.51	60.70	1.50	.14
Percentage of English learner students	3.75	2.50	1.33	.19

Source: Authors' analysis of data provided by the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center).

Characteristics of Believe and Prepare pilot participants with and without identifiers

This section reports on comparisons of the 468 Believe and Prepare pilot participants with identifiers and the 245 participants without identifiers. The study team had data on cohort, teacher preparation programs, subject in the teacher preparation program, and residency district and school identifiers for each of these two groups.

Believe and Prepare pilot participants without identifiers were distributed across multiple teacher preparation program providers (see figure C1). However, four programs had a disproportionately higher number of teachers without identifiers: Louisiana State University–Baton Rouge, McNeese State University, Xavier University, and Tulane University.

Believe and Prepare pilot participants with identifiers and those without identifiers differed by pilot cohort and teacher preparation program subject (tables C12 and C13). Participants without identifiers were primarily from cohort 3 (79 percent). There were no statistically significant differences in the characteristics of the residency schools and districts of Believe and Prepare pilot participants with identifiers and those without identifiers (tables C14 and C15).

Table C12. Number and percentage of Believe and Prepare pilot participants with identifiers and those without identifiers, by cohort, 2014/15–2016/17

	With identifier (*n* = 468 participants)		Without identifier (*n* = 245 participants)	
Cohort	Number	Percent	Number	Percent
1	38	8	26	11
2	221	47	25	10
3	209	45	194	79

Note: A chi-square test of the characteristics of the two groups resulted in a *p*-value of < .001, indicating that the distribution of participants across cohorts differed between the two groups.
Source: Author's analysis of data from the Louisiana Department of Education

Table C13. Number and percentage of Believe and Prepare pilot participants with identifiers and those without identifiers, by teacher preparation program subject, 2014/15–2016/17

	With identifier (*n* = 408 participants)		Without identifier (*n* = 105 participants)	
Subject	Number	Percent	Number	Percent
English language arts	46	11	38	36
Elementary	186	46	53	50
Math	35	9	0	0
Other	30	7	3	3
Science	27	7	0	0
Social studies	18	4	2	2
Special education	38	9	9	9
Subject specific—other	28	7	0	0

Note: Data on teacher preparation program subject were missing in 140 records without identifiers and 60 records with identifiers. A chi-square test of the characteristics of the two groups resulted in *p*-value of < .001, indicating that the distribution of subjects differed between the two groups.
Source: Author's analysis of data from the Louisiana Department of Education.

Table C14. Characteristics of schools of residency for Believe and Prepare participants with identifiers and those without identifiers, 2014/15–2016/17

Characteristic of residency schools	With identifier (*n* = 181 schools) Mean	With identifier (*n* = 181 schools) Standard deviation	Without identifier (*n* = 89 schools) Mean	Without identifier (*n* = 89 schools) Standard deviation	*p*-value
Total enrollment	653	393	724	439	.20
Percentage of economically disadvantaged students	77.64	16.81	77.00	18.38	.78
Percentage of racial/ethnic minority students	64.53	28.52	68.37	28.91	.30
Percentage of English learner students	2.45	4.23	3.30	5.20	.18

Note: The *p*-values indicate the level of statistical significance of the difference between the two groups for each school characteristic.
Source: Author's analysis of data from the Louisiana Department of Education and publicly available data from the department's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center).

Table C15. Characteristics of districts of residency for Believe and Prepare participants with identifiers and those without identifiers, 2014/15–2016/17

Characteristic of residency district	With identifier (*n* = 38 districts) Mean	With identifier (*n* = 38 districts) Standard deviation	Without identifier (*n* = 28 districts) Mean	Without identifier (*n* = 28 districts) Standard deviation	*p*-value
Total enrollment	10,837	11,296	11,646	10,995	.77
Percentage of economically disadvantaged students	75.05	12.95	74.21	14.60	.81
Percentage of racial/ethnic minority students	54.91	21.19	49.86	21.81	.35
Percentage of English learner students	2.14	2.22	2.75	2.68	.33

Note: The *p*-values indicate the level of statistical significance of the difference between the two groups for each district characteristic.
Source: Author's analysis of data from the Louisiana Department of Education and publicly available data from the Louisiana Department of Education's Data Center webpage (https://www.louisianabelieves.com/resources/library/data-center).

Appendix D. Other analyses

This appendix provides findings from the supplemental analysis that explored the associations between the attainment of a Level 1 professional certificate and characteristics of schools of residency (research question 2a) and the associations between entering teaching and characteristics of schools of residency (research question 3a) when the 245 Believe and Prepare pilot participants without identifiers were included in the analysis. The supplemental analyses assumed that the 245 participants did not attain certification and did not teach in Louisiana and that they were all early in their career. The results are largely consistent with those from the main analysis.

Findings on certification

Among the sample of 581 early career Believe and Prepare pilot participants that included the 245 records without identifiers, 268 participants attained a Level 1 professional certificate between 2015/16 and 2017/18.[10] Only one characteristic of the schools of residency was associated with the probability of early career Believe and Prepare pilot participants attaining a Level 1 professional certificate, after other school characteristics were controlled for. Participants who served their residency in a charter school had a lower probability (by 22 percentage points) of attaining the certificate than those who served their residency in a noncharter school. For comparison, analyses based on the main analytic sample (presented in the report) found differences in the probability of certification for participants who served their residency in a primary school as well as for participants who served their residency in a charter school. Participants who served a residency in a primary school had a higher probability (by 11 percentage points) of attaining the certificate than those who served their residency in a nonprimary school, and participants who served a residency in a charter school had a lower probability (by 24 percentage points) of attaining the certificate than those who served a residency in a noncharter school.

Findings on employment

Among the sample of 581 early career Believe and Prepare pilot participants that included the 245 records without identifiers, the 58 participants who were already teaching in Louisiana in 2014/15 were not included in the analysis for employment outcomes. Among the remaining 523 participants, 255 entered teaching in a Louisiana public school between 2015/16 and 2018/19.[11] Teachers who attained a Level 1 professional certificate were more likely to enter teaching in the state than teachers who had not attained the certificate (by 64 percentage points), after school characteristics were adjusted for. None of the characteristics of residency schools were associated with entering teaching. For comparison, analyses based on the main analytic sample found that none of the predictors examined—neither attainment of a Level 1 professional certificate nor any of the school characteristics—were associated with entering teaching.

[10] Participants who attained a Level 1 professional certificate between 2015/16 and 2017/18 made up 46 percent of the sample for the supplemental analysis that included the 245 participants without identifiers and 80 percent of the sample for the main analysis (a total of 336 participants) that excluded those 245 participants.

[11] Participants who entered teaching accounted for 49 percent of the sample for the supplemental analysis that included the 245 participants without identifiers, and 92 percent of the sample for the main analysis (a total of 278 participants) that excluded those 245 participants.