

The Impact of Teacher Licensure on Student Outcomes: Evidence from Illinois Education Teacher Performance Assessment (EdTPA)

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About the Author

Bobby Chung is a postdoctoral research associate at the School of Labor and Employment Relations at the University of Illinois (Urbana-Champaign). He is also a network member of the Human Capital and Economic Opportunity Global Working Group. His recent work includes social network, occupational licensing, and kidney-exchange network.

Executive Summary

In 2015 Illinois mandated the education Teacher Performance Assessment (edTPA), a performance-based assessment to evaluate teaching readiness, as a part of the teacher licensure requirements. The new requirement aimed to benefit student learning by improving the teaching effectiveness of prospective teachers. This report estimates the effect of teachers hired after 2015 when edTPA was implemented on student test scores. We analyze the mathematics and reading scores of 4th and 8th graders documented in the National Assessment of Educational Progress (NAEP) from 2009 to 2017.

Student Scores, 2009-2017:

- On average for the period examined, black students scored 16 points lower on mathematics and 15-18 points lower on reading tests compared to white students.
- On average for the period examined, female students scored 15 points lower on the mathematics test but performed 4-7 points better on the reading test compared to male students.

The Effect of edTPA on Students:

- EdTPA had no statistically significant impacts on fourth-graders in both mathematics and reading scores.
- EdTPA was associated with a 4.3-point decrease in the reading score of eighth-graders.
- The magnitude is small (one-tenth of the standard deviation of the score), but the effect size is statistically significant.

Two Possible Reasons for the Negative Effect:

- After 2015, new teachers in Illinois were less likely to have an advanced degree (a Master degree or higher).
- New teachers put less emphasis on “exposition” when they teach language classes.

EdTPA did not appear to promote student academic success in Illinois. Therefore, we recommend that the Illinois State Board of Education reconsider the role of edTPA in the teacher licensure system.

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Introduction

The education Teacher Performance Assessment (edTPA), a performance-based examination to evaluate teaching readiness, has gained popularity across the nation. As of 2019, edTPA became a mandatory testing component for initial teacher licensure in eleven states, including Illinois in 2015. Different from the traditional one-time written examination, edTPA is a semester-long project involving lesson plans, classroom videos, and detailed reports. It aims to develop better teaching practices through a performance-based student-teaching assessment. The ultimate goal of edTPA is to bolster the academic performance of PreK-12 students by enhancing teaching quality. Thus, knowing edTPA's benefit to student learning is vital to informing policymakers of whether it is an effective component of teacher licensure.

In the empirical analysis, we analyzed the restricted data of the National Assessment of Educational Progress (NAEP) from 2009 to 2017 that contains the assessment scores in mathematics and literacy (reading) of students across the country. Because the student sample is nationally representative, we can compare the student performance in Illinois with that in other non-edTPA states before and after the adoption of edTPA in 2015. Our analysis revealed that edTPA had no statistical impact on the mathematics and reading scores of the students at grade 4. However, there was a relationship between the application of the assessment and a 4.3-point decrease in the reading score of students at grade 8. Although the magnitude is small (only one-tenth of the standard deviation of the score), the effect size is statistically significant.

The first section of the report provides background on the edTPA and its introduction to the Illinois teacher licensure system. Section two utilizes the 2017 sample of NAEP to provide a general picture of student performance in Illinois, and it is compared with the Midwest and national averages. In the main analysis, a difference-in-differences approach is deployed to estimate the causal effect of edTPA on student performance and teacher practices in Illinois.

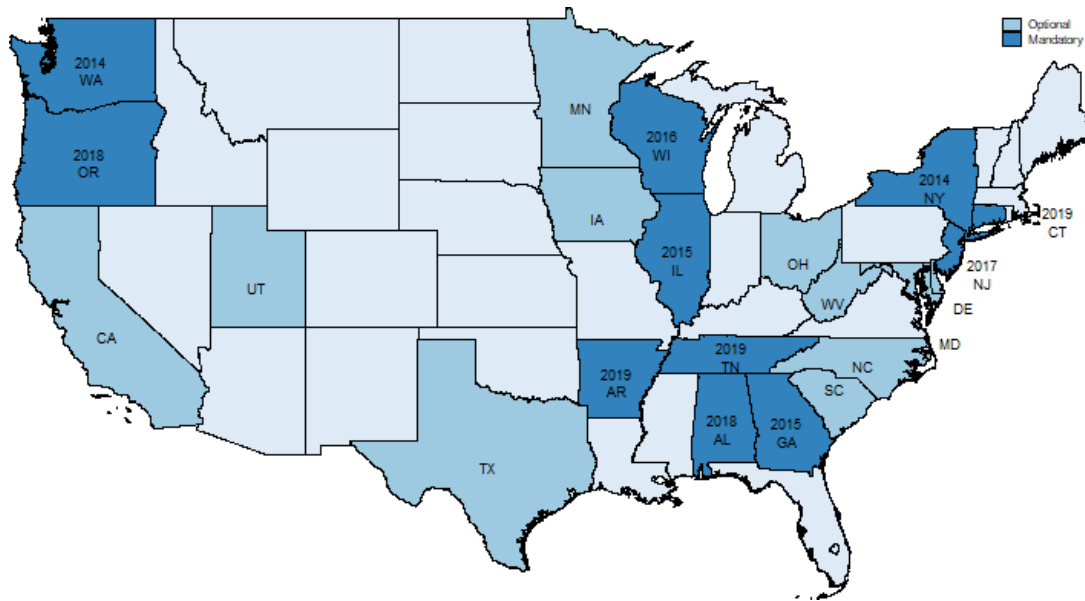
Teacher Licensure in Illinois and edTPA

Beginning in 2003 the Assessment of Professional Teaching (APT) was the written examination used to assess teaching effectiveness in Illinois (Presley, 2003). In July 2015, however, Illinois replaced the APT with the edTPA for initial teacher licensure. EdTPA was developed by the Stanford Center for Assessment, Learning and Equity (SCALE) and the American Association of Colleges for Teacher Education (AACTE) and later administered by Pearson Education, Inc. EdTPA emphasizes performance-based assessment, which requires that teacher candidates show competency by 1) submitting detailed lesson plans, 2) delivering instruction effectively by recording the lesson during the internship, and in 3) properly assessing student performance to guide future instruction by a thorough analysis of student learning outcomes.

As of 2019, 23 states have introduced edTPA to evaluate teaching effectiveness for prospective public school teachers (Figure 1).¹ Along with Georgia, New York, and Washington, Illinois was among the earliest wave of states to mandate edTPA as a necessary component for initial teacher licensure. The mandatory nature of edTPA later expanded to Alabama, New Jersey, Wisconsin, Connecticut, Arkansas, Oregon, and Tennessee. The rest of the 12 states (represented below in states without dates) approved edTPA as an option for teacher performance assessment.

¹ Official document can be found here: https://secure.aacte.org/apps/rl/res_get.php?fid=1014&ref=edtpa

Figure 1: edTPA Adoption By State



Source: edTPA official website

Note: As of 2019, twelve states (light blue) have approved edTPA as an option for teacher performance assessment and eleven states (dark blue) have mandated edTPA as a requirement for initial teacher licensure.

General Student Performance

In our report, we first analyze the National Assessment of Education Progress (NAEP) administered by the U.S Department of Education and the Institute of Education Sciences. The assessment is the only nationwide test in the US that measures the knowledge of a representative sample of students in various core subjects.² The standardized nature of the test enables us to compare student achievement across the country using a common measurement.

Table 1 compares the 4th and 8th grade math and reading scores in Illinois with the rest of the country in 2017. For the math score at grade 4, the Illinois average is 238.8, which is similar to the Midwest and national average. The Illinois minimum and maximum math scores are, however, slightly lower than the other Midwest states. The average reading scores in grades 4 and 8 in Illinois are also similar to the Midwest and national averages. Different from the pattern in the math score, Illinois has a higher minimum and a lower maximum in the reading scores both at grades 4 and 8, resulting in a less dispersed distribution than the rest of the country.

Table 2 documents the racial and gender achievement gaps in Illinois and the entire US by running multivariate regressions on the full sample from 2009 to 2017. Black students trailed behind in both the math and reading scores. In the odd number columns, compared to white students, black students in Illinois scored 16.38 points lower in mathematics, 15.41 points lower in reading at grade 4, and 18.6 points lower in reading at grade 8. Compared to the racial achievement gaps in the rest of the US shown in even number columns, the gaps in Illinois are similar.

² The subjects include reading, mathematics, science, writing, arts, civics, geography, economics, U.S. history, and technology & engineering literacy.

Table 1: Student Performance in Illinois, Midwest, and National Average (2017)

	mean	min	max
Math (Grade 4)			
National (exclude Midwest)	239.4	118.7	343.7
Midwest (exclude Illinois)	241.6	129.2	337.7
Illinois	238.8	119.4	331.0
Reading (Grade 4)			
National (exclude Midwest)	221.7	27.34	326.4
Midwest (exclude Illinois)	223.1	70.63	332.0
Illinois	221.9	84.96	320.4
Reading (Grade 8)			
National (exclude Midwest)	266.1	105.1	369.3
Midwest (exclude Illinois)	269.0	89.34	366.8
Illinois	267.7	114.6	348.4

Data source: NAEP (2017)

Female students, by contrast, trailed males only in mathematics. The Illinois sample in Column 1 shows a gender achievement gap of 3.2 points. For reading scores, female students perform slightly better than male students both at grade 4 (3.9 points higher) and grade 8 (5.7 points higher). The magnitudes are similar in the national sample in Column 4 and 6.

Table 2: Racial and Gender Achievement Gap

	(1)	(2)	(3)	(4)	(5)	(6)
	Math (grade 4)		Reading (grade 4)		Reading (grade 8)	
black	-16.38*** (0.794)	-15.03*** (0.123)	-15.41** (0.935)	-14.01*** (0.139)	-18.60*** (0.919)	-17.79*** (0.147)
female	-3.160*** (0.329)	-3.568*** (0.053)	3.946*** (0.383)	4.222*** (0.061)	5.701*** (0.366)	7.308*** (0.062)
Constant	240.0*** (1.386)	244.3*** (3.764)	234.3*** (1.422)	222.3*** (8.340)	281.9*** (0.875)	270.4*** (5.355)
Sample	Illinois	National	Illinois	National	Illinois	National
Observations	21,850	823,300	22,480	839,150	20,430	752,340
R-squared	0.428	0.396	0.465	0.432	0.453	0.424

Data source: NAEP (2009 to 2017)

Note: Each regression controls for student characteristics (ethnicity, learning disabilities, lunch program participation), school and year fixed effects. Standard errors clustered at the school level. ***, **, * represents the significant level at 1%, 5%, 10%, respectively.

EdTPA and Student Outcomes

To assess the effect of edTPA on student achievement in Illinois, we utilize the bi-annual restricted data from 2009 to 2017 that contains mathematics scores at grade 4 and reading scores at grades 4 and 8.³

In addition to providing rich student level responses and school characteristics, the data also links the information on training and instructional practices of the corresponding subject teacher. Because edTPA only affects new teachers, we restrict the sample to teachers who have less than two years of teaching experience. To ensure a clearer comparison between Illinois and non-edTPA states, we dropped the states which mandated edTPA by 2017 (i.e., Georgia, New York, Washington, and Wisconsin).

In the empirical analysis, we employ a difference-in differences (DID) approach where the variable of interest is a treatment dummy that equals 1 for Illinois in 2017. The analysis compares the math and reading scores in Illinois with those in non-edTPA states before and after 2015, the year Illinois mandated edTPA for new teacher licenses. In addition to detailed student (race, ethnicity, gender, learning disabilities, lunch program participation) and school characteristics (charter school, urban school, enrollment, percent of black and Asian students), we also control for state-specific time trends. This alleviates the concern that students in Illinois are inherently different from the rest of the country.

Table 3 presents the DID results for math and reading scores. As shown in Column 1 and 2, edTPA had essentially no impacts on the math and reading scores of students at grade 4. By contrast, as shown in Column 3, edTPA was associated with a 4.3-point decrease in the reading score of students at grade 8. Although the magnitude is small (about 1.6% of the average NAEP score of 272.2 and 10% of the standard deviation), the effect size is statistically significant. The results on both the mathematics and reading test raise a concern over the effectiveness of the edTPA.

³ The restricted data also tracks the mathematics scores at grade 8. However, it does not contain teacher experience. Therefore, we cannot identify new teachers.

Table 3: Student Test Scores Did Not Improve After EdTPA

	(1) Grade 4 - Math	(2) Grade 4 - Reading	(3) Grade 8 - Reading
edTPA	-0.306 (0.723)	-0.280 (0.825)	-4.337*** (0.929)
Constant	255.4*** (0.721)	235.6*** (1.066)	272.2*** (0.714)
Observations	55,470	56,720	42,200
R-squared	0.331	0.379	0.384

Data source: NAEP (2009,2011,2013,2015,2017), excluding Georgia, New York, Washington, and Wisconsin

Note: Every regression controls for student (race, ethnicity, gender, learning disabilities, lunch program participation) and school characteristics (charter school, urban school, enrollment, percent of black and Asian students), year and state fixed effects, and state-specific trends. Standard errors clustered at the state level. ***, **, * represents the significant level at 1%, 5%, 10%, respectively.

EdTPA and Teacher Characteristics

In this section, we explore a possible reason for the apparent negative impact of edTPA on reading scores by leveraging the detailed information in NAEP on teacher background and pedagogy. Our approach is twofold. We first identify the key teacher attributes that matter for the reading score of students. This is followed by examining whether edTPA changed the factors that could potentially explain the negative impact on student scores.

For the educational background of teachers, we denote an indicator of “advanced degree” (equals 1) if the teacher had a postgraduate degree/certificate. For information on pedagogy, we use the questions on instructional practices exercised in Language classes. In particular, the subject teacher answered the extent to which, on a scale from 1 (not at all) to 4 (large extent), he/she focused on “fiction,” “literary nonfiction,” “poetry,” “exposition” or “argumentation and persuasion.” We define a corresponding outcome variable equals 1 for each category if the teacher answered ‘4’ in the question. These outcomes then measure whether they emphasized a particular teaching style.

To identify which factors influenced the reading scores the most within the 2017 sample, a multivariate regression was run regressing the reading scores of students at grade 8 on the aforementioned instructional practices and teacher degree.⁴ Column 1 to 6 in Table 4 separately presents the influence of a teacher’s approach to teaching reading on the reading scores of students at grade 8. All six of the attributes are significantly related to the reading score, with stronger effects from teachers emphasizing fiction, exposition, or having an advanced degree. Only these three attributes consistently show significant influences when we include all attributes together in one regression in Column 7.

⁴ The regressions also control for student and school characteristics.

Table 4: What Kinds of Reading Teaching Improves Students' Reading Scores?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pedagogy							
fiction	2.281*** (0.273)						1.746*** (0.316)
nonfiction		1.437*** (0.235)					0.188 (0.285)
poetry			1.640** (0.782)				0.109 (0.765)
exposition				2.206*** (0.334)			1.295*** (0.447)
argumentation					1.766*** (0.375)		0.592 (0.586)
Qualification							
advanced degree						2.122*** (0.333)	1.915*** (0.357)
Constant	237.5*** (0.828)	238.1*** (0.803)	238.6*** (0.795)	238.3*** (0.820)	238.5*** (0.763)	237.7*** (0.786)	236.5*** (0.830)
Observations	257,080	257,080	257,080	257,080	257,080	257,080	257,080
R-squared	0.560	0.559	0.559	0.559	0.559	0.559	0.560

Data source: NAEP (2017, excluding Georgia, New York, Washington, and Wisconsin)

Note: Dependent variable is the reading score of students. Standard errors clustered at the state level. ***, **, * represents the significant level at 1%, 5%, 10%, respectively.

A second step investigated whether edTPA changed either of the teacher attributes that influenced reading scores the most. Table 5 presents the corresponding results using a difference-in-differences approach. Teachers who went through edTPA were less likely to teach non-fiction and exposition (Column 2 and 4) but were more likely to teach argumentation (Column 5). “Exposition” is a practice significantly related to the reading score as shown in Column 7 of Table 4. This provides one potential mechanism through which edTPA may have contributed to a negative impact on the student’s reading score. In addition to the change in instructional practices, Column 6 also indicates that after edTPA new teachers in Illinois were less likely to possess an advanced degree. This offers another potential mechanism to explain the negative effect of edTPA.

Table 5: EdTPA Changed Teachers' Characteristics/Practices

	(1) fiction	(2) Non- fiction	(3) poetry	(4) exposition	(5) argumentati on	(6) advanced degree
edTPA	0.0196 (0.0155)	-0.122*** (0.0160)	-0.00892 (0.00809)	-0.0323** (0.0145)	0.0799*** (0.0121)	-0.0454*** (0.0155)
Constant	0.0767*** (0.00812)	0.00781 (0.00662)	0.0164*** (0.00446)	-0.00276 (0.00672)	-0.0115 (0.00832)	0.117*** (0.00964)
Observations	14,110	14,110	14,110	14,110	14,110	14,110
R-squared	0.289	0.154	0.064	0.126	0.149	0.146

Data source: NAEP (2009,2011,2013,2015,2017), excluding Georgia, New York, Washington, and Wisconsin

Note: Dependent variables are instructional practices of teachers in Column 1 to 5, and teacher qualification in Column 6. Standard errors clustered at the state level. ***, **, * represents the significant level at 1%, 5%, 10%, respectively.

One additional plausible explanation for the lack of an association between edTPA and increased student learning is the possible lack of alignment between the requirements of edTPA and the actual practices that benefit student's learning (Au, 2013; Chiu, 2014; Denton, 2013; Madeloni and Gorlewski, 2013; Polly et al., 2020). The high course workload of edTPA may have limited the focus of teacher candidates to assessment compliance as opposed to actually learning to teach (Meuwissen et al., 2016; Paugh et al., 2018).

Conclusion

This report offers the first quantitative evidence about the effect of edTPA on student academic performances. Our discussion is applicable to educational policy-makers nationwide, especially in the states which have integrated or are planning to integrate edTPA as a necessary component for initial teacher licensure. Our findings imply that edTPA did not achieve its intended goal of improving student learning.

Other than edTPA, concurrent factors could also have affected student performance in Illinois. This is an important caveat in interpreting the negative effects on the reading scores. However, according to our statistical model that had taken into account changes in student and school characteristics, we can conclude that edTPA is one important factor driving the pattern. We highlighted two potential reasons. First, the time and money required by edTPA crowded out the candidates' investment in graduate study. This discouraged higher-quality teachers from entering the teaching profession. Second, new teachers in Illinois put less focus on expository writing, an important approach to developing the reading skill of students.

Based on the report's findings, we recommend the Illinois State Board of Education reconsider the role of edTPA in the teacher licensure system.

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