# TECHNICAL APPENDIX

## Model for Method 1: Controlling for Past Performance

$$Y_i = \beta_0 + \beta_1 Coach_i + \beta_2 Participant_i + \beta_3 Prior\ Performance_i + \beta_4 Beginning\ Teacher_i + \varepsilon_i$$

$Y_i$ represents an individual teacher's 2012-13 score on either a component of the TEAM rubric or TVAAS. The coach and participant variables indicate whether the teacher was a 2012 math Common Core coach or participated in the summer 2012 TNCore Training. Prior performance represents a teacher's 2011-12 score for the outcome variable. $\varepsilon_i$ represents all other factors that affect the outcome including measurement error. The beginning teacher variable indicates whether a teacher was in their second or third year of teaching[1]. Results are shown below. Each column represents a separate regression model. Standard errors were clustered at the teacher level.

**Results for Method 1: 2012-13 Classroom Instructional Practices and Teacher Effectiveness for Coaches and Participants Compared to Non-Participants**

| | Problem Solving | Thinking | Questioning | Academic Feedback | Instruction Domain | TVAAS[2] |
|---|---|---|---|---|---|---|
| Coach | 0.31$^{***}$ | 0.28$^{***}$ | 0.24$^{***}$ | 0.22$^{***}$ | 0.12$^{**}$ | 0.22$^{**}$ |
| | (0.07) | (0.08) | (0.07) | (0.06) | (0.04) | (0.08) |
| Participant | 0.07$^{***}$ | 0.08$^{***}$ | 0.06$^{***}$ | 0.08$^{***}$ | 0.05$^{***}$ | 0.08$^{**}$ |
| | (0.02) | (0.02) | (0.01) | (0.02) | (0.01) | (0.03) |
| Past Performance | X | X | X | X | X | X |
| Teacher Experience | X | X | X | X | X | X |
| Observations | 9636 | 9314 | 9314 | 9313 | 9640 | 5081 |

$^{+}$ $p < 0.10$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$

## Model for Method 2: Taking School Environment into Account

$$Y_i = \beta_0 + \beta_1 Coach_i + \beta_2 Participant_i + \beta_3 Prior\ Performance_i + \beta_4 Beginning\ Teacher_i + \alpha_i + \varepsilon_i$$

The model above is similar to the model shown for the first method. However, it includes $\alpha_i$, which indicates a school fixed effect.

[1] First year teachers were excluded because they did not have prior scores.

[2] Results indicate the predicted increase in standard deviations of teacher effectiveness.

**Results for Method 2: 2012-13 Classroom Instructional Practices and Teacher Effectiveness for Coaches and Participants Compared to Non-Participants**

| | Problem Solving | Thinking | Questioning | Academic Feedback | Instruction Domain | TVAAS |
|---|---|---|---|---|---|---|
| Coach | 0.36*** | 0.28*** | 0.20** | 0.23** | 0.16*** | 0.21* |
| | (0.06) | (0.08) | (0.07) | (0.07) | (0.04) | (0.10) |
| Participant | 0.09*** | 0.10*** | 0.08*** | 0.11*** | 0.05*** | 0.06+ |
| | (0.02) | (0.01) | (0.01) | (0.01) | (0.01) | (0.03) |
| School Fixed Effects | X | X | X | X | X | X |
| Past Performance | X | X | X | X | X | X |
| Teacher Experience | X | X | X | X | X | X |
| Observations | 9636 | 9314 | 9314 | 9313 | 9640 | 5081 |

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

**Model for Method 3: Adjusting for Teacher Characteristics**

$$Y_{it} = \beta_0 + \beta_1 Coach_{it} + \beta_2 Participant_{it} + \gamma_3 Grade\ Level_{it} + \gamma_4 Year_{it} + \delta_i + \varepsilon_{it}$$

$Y_{it}$ represents an individual teacher's TVAAS score for each year. The TVAAS score is a function of the teacher's fixed characteristics $\delta_i$, whether the teacher was a coach and participant during a particular year, grade level, year, and all other factors that affect TVAAS scores, including measurement error. We also conducted a model including teacher experience, which also resulted in a statistically significant estimate of 0.08 for participating in the training.

**Method 3 Results: 2012-13 Teacher Effectiveness for Coaches and Participants**

| | TVAAS |
|---|---|
| Coach | 0.03 |
| | (0.12) |
| Participant | 0.08* |
| | (0.03) |
| Grade Level | X |
| Year | X |
| Individual Fixed Effects | X |
| Observations[3] | 38047 (11490 teachers) |

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[3] In the individual fixed effects model, there are multiple observations for each teacher. A teacher has an observation for each annual, grade-level TVAAS score received.

**Coach at School Model**

$$Y_i = \beta_0 + \beta_1 Participant\ with\ Coach_i + \beta_2 Prior\ Performance_i + \beta_3 Beginning\ Teacher_i + \eta_i + \varepsilon_i$$

The model above is used to examine whether participants in coach schools benefited from the trainings more than participants in non-coach schools. Only training participants are included in this analysis. The participant with coach variable indicates whether a Common Core coach was located in the same school as the teacher. The $\eta_i$ indicates a district fixed effect.

**2012-13 Classroom Instructional Practices for Participants with a Coach in their School Compared to Participants without a Coach in their School**

| | Problem Solving | Thinking | Questioning | Academic Feedback | Instruction Domain |
|---|---|---|---|---|---|
| Participant with | -0.01 | 0.01 | 0.08* | 0.05 | 0.00 |
| Coach in School | (0.04) | (0.04) | (0.03) | (0.04) | (0.03) |
| District Fixed Effects | X | X | X | X | X |
| Past Performance | X | X | X | X | X |
| Teacher Experience | X | X | X | X | X |
| Observations | 9533 | 9225 | 9226 | 9529 | 9226 |

$^{+}$ $p < 0.10$, $^{*}$ $p < 0.05$, $^{**}$ $p < 0.01$, $^{***}$ $p < 0.001$