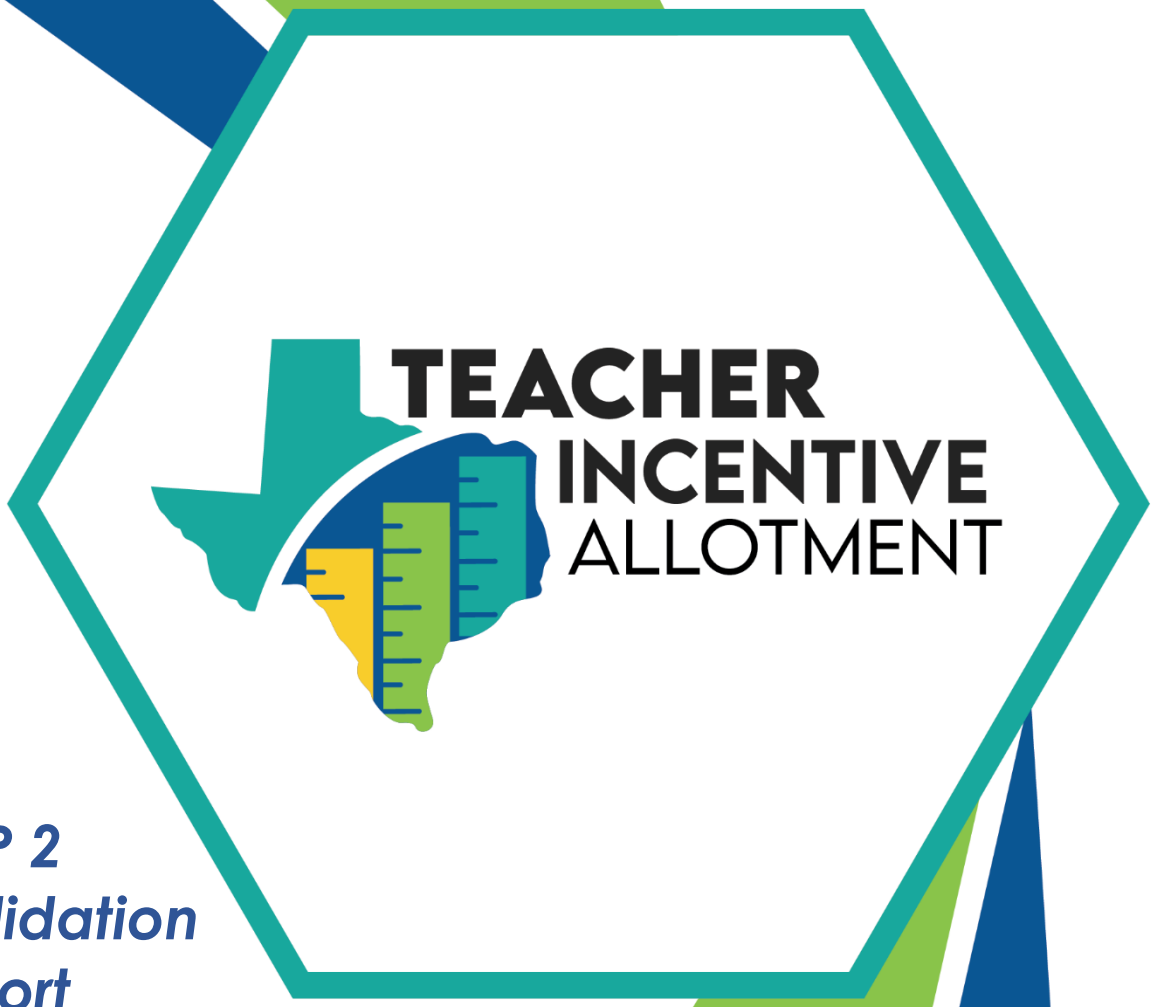
***Killeen ISD***




# *STEP 2 Data Validation Report*

## *Spring 2025*

For questions about the analysis and results,

contact TIA@ttu.edu.

## Purpose and Process of Data Validation

District approval to designate teachers involves a two-step review process. The first step is carried out by the Texas Education Agency (TEA). The second step is performed by TEA in collaboration with Texas Tech University. TEA reviews the results from Step 1 and Step 2 to determine final approval.

This report pertains to the second step in the approval process. In Step 2, data provided by districts about designated and all designation-eligible teachers are examined to verify that the district system produced reliable results, and that there is a consistent, positive association between teacher observation scores and measures of student growth. Additional analyses comparing district results to state-level results are performed to ensure that teachers earning district designations are indeed among the most effective in the State. Based on feedback from previous cohorts, we have added some general guidance and suggestions for next steps after leaders have reviewed the scoring for the district's local designation system (see Appendix A).

**Verifying District Results**

In Year 6, TEA and Texas Tech operationalized the method for verification by using 13 indicators as checks for evidence of the reliability and validity of district systems. These 13 checks were compiled into a rubric that Texas Tech uses to evaluate district data (see Appendix B). There are five main domains for these checks that include examining:

A. The association between observation and district-reported student growth.
B. The relation of district-reported student growth and statewide value-added scores.
C. The extent to which observation and district-reported student growth are equivalent for teachers in designation categories across campuses and teaching assignments.
D. The extent to which district designation patterns conform to patterns found in state-level analyses of growth and observation.
E. Supplemental checks that examine the similarity of designation patterns among districts with similar Domain 2A ratings, the variability of observation scores, and the extent to which the ranking of teachers based on observation and growth scores aligns with their ranking on statewide performance standards.

Scores on the supplemental checks 10, 11, 12, and 13 do not count towards or take away from the summative Step 2 score. Instead, the supplemental checks are intended to support future efforts to improve district local designation systems. This year, the supplementary check 10 was not performed because Domain 2a ratings were unavailable. Note, in future years, the 13 checks are subject to change.

Once analysts have completed the 13 checks, scores are assigned in the rubric. Some scores are weighted more heavily than others. Greater weights reflect the relative value of each check as it pertains to the intended functioning of the designation system. The rubric enables analysts to produce a summative score for the district, and provides data needed to inform a judgment about whether the district system does indeed result in the identification and designation of the most effective teachers in the State. Additional technical information is provided in Appendix C about the specific statistical analysis performed for each check.

A small number of districts that may fall just below the passing cut line after TEA's review will have the opportunity to appeal the decision. To submit an appeal, districts will provide additional qualitative and quantitative supporting data to reflect their particular context. These additional data will then be reviewed. A district whose appeal is granted will receive a one-year provisional approval and must receive full approval the following year to continue to designate teachers. Further details will be provided to districts who qualify for this opportunity.

# Results for Killeen ISD

## Descriptive Statistics from Data Submission

Basic information about Killeen ISD and the data submitted for verification are summarized in Table 1. This table contains information including district name (and number) along with the date on which data files were transferred to Texas Tech University for evaluation, the name of the rubric used for teacher observation, and the number of designated teachers and teachers in eligible teaching assignments included in the files.

**Table 1.**
*Basic Information of Data Submission*

| | |
|---|---|
| District Name: | **Killeen ISD** |
| District Number: | **014906** |
| Date of Initial File Transfer: | **October 7, 2024** |
| Date of Final File Transfer: | **October 7, 2024** |
| Observation Rubric Used: | **T-TESS** |
| Number of Designated Teachers: | **117** |
| Number of Teachers Submitted in Data Submission File: | **1313** |

Table 2 also contains district information about the number and the percentage of teachers designated by level. Of the 1313 teachers in eligible teaching assignment, 117 (8 %) were identified for designation.

**Table 2.**
*Frequency of Teacher Designation*

| **Category** | ***n*** | **%** |
|---|---|---|
| Master | 22 | 1 % |
| Exemplary | 51 | 3 % |
| Recognized | 44 | 3 % |
| Non-designated | 1196 | 91 % |
| Total | 1313 | 100 % |

## Data Validation Scores

Table 3 contains results from all the verification checks along with the rubric score and the resulting weighted score. When district data sets were limited and the analysis associated with the check could not be performed, the check and associated points were omitted. The omission of checks does not negatively impact the district's score. The notation of N/A in Table 3, if present, indicates omitted checks. For your district, the total point value possible was 96.

***The total verification score for Killeen ISD was 73.15 out of 96 possible points, or 76 %. Based on holistic review of your application system and the results in this report, this is a passing score for the data generated by the district's designation system.***

**Table 3.**
*Step Two Verification Scores*

| *Domain* | *Check* | *Possible Points* | *Results* | *Score* | *Weight* | *Score × Weight* |
|---|---|---|---|---|---|---|
| *A. Correlation between teacher observation ratings and student growth ratings* | C1 | 0-3 | $r$ = 0.37 | 3.00 | × 10 | 30.00 |
| *B. Relationship between teacher designations and VAM* | C2 | 0-3 | $\tau$ = 0.17 | 1.37 | × 7 | 9.60 |
| | C3 | 0-3 | $s$ = 0.25 | 1.77 | × 3 | 5.32 |
| *C. Degree of reliability for observation and growth judgements* | C4 | 0-3 | sp. $\omega^2$ = 0.00 | 3.00 | × 3 | 9.00 |
| | C5 | 0-3 | sp. $\omega^2$ = 0.05 | 2.10 | × 2 | 4.21 |
| | C6 | 0-3 | sp. $\omega^2$ = 0.00 | 3.00 | × 3 | 9.00 |
| | C7 | 0-3 | sp. $\omega^2$ = 0.28 | 0.00 | × 2 | 0.00 |
| *D. Comparison of district designation percentage to statewide performance standards* | C8 | 0-3 | $s$ = 85 % | 3.00 | × 1 | 3.00 |
| | C9 | 0-3 | $s$ = 93 % | 3.00 | × 1 | 3.00 |
| *E. Supplemental checks* | C10 | 0-3 | *Not performed* | | × 0 | – |
| | C11 | 0-3 | $\sigma$ = 0.13 | 3.00 | × 0 | – |
| | C12 | 0-3 | $\rho$ = 0.32 | 1.83 | × 0 | – |
| | C13 | 0-3 | $\rho$ = 0.45 | 2.81 | × 0 | – |
| | | | | | **Total** | **73.15 / 96** |

*Note*. $r$ = Pearson product-moment correlation coefficient; $\tau$ = Kendall rank correlation coefficient; sp. $\omega^2$ = semi-partial omega-squared; $\sigma$ = standard deviation; $\rho$ = Spearman rank correlation coefficient.

## Distribution of and Relation Between Teacher Observation and Student Growth

The figures below provide a representation of how teacher observation ratings and student growth are distributed in the district's data submission of designation-eligible teachers this year. Please note, teacher observation ratings have been converted to the proportion of total points earned on the district's appraisal rubric. Figure 1 can be examined to determine the extent to which the distribution of observation ratings (blue bars) follow a pattern similar to the distribution of student growth percentages (red bars). Figure 2 provides a 1:1 match between growth and observation and can be examined to determine the extent to which teachers who have higher percentages of students meeting or exceeding growth targets also receive higher appraisal ratings.

**Figure 1**. *Distribution of Percentage of Students Meeting Growth Standards and Teacher Observation Ratings*

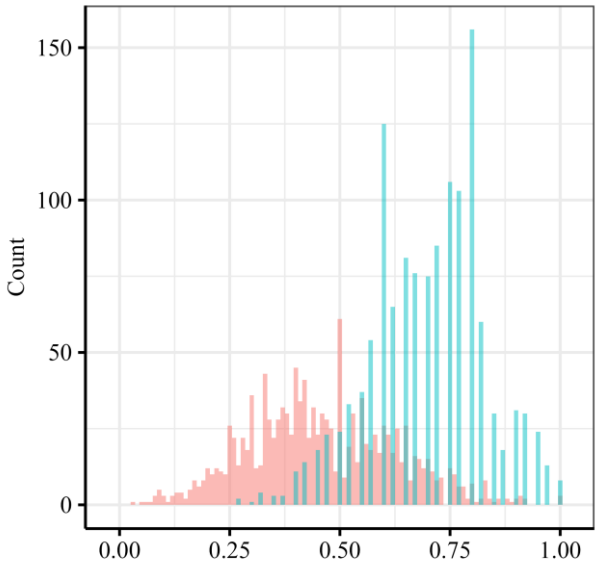
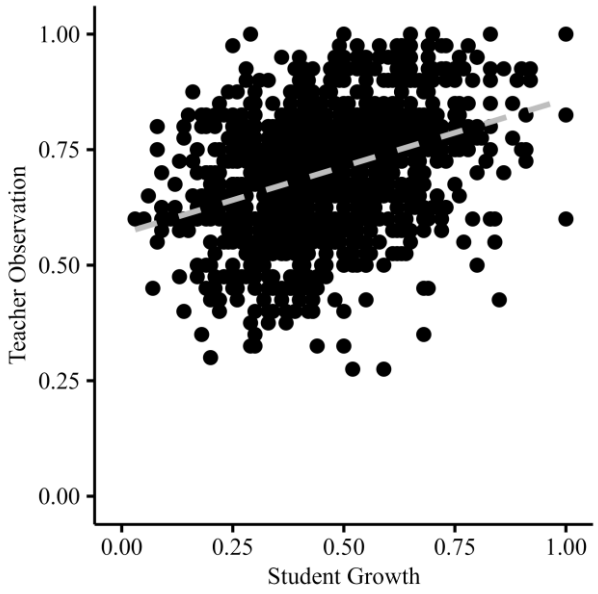



**Figure 2.** *A 1:1 Match of Individual Teachers' Observation and Growth*



# Appendix A

## Analyzing LEA Rubric Scores: Considerations for Next Steps

**Domain A. Correlation between teacher observation ratings and student performance ratings**

*This check is intended to confirm that teachers' appraisal scores are related to student growth scores.*

Next Steps:

- Dive deeper into your district's correlation to uncover areas of focus for improvement. This could be a particular campus/appraiser, student growth measure, TIA teacher category or even a subject/grade-level.
- Look for areas of inflation in your teacher observation and growth scores.

Questions to Consider:

- Do flaws exist in your appraisal system that require recalibration or more training?
- Do flaws exist in the construction, administration and/or calculation of your student growth measure?
- Is inflation in teacher observation and growth scores happening at a particular campus, a specific subject/grade level, or maybe with a certain appraiser?

Resources:

- TIA Excel Analysis Tool
- Correlation Resources

*Keep in mind that the root of the issue could be teacher observation, student growth or both.*

**Domain B. Confirm relation between district designations and VAM**

*These checks are intended to confirm that district designations are aligned with state-level student-growth calculations. For the current year, this analysis compares district designations to SY2022-2023 VAM data.*

Next Steps:

- Using the Texas VAM data compare the general ranking of district designations to Texas VAM designations
- Using the Texas VAM data compare the number of "over designation" or "under designations" in your system when comparing local designation decisions to the Texas VAM designations.

Questions to Consider:

- Is there enough stretch in the data to accurately distinguish between effective and ineffective teachers?
- What other components are contributing to designation decisions? Is this causing problems in my designation system?
- Are the same students being looked at for my growth measure as STAAR?
- Are you measuring growth in a consistent way across all growth measures?
- Are you administering the growth measure with the same fidelity as STAAR?
- How do the number of designations you issued compared to the Texas VAM designations? Does this percent of designations make sense for your district compared to your performance in the state?

Resources:

- SAS EVAAS Manual
- Walkthrough on the Statewide VAM model

**Domain C. Degree of reliability for observation and growth judgements**

*These checks are intended to confirm that observation ratings and student performance are determined in a consistent manner across campus and teaching assignments.*

Next Steps

- Dive deeper into your district's observation and growth scores specific to each designation level.
- Using the Texas VAM data compare overall student growth a district submits to what is represented by Texas VAM. Determine if large differences exist for a specific teacher category or specific campuses.

Questions to Consider:

- Do designated teachers in each respective designation level across campuses, assignments, and teacher categories have similar student growth scores and teacher observation ratings? Do you believe that designation decisions are "fair" for each designation level?
- Do you notice trends at the campus level, teaching assignment level, or teacher category level that are causing designations to appear unfair?
- What type of support would an appraiser need to ensure they are rating teachers fairly?
- Were any trends noted caused because a particular appraiser gave higher scores on a campus relative to other appraisers on that campus or relative to scores on like campuses?
- Was the fidelity in administration of growth measure in one teaching assignment different than in another teaching assignment?
- How consistent was growth measured across all growth measures?
- Are your student growth and teacher observation from the same grade and subject?

Resources:

- Teacher Calibration Protocols
- Teacher Observations for the Teacher Incentive Allotment
- Setting Expected Growth Targets Training
- Third-Party Assessment Options

**Domain D. Comparison of district designation percentage to statewide performance standards**

*These checks are intended to confirm that designation rates in each district are aligned with statewide projections of the proportion of designated teachers in each district.*

Next Steps:

- Dive deeper into each individual **designated** teacher's observation and growth scores.
- Using Texas VAM look at the distribution of designations for Texas VAM using the statewide performance standards and compare to the distribution of district determined designations. Determine if large differences exist across eligible teacher groups or campuses.

Questions to Consider:

- How close are my designated teachers to the statewide performance standards? Are the differences explicable? (e.g., my district is a high performing district compared to that of the average district in the state)
- Are there other contributing factors in making designation decisions that are causing my designated teachers to have large differences to the statewide performance standards?
- Are the differences in the performances caused by inflated growth scores or observation scores? (e.g., large number of teachers having 100% growth on the SLO growth measure, or large number of teaches receiving all 4's and 5's on T-TESS)

Resources:

- Statewide Performance Standards: Teacher Observation
- Statewide Performance Standards: Student Growth

# APPENDIX B

## Verification Rubric for TIA Step 2

| None or almost no evidence supports judgements | Limited evidence supports the accuracy of judgements | Some evidence supports the accuracy of judgements | Most evidence supports the accuracy of judgements |
|---|---|---|---|
| **Score of 0** | **Score of 1** | **Score of 2** | **Score of 3** |

**Domain A. Correlation between teacher observation ratings and student performance ratings**

*This check is intended to confirm that teachers' appraisal scores are related to student growth scores.*

1. The correlation coefficient between observation and growth among all *eligible* teachers is within the range of expected magnitude reported in research literature.

*Earned points x 10 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $r \leq 0$ | $\frac{r - 0}{0.08 - 0}$ | $r = 0.08$ | $\frac{r - 0.08}{0.16 - 0.08} + 1$ | $r = 0.16$ | $\frac{r - 0.16}{0.24 - 0.16} + 2$ | $r \geq 0.24$ |

**Domain B. Confirm the relation between district designations and VAM**

*These checks are intended to confirm that district designations are aligned with state-level student-growth calculations. For the current year, this analysis compares district designations to SY2022-2023 VAM data.*

2. District designations of Recognized, Exemplary and Master (REM) teachers are found in similar proportion to designations as determined by the state-wide VAM.

*Earned points x 7 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $\tau \leq 0$ | $\frac{\tau - 0}{0.10 - 0}$ | $\tau = 0.10$ | $\frac{\tau - 0.10}{0.30 - 0.10} + 1$ | $\tau = 0.30$ | $\frac{\tau - 0.30}{0.50 - 0.30} + 2$ | $\tau \geq 0.50$ |

3. District designations for REM teachers, in tested subjects, are in proximity to designations as determined by the state-wide VAM.

*Earned points x 3 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $s \leq 0$ | $\frac{s - 0}{0.10 - 0}$ | $s = 0.10$ | $\frac{s - 0.10}{0.30 - 0.10} + 1$ | $s = 0.30$ | $\frac{s - 0.30}{0.70 - 0.30} + 2$ | $s \geq 0.70$ |

**Domain C. Degree of reliability for observation and growth judgements**

*These checks are intended to confirm that observation ratings and student performance are determined in a consistent manner across campus and teaching assignments.* [1]

4. Across campuses, observation scores are similar for teachers in REM groups.
*Earned points x 3 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $sp.\omega^2$ $\geq 0.25$ | $\frac{0.25 - sp.\omega^2}{0.25 - 0.14}$ | $sp.\omega^2$ $= 0.14$ | $\frac{0.14 - sp.\omega^2}{0.14 - 0.06} + 1$ | $sp.\omega^2$ $= 0.06$ | $\frac{0.06 - sp.\omega^2}{0.06 - 0.01} + 2$ | $sp.\omega^2$ $\leq 0.01$ |

5. Across campuses, percentages of student growth are similar for teachers in REM groups.
*Earned points x 2 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $sp.\omega^2$ $\geq 0.25$ | $\frac{0.25 - sp.\omega^2}{0.25 - 0.14}$ | $sp.\omega^2$ $= 0.14$ | $\frac{0.14 - sp.\omega^2}{0.14 - 0.06} + 1$ | $sp.\omega^2$ $= 0.06$ | $\frac{0.06 - sp.\omega^2}{0.06 - 0.01} + 2$ | $sp.\omega^2$ $\leq 0.01$ |

6. Across assignments, observation scores are similar for teachers in REM groups.
*Earned points x 3 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $sp.\omega^2$ $\geq 0.25$ | $\frac{0.25 - sp.\omega^2}{0.25 - 0.14}$ | $sp.\omega^2$ $= 0.14$ | $\frac{0.14 - sp.\omega^2}{0.14 - 0.06} + 1$ | $sp.\omega^2$ $= 0.06$ | $\frac{0.06 - sp.\omega^2}{0.06 - 0.01} + 2$ | $sp.\omega^2$ $\leq 0.01$ |

7. Across assignments, percentages of student growth are similar for teachers in REM groups.
*Earned points x 2 = weighted score for this check*

| 0 points | 0-1 points | 1 point | 1-2 points | 2 points | 2-3 points | 3 points |
|---|---|---|---|---|---|---|
| $sp.\omega^2$ $\geq 0.25$ | $\frac{0.25 - sp.\omega^2}{0.25 - 0.14}$ | $sp.\omega^2$ $= 0.14$ | $\frac{0.14 - sp.\omega^2}{0.14 - 0.06} + 1$ | $sp.\omega^2$ $= 0.06$ | $\frac{0.06 - sp.\omega^2}{0.06 - 0.01} + 2$ | $sp.\omega^2$ $\leq 0.01$ |

[1] Observation and growth should be equal when compared across campuses and assignments. A smaller effect-size indicates small differences, thus a greater level of agreement. A larger effect-size indicates larger differences, thus a smaller level of agreement.

**Domain D. Comparison of district designation percentage to statewide performance standards**

*These checks are intended to confirm that designation rates in each district are aligned with statewide projections of the proportion of designated teachers in each district.*

8. *The percentage of students who meet or exceed expected growth* in the district is approximately equal to the statewide performance standards for student growth in each of the teacher-designation levels (REM).

*Earned points x 1 = weighted score for this check*

| **0 points** | **0-1 points** | **1 point** | **1-2 points** | **2 points** | **2-3 points** | **3 points** |
|---|---|---|---|---|---|---|
| $s \leq 0.55$ | $\frac{s - 0.55}{0.60 - 0.55}$ | $s = 0.60$ | $\frac{s - 0.60}{0.65 - 0.60} + 1$ | $s = 0.65$ | $\frac{s - 0.65}{0.70 - 0.65} + 2$ | $s \geq 0.70$ |

9. *Observation ratings* in the district are approximately equal to the statewide performance standards for teaching proficiency in each of the REM levels.

*Earned points x 1 = weighted score for this check*

| **0 points** | **0-1 points** | **1 point** | **1-2 points** | **2 points** | **2-3 points** | **3 points** |
|---|---|---|---|---|---|---|
| $s \leq 0.50$ | $\frac{s - 0.50}{0.60 - 0.50}$ | $s = 0.60$ | $\frac{s - 0.60}{0.70 - 0.60} + 1$ | $s = 0.70$ | $\frac{s - 0.70}{0.80 - 0.70} + 2$ | $s \geq 0.80$ |

**Domain E. Supplemental Checks**

*These checks are intended to provide additional, non-scored evidence to districts about the validity of their local designation system. Check #10 reflects the degree to which designation decisions are comparable among districts with the same Domain 2A ratings. Check #11 shows the variance in district's teacher observation scores as an indicator of the extent to which observers differentiate between more effective and less effective instruction. Checks #12 and #13 indicate the level of agreement between the rankings of teachers within the district on observation/growth and VAM scores. For the current year, these checks are supplemental and are not factored into data validation scores or system validation decisions.*

10. The proportion of teachers on district campuses who are designated as *Recognized*, *Exemplary*, or *Master* is roughly equivalent to other campuses with the same Domain 2A rating.

*No points assigned for supplemental check*

| **0 points** | **0-1 points** | **1 point** | **1-2 points** | **2 points** | **2-3 points** | **3 points** |
|---|---|---|---|---|---|---|
| $w \geq 0.70$ | $\frac{0.70 - w}{0.70 - 0.50}$ | $w = 0.50$ | $\frac{0.50 - w}{0.50 - 0.30} + 1$ | $w = 0.30$ | $\frac{0.30 - w}{0.30 - 0.10} + 2$ | $w \leq 0.10$ |

11. The variability in observation ratings among all eligible teachers is within the range of expected magnitude.

*No points assigned for supplemental check*

| **0 points** | **0-1 points** | **1 point** | **1-2 points** | **2 points** | **2-3 points** | **3 points** |
|---|---|---|---|---|---|---|
| $\sigma \leq 0.06$ | $\frac{\sigma - 0.06}{0.08 - 0.06}$ | $\sigma = 0.08$ | $\frac{\sigma - 0.08}{0.10 - 0.08} + 1$ | $\sigma = 0.10$ | $\frac{\sigma - 0.10}{0.12 - 0.10} + 2$ | $\sigma \geq 0.12$ |

12. The ranking of teachers based on observation scores closely aligns with their ranking on statewide performance standards for teaching proficiency.

*No points assigned for supplemental check*

| **0 points** | **0-1 points** | **1 point** | **1-2 points** | **2 points** | **2-3 points** | **3 points** |
|---|---|---|---|---|---|---|
| $\rho \leq 0$ | $\frac{\rho - 0}{0.10 - 0}$ | $\rho = 0.10$ | $\frac{\rho - 0.10}{0.37 - 0.10} + 1$ | $\rho = 0.37$ | $\frac{\rho - 0.37}{0.64 - 0.37} + 2$ | $\rho \geq 0.64$ |

13. The ranking of teachers based on percentages of student growth closely aligns with their ranking on statewide performance standards for teaching proficiency.

*No points assigned for supplemental check*

| **0 points** | **0-1 points** | **1 point** | **1-2 points** | **2 points** | **2-3 points** | **3 points** |
|---|---|---|---|---|---|---|
| $\rho \leq 0$ | $\frac{\rho - 0}{0.10 - 0}$ | $\rho = 0.10$ | $\frac{\rho - 0.10}{0.25 - 0.10} + 1$ | $\rho = 0.25$ | $\frac{\rho - 0.25}{0.50 - 0.25} + 2$ | $\rho \geq 0.50$ |

# APPENDIX C

## Statistical Analysis Protocols for TIA Step 2

***Check 1*. The correlation coefficient between observation and growth among all eligible teachers is within the range of expected magnitude reported in research literature.**

Pearson product-moment correlation coefficient ($r$) is calculated between the teacher observation and growth scores of all eligible teachers. Pearson's coefficient is a measure of the strength and direction of linear association between two variables, which can be written as:

$$r_{xy} = \frac{\sum_{i=1}^{n}(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i-\bar{x})^2 \sum_{i=1}^{n}(y_i-\bar{y})^2}},$$

where $n$ is the sample size; $x_i$ and $y_i$ are the person $i$'s values on $x$ and $y$ (e.g., $x$ = observation score, $y$ = growth score); and $\bar{x}$ and $\bar{y}$ are the sample means of $x$ and $y$.

Correlation coefficient has a value between –1 (a perfect negative correlation) and +1 (a perfect positive correlation). A positive correlation indicates a positive relationship while a negative correlation signifies a negative relationship. For example, when teachers with higher observation scores show higher growth scores, the correlation will be positive; in contrast, when teachers with higher observation scores show lower growth scores, the correlation will be negative. Two correlations with the same numerical value have the same strength whether the correlation is positive or negative. A zero correlation indicates no relationship between the variables. The following guidelines are useful when determining the strength of a correlation: ±0.1 (small), ±0.3 (moderate), and ±0.5 (large) (Cohen, 1988, 1992).

***Check 2*. District designations of Recognized, Exemplary and Master (REM) teachers are found in similar proportion to designations as determined by the state-wide VAM.**

Kendall rank correlation coefficient ($\tau$) is calculated between the designation level that the district has made for their teachers (Master, Exemplary, or Recognized) and the same teachers' designation level that is determined by their value-added (VAM) score (Master, Exemplary, Recognized, or Not Designated). Kendall's coefficient is a measure of the strength and direction of ordinal association between two variables, which can be written as:

$$\tau_{xy} = \frac{n_c - n_d}{\sqrt{(n_0-n_1)(n_0-n_2)}},$$

where $n$ is the sample size; $n_0 = \frac{n(n-1)}{2}$; $n_1 = \sum_i \frac{t_i(t_i-1)}{2}$; $n_2 = \sum_j \frac{u_j(u_j-1)}{2}$; $n_c$ is the number of concordant pairs; $n_d$ is the number of discordant pairs; $t_i$ is the number of tied values in the $i^{\text{th}}$ group of ties for the first quantity; and $u_j$ is the number of tied values in the $j^{\text{th}}$ group of ties for the second quantity. Any pair of observations $(x_i, y_i)$ and $(x_j, y_j)$, where $i < j$, are said to be concordant if the sort of $(x_i, y_i)$ and $(x_j, y_j)$ agrees—that is, if either both $x_i > x_j$ and $y_i > y_j$ holds or both $x_i < x_j$ and $y_i < y_j$. Otherwise, they are said to be discordant.

For example, the correlation will be +1 (a perfect positive correlation) when the agreement between the district's designation and designations if determined by the state-wide VAM model is perfect (i.e., the two rankings are the same). The correlation will be positive when the two designations are similar. The correlation will be −1 (a perfect negative correlation) when the disagreement between the two designations is perfect (i.e., one ranking is the reverse of the other). When the two designations are independent, then the correlation will be approximately zero.

***Check 3. District designation decisions for Recognized, Exemplary, and Master teachers, in tested subjects, are in proximity to designations as determined by the state-wide VAM.***

For teachers of tested subjects who earned a designation in the district (Master, Exemplary, or Recognized), it is determined whether the district designation is in the same, higher, or lower than the designation if it were determined by the state-wide VAM model. An "accuracy" score ranging from –1.00 to +1.00 is assigned based on the proximity between the district designation and the designation if it were determined by the state-wide VAM model. The table below shows how values are assigned based on proximity:

| | **Designations if determined by the statewide VAM** | | | |
|---|---|---|---|---|
| **District designations** | *Not Designated* | *Recognized* | *Exemplary* | *Master* |
| *Recognized* | 0.00 | **1.00** | 0.75 | 0.50 |
| *Exemplary* | –0.25 | 0.75 | **1.00** | 0.75 |
| *Master* | –1.00 | 0.25 | 0.75 | **1.00** |

More points are given when the district designation is closer to the designations if determined by the state-wide VAM model. After a score has been assigned to each teacher, these scores are averaged to produce an overall score for the district.

***Check 4. Across campuses, observation scores are similar for teachers in REM groups.***

***Check 5. Across campuses, percentages of student growth are similar for teachers in REM groups.***

Analysis of variance (ANOVA) is performed to compare teachers' observation score (Check 4) or growth score (Check 5) across different campuses. The analysis model includes the main effects of campus and teacher designation (Master, Exemplary, Recognized) as well as their interaction effect. Then, semi-partial omega-squared ($\omega^2$) for the campus effect is calculated. Semi-partial omega-squared is a measure of standardized group difference (effect size)—the proportion of the variance in a dependent variable (e.g., observation or growth score) that is accounted for by the independent variable (e.g., campus), with other effects (terms) in the model parsed out of the independent variable. It can be written as:

$$\text{semi-partial } \omega^2 = \frac{df_{\text{effect}}(MS_{\text{effect}} - MS_{\text{error}})}{df_{\text{effect}} MS_{\text{effect}} + (N - df_{\text{effect}}) MS_{\text{error}}},$$

where $N$ is the sample size; $df$ is the degrees of freedom; $MS_{\text{effect}}$ is the mean sum of squares for the independent variable; and $MS_{\text{error}}$ is the mean sum of squares for the error. (Semi-partial) omega-squared is widely viewed as a lesser biased alternative to (semi-partial) eta-squared, especially when sample sizes are small.

Semi-partial omega-squared can have a value between –1 and +1. The following guidelines are useful when determining the strength of a semi-partial omega-squared: 0.01 (small), 0.06 (moderate), and 0.14 (large) (Cohen, 1988, 1992). A zero or negative value indicates no effect of the independent variable when controlling for the other effects included in the model.

***Check 6. Across assignments, observation scores are similar for teachers in REM groups.***

***Check 7. Across assignments, percentages of student growth are similar for teachers in REM groups.***

ANOVA is performed to compare teachers' observation score (Check 6) or growth score (Check 7) across different teaching assignments. Teaching assignment is defined as two or more eligible teacher groups; or defined as tested subjects, non-tested subjects, or both subjects when there is only one eligible teacher group. The analysis model includes the main effects of teaching assignment and teacher designation (Master, Exemplary, or Recognized) as well as their interaction effect. Then, semi-partial omega-squared ($\omega^2$) for the teaching assignment effect is calculated.

***<u>Check 8</u>. The percentage of students who meet or exceed expected growth in the district is approximately equal to the statewide performance standards for student growth in each of the teacher-designation levels (REM).***

***<u>Check 9</u>. Observation ratings in the district are approximately equal to the statewide performance standards for teaching proficiency in each of the REM levels.***

For teachers who earned a designation in the district (Master, Exemplary, or Recognized), it is determined how close their growth score (Check 8) or observation score (Check 9) is to the published cut-point that corresponds to their designation category. A closeness score based on the proximity of the growth score or observation score to the corresponding performance standard at each designation level is established on a 0-100% scale. The score value is calculated using an exponential equation that assigns a score based on the proximity of each teacher's score to the corresponding performance standard. More points are given when the score is closer to the performance standard. After a score has been assigned to each teacher, these scores are averaged. The state published cut-points used are shown below:

| Growth standard group | % of students meeting or exceeding growth targets |
|---|---|
| *Recognized* | 55% |
| *Exemplary* | 60% |
| *Master* | 70% |

| Observation standard group | Based on T-TESS | Based on another rubric |
|---|---|---|
| *Recognized* | 3.7 | 74% of points |
| *Exemplary* | 3.9 | 78% of points |
| *Master* | 4.5 | 90% of points |

The exponential equations used are shown below:

*In Check 8*
For Master teachers,

$$s_i = f(x_i) + g(x_i)\left(\frac{x_i-0.5}{0.7-0.5}\right)^2,$$

$$f(x_i) = \begin{cases} 1 & 0.7 \le x_i \\ 0 & \text{otherwise} \end{cases}, g(x_i) = \begin{cases} 1 & 0.5 \le x_i < 0.7 \\ 0 & \text{otherwise} \end{cases};$$

For Exemplary teachers,

$$s_i = f(x_i)\left(\frac{x_i-0.5}{0.6-0.5}\right)^2 + g(x_i) + h(x_i)\left(1-\frac{x_i-0.7}{1-0.7}\right)^2,$$

$$f(x_i) = \begin{cases} 1 & 0.5 \le x_i < 0.6 \\ 0 & \text{otherwise} \end{cases}, g(x_i) = \begin{cases} 1 & 0.6 \le x_i < 0.7 \\ 0 & \text{otherwise} \end{cases}, h(x_i) = \begin{cases} 1 & 0.7 \le x_i \\ 0 & \text{otherwise} \end{cases};$$

For Recognized teachers,

$$s_i = f(x_i)\left(\frac{x_i-0.5}{0.55-0.5}\right)^2 + g(x_i) + h(x_i)\left(1-\frac{x_i-0.6}{1-0.6}\right)^2,$$

$$f(x_i) = \begin{cases} 1 & 0.5 \le x_i < 0.55 \\ 0 & \text{otherwise} \end{cases}, g(x_i) = \begin{cases} 1 & 0.55 \le x_i < 0.6 \\ 0 & \text{otherwise} \end{cases}, h(x_i) = \begin{cases} 1 & 0.6 \le x_i \\ 0 & \text{otherwise} \end{cases};$$

where $s_i$ and $x_i$ are the person $i$'s values on closeness score and growth score, respectively.

*In Check 9*
For Master teachers,

$$s_i = f(x_i) + g(x_i)\left(\frac{x_i - 0.7}{0.9 - 0.7}\right)^2,$$

$$f(x_i) = \begin{cases} 1 & 0.9 \le x_i \\ 0 & \text{otherwise} \end{cases}, g(x_i) = \begin{cases} 1 & 0.7 \le x_i < 0.9 \\ 0 & \text{otherwise} \end{cases};$$

For Exemplary teachers,

$$s_i = f(x_i)\left(\frac{x_i - 0.7}{0.78 - 0.7}\right)^2 + g(x_i) + h(x_i)\left(1 - \frac{x_i - 0.9}{1 - 0.9}\right)^2,$$

$$f(x_i) = \begin{cases} 1 & 0.7 \le x_i < 0.78 \\ 0 & \text{otherwise} \end{cases}, g(x_i) = \begin{cases} 1 & 0.78 \le x_i < 0.9 \\ 0 & \text{otherwise} \end{cases}, h(x_i) = \begin{cases} 1 & 0.9 \le x_i \\ 0 & \text{otherwise} \end{cases};$$

For Recognized teachers,

$$s_i = f(x_i)\left(\frac{x_i - 0.7}{0.74 - 0.7}\right)^2 + g(x_i) + h(x_i)\left(1 - \frac{x_i - 0.78}{1 - 0.78}\right)^2,$$

$$f(x_i) = \begin{cases} 1 & 0.7 \le x_i < 0.74 \\ 0 & \text{otherwise} \end{cases}, g(x_i) = \begin{cases} 1 & 0.74 \le x_i < 0.78 \\ 0 & \text{otherwise} \end{cases}, h(x_i) = \begin{cases} 1 & 0.78 \le x_i \\ 0 & \text{otherwise} \end{cases};$$

where $s_i$ and $x_i$ are the person $i$'s values on closeness score and observation score, respectively.

***<u>Check 10</u>. The proportion of teachers on district campuses who are designated as Recognized, Exemplary, or Master is roughly equivalent to other campuses in the same Domain 2A rating.***

The campus cumulative percentage of (1) Master designation, (2) Exemplary or higher designations, or (3) Recognized or higher designations are each compared to a State average of campuses within each of the Domain 2A categories. In other words, the district and state percentages are obtained for teachers within Domain 2A A-rated campuses, Domain 2A B-rated campus, etc. Then, Cohen's *w* is calculated from each possible comparison in the Domain 2A categories, and a mean value is calculated over the (1), (2), and (3) designation levels.

Cohen's *w* is a measure of association between two nominal variables. With a binary outcome (e.g., designated vs. not designated), it can be written as follows with directionality considered:

$$w = \text{sign}(p_1 - p_0)\sqrt{\frac{(p_1 - p_0)^2}{p_0} + \frac{(p_1 - p_0)^2}{(1 - p_0)}},$$

where $p_1$ is the district percentage and $p_0$ is the statewide expected percentage. The value will be 0 when the district percentage is equal to the statewide percentage for a Domain 2A category. In contrast, the value will be positive when the district percentage is larger than the statewide percentage; or it will be set to zero when the district percentage is smaller than the statewide percentage.

***<u>Check 11.</u> The variability in observation ratings among all eligible teachers is within the range of expected magnitude.***

Standard deviation ($\sigma$) is calculated for the (max-scaled) observation score of all eligible teachers. Standard deviation is a measure of variation or dispersion of a variable, which can be written as:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n}},$$

where $n$ is the sample size; $x_i$ is the person $i$'s values on $x$ (e.g., observation score); and $\bar{x}$ is the sample mean of $x$. A low standard deviation indicates that teachers' observation scores are close to each other and to the mean, while a high standard deviation indicates that scores are spread out over a wider range.

***Check 12. The ranking of teachers based on observation scores closely aligns with their ranking on statewide performance standards for teaching proficiency.***

***Check 13. The ranking of teachers based on percentages of student growth closely aligns with their ranking on statewide performance standards for teaching proficiency.***

Spearman rank correlation coefficient ($\rho$) is calculated between observation scores (Check 12) or growth scores (Check 13) and VAM scores among teachers of tested subjects. Spearman's coefficient is a measure of the strength and direction of monotonic association between the rankings on two variables, which can be written as:

$$\rho_{xy} = \frac{\sum_{i=1}^{n}(Rx_i - R\bar{x})(Ry_i - R\bar{y})}{\sqrt{\sum_{i=1}^{n}(Rx_i - R\bar{x})^2 \sum_{i=1}^{n}(Ry_i - R\bar{y})^2}},$$

where $n$ is the sample size; $Rx_i$ and $Ry_i$ are the person $i$'s ranks on $x$ and $y$ (e.g., $x$ = observation or growth score, $y$ = VAM score); and $R\bar{x}$ and $R\bar{y}$ are the sample means of $Rx$ and $Ry$.

For example, the correlation will be +1 (a perfect positive correlation) when there is a perfect agreement between the rankings of teachers within the district on the observation and VAM scores (i.e., the two rankings are identical). The correlation will be positive when the two rankings are similar. The correlation will be −1 (a perfect negative correlation) when there is a perfect disagreement between the two rankings (i.e., one ranking is the exact opposite of the other). When the two rankings are independent, then the correlation will be close to zero.