

# Mock High School - ELA Teacher Comparative Analysis

*Comparison of Predicted PM3 Scores Across Teachers (Anonymized)*

## 1. Assumptions Testing

### A. Normality Test (Shapiro-Wilk)

H0 (Null Hypothesis): The predicted scores for a given teacher follow a normal distribution.

HA (Alternative Hypothesis): The predicted scores do NOT follow a normal distribution.

Course of Action: If H0 is rejected ( $p < 0.05$ ) for ANY teacher, we must abandon ANOVA and proceed with a Non-Parametric test.

- [v] Teacher A (n=42):  $W=0.969$ ,  $p=0.298$  -> Normal
- [v] Teacher B (n=10):  $W=0.931$ ,  $p=0.460$  -> Normal
- [X] Teacher C (n=119):  $W=0.963$ ,  $p=0.002$  -> Not Normal
- [X] Teacher D (n=87):  $W=0.966$ ,  $p=0.022$  -> Not Normal
- [v] Teacher E (n=62):  $W=0.981$ ,  $p=0.454$  -> Normal
- [v] Teacher F (n=69):  $W=0.984$ ,  $p=0.507$  -> Normal
- [v] Teacher G (n=51):  $W=0.958$ ,  $p=0.069$  -> Normal
- [v] Teacher H (n=68):  $W=0.985$ ,  $p=0.596$  -> Normal
- [v] Teacher I (n=13):  $W=0.937$ ,  $p=0.413$  -> Normal
- [X] Teacher J (n=55):  $W=0.938$ ,  $p=0.007$  -> Not Normal
- [v] Teacher K (n=79):  $W=0.983$ ,  $p=0.374$  -> Normal

**Overall Normality met across all groups? No (3 Violations)**

### B. Homogeneity of Variances Test (Levene's Test)

H0 (Null Hypothesis): The population variances of scores are perfectly equal across all teachers.

Course of Action: If H0 is rejected ( $p < 0.05$ ), we must proceed with a Non-Parametric test.

**Result:  $p=0.626$  -> Equal Variances (H0 Accepted)**

## 2. Main Comparative Test

Decision: Normality assumption violated. Proceeding with Non-Parametric Kruskal-Wallis H-Test.

H0 (Null Hypothesis): The true median scores are exactly equal across all teachers.

HA (Alternative Hypothesis): At least one teacher's median score is statistically significantly different.

**Result:  $H=200.022$ ,  $p=0.0000$**

*>> Conclusion: Significant differences found. Reject H0 and proceed to Post-Hoc Analysis.*

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## 3. Post-Hoc Analysis (Transparent Tables)

### Test: Pairwise Mann-Whitney U Test (with strict Bonferroni Correction)

Showing both unadjusted p-values and Bonferroni Adjusted p-values for full transparency.

Comparison	Unadj. p	Adj. p	Significant?
Teacher A vs Teacher B	0.0324	1.0000	No
Teacher A vs Teacher C	0.9202	1.0000	No
Teacher A vs Teacher D	0.0000	0.0000	Yes
Teacher A vs Teacher E	0.0000	0.0000	Yes
Teacher A vs Teacher F	0.0000	0.0000	Yes
Teacher A vs Teacher G	0.0000	0.0000	Yes
Teacher A vs Teacher H	0.0039	0.2164	No
Teacher A vs Teacher I	0.0000	0.0001	Yes
Teacher A vs Teacher J	0.0000	0.0000	Yes
Teacher A vs Teacher K	0.0411	1.0000	No
Teacher B vs Teacher C	0.0193	1.0000	No
Teacher B vs Teacher D	0.2019	1.0000	No
Teacher B vs Teacher E	0.3364	1.0000	No
Teacher B vs Teacher F	0.2984	1.0000	No
Teacher B vs Teacher G	0.1236	1.0000	No
Teacher B vs Teacher H	0.5349	1.0000	No
Teacher B vs Teacher I	0.0668	1.0000	No
Teacher B vs Teacher J	0.0229	1.0000	No
Teacher B vs Teacher K	0.1850	1.0000	No
Teacher C vs Teacher D	0.0000	0.0000	Yes
Teacher C vs Teacher E	0.0000	0.0000	Yes
Teacher C vs Teacher F	0.0000	0.0000	Yes
Teacher C vs Teacher G	0.0000	0.0000	Yes
Teacher C vs Teacher H	0.0008	0.0421	Yes
Teacher C vs Teacher I	0.0000	0.0000	Yes
Teacher C vs Teacher J	0.0000	0.0000	Yes
Teacher C vs Teacher K	0.0063	0.3449	No
Teacher D vs Teacher E	0.7072	1.0000	No
Teacher D vs Teacher F	0.7092	1.0000	No
Teacher D vs Teacher G	0.1580	1.0000	No
Teacher D vs Teacher H	0.0001	0.0046	Yes
Teacher D vs Teacher I	0.0338	1.0000	No
Teacher D vs Teacher J	0.0014	0.0743	No
Teacher D vs Teacher K	0.0000	0.0000	Yes
Teacher E vs Teacher F	0.4537	1.0000	No
Teacher E vs Teacher G	0.0942	1.0000	No
Teacher E vs Teacher H	0.0009	0.0492	Yes
Teacher E vs Teacher I	0.0205	1.0000	No
Teacher E vs Teacher J	0.0009	0.0492	Yes
Teacher E vs Teacher K	0.0000	0.0004	Yes
Teacher F vs Teacher G	0.2871	1.0000	No
Teacher F vs Teacher H	0.0001	0.0048	Yes

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Teacher F vs Teacher I	0.0552	1.0000	No
Teacher F vs Teacher J	0.0088	0.4818	No
Teacher F vs Teacher K	0.0000	0.0000	Yes
Teacher G vs Teacher H	0.0000	0.0004	Yes
Teacher G vs Teacher I	0.2135	1.0000	No
Teacher G vs Teacher J	0.2210	1.0000	No
Teacher G vs Teacher K	0.0000	0.0000	Yes
Teacher H vs Teacher I	0.0003	0.0145	Yes
Teacher H vs Teacher J	0.0000	0.0000	Yes
Teacher H vs Teacher K	0.3470	1.0000	No
Teacher I vs Teacher J	0.8760	1.0000	No
Teacher I vs Teacher K	0.0000	0.0011	Yes
Teacher J vs Teacher K	0.0000	0.0000	Yes