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Tamhanes T2 Unequal-Variance Post Hoc Analysis

Tamhanes T2 Unequal-Variance Post Hoc Analysis
Import dataset.csv from the Tamhanes T2 folder

Tamhanes T2 Group Descriptive Statistics

Tamhanes T2 Group Descriptive Statistics
Group descriptives for G3 by studytime

Means

[TamhanesT2Data] D:\DATA ANALYSIS\F Post Hoc Tests\Tamhanes T2\SPSS_Output\sav
\Tamhanes-T2-data.sav

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Final grade / dependent variable * Weekly study time group / Tamhane T2 post hoc factor	649	100.0%	0	0.0%	649	100.0%

Report

Final grade / dependent variable

Weekly study time group / Tamhane T2 post hoc factor	N	Mean	Std. Deviation	Variance	Minimum	Maximum
<2 hours	212	10.84	3.219	10.360	0	18
2 to 5 hours	305	12.09	3.243	10.518	0	19
5 to 10 hours	97	13.23	2.502	6.261	8	18
>10 hours	35	13.06	3.038	9.232	6	19
Total	649	11.91	3.231	10.437	0	19

Variance and Distribution Context Before Tamhanes T2

Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context

Explore

Weekly study time group / Tamhane T2 post hoc factor

Case Processing Summary

	Weekly study time group / Tamhane T2 post hoc factor	Cases			
		Valid		Missing	
		N	Percent	N	Percent
Final grade / dependent variable	<2 hours	212	100.0%	0	0.0%
	2 to 5 hours	305	100.0%	0	0.0%
	5 to 10 hours	97	100.0%	0	0.0%
	>10 hours	35	100.0%	0	0.0%

Case Processing Summary

	Weekly study time group / Tamhane T2 post hoc factor	Cases	
		Total	
		N	Percent
Final grade / dependent variable	<2 hours	212	100.0%
	2 to 5 hours	305	100.0%
	5 to 10 hours	97	100.0%
	>10 hours	35	100.0%

Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context

Descriptives

	Weekly study time group / Tamhane T2 post hoc factor	Statistic			
Final grade / dependent variable	<2 hours	Mean	10.84		
		95% Confidence Interval for Mean	Lower Bound	10.41	
			Upper Bound	11.28	
		5% Trimmed Mean	11.04		
		Median	11.00		
		Variance	10.360		
		Std. Deviation	3.219		
		Minimum	0		
		Maximum	18		
		Range	18		
		Interquartile Range	3		
		Skewness	-1.078		
		Kurtosis	3.117		
		2 to 5 hours	2 to 5 hours	Mean	12.09
				95% Confidence Interval for Mean	Lower Bound
Upper Bound	12.46				
5% Trimmed Mean	12.25				
Median	12.00				
Variance	10.518				
Std. Deviation	3.243				
Minimum	0				
Maximum	19				
Range	19				
Interquartile Range	4				
Skewness	-1.028				
Kurtosis	3.044				
5 to 10 hours	5 to 10 hours			Mean	13.23
				95% Confidence Interval for Mean	Lower Bound
		Upper Bound	13.73		
		5% Trimmed Mean	13.27		
		Median	13.00		
		Variance	6.261		

Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context

Descriptives

	Weekly study time group / Tamhane T2 post hoc factor		Std. Error		
Final grade / dependent variable	<2 hours	Mean	.221		
		95% Confidence Interval for Mean	Lower Bound		
			Upper Bound		
		5% Trimmed Mean			
		Median			
		Variance			
		Std. Deviation			
		Minimum			
		Maximum			
		Range			
		Interquartile Range			
		Skewness	.167		
		Kurtosis	.333		
		2 to 5 hours	2 to 5 hours	Mean	.186
				95% Confidence Interval for Mean	Lower Bound
Upper Bound					
5% Trimmed Mean					
Median					
Variance					
Std. Deviation					
Minimum					
Maximum					
Range					
Interquartile Range					
Skewness	.140				
Kurtosis	.278				
5 to 10 hours	5 to 10 hours			Mean	.254
				95% Confidence Interval for Mean	Lower Bound
		Upper Bound			
		5% Trimmed Mean			
		Median			
		Variance			

Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context

Descriptives

Weekly study time group / Tamhane T2 post hoc factor		Statistic
	Std. Deviation	2.502
	Minimum	8
	Maximum	18
	Range	10
	Interquartile Range	4
	Skewness	-.190
	Kurtosis	-.502
>10 hours	Mean	13.06
	95% Confidence Interval for Mean	Lower Bound 12.01 Upper Bound 14.10
	5% Trimmed Mean	13.07
	Median	13.00
	Variance	9.232
	Std. Deviation	3.038
	Minimum	6
	Maximum	19
	Range	13
	Interquartile Range	4
	Skewness	.209
	Kurtosis	-.339

Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context

Descriptives

Weekly study time group / Tamhane T2 post hoc factor		Std. Error
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.245
	Kurtosis	.485
>10 hours	Mean	.514
	95% Confidence Interval for Mean	Lower Bound Upper Bound
	5% Trimmed Mean	
	Median	
	Variance	
	Std. Deviation	
	Minimum	
	Maximum	
	Range	
	Interquartile Range	
	Skewness	.398
	Kurtosis	.778

Tests of Normality

	Weekly study time group / Tamhane T2 post hoc factor	Kolmogorov-Smirnov ^a			Shapiro-...
		Statistic	df	Sig.	Statistic
Final grade / dependent variable	<2 hours	.161	212	.000	.898
	2 to 5 hours	.125	305	.000	.917
	5 to 10 hours	.103	97	.013	.970
	>10 hours	.136	35	.099	.955

Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context

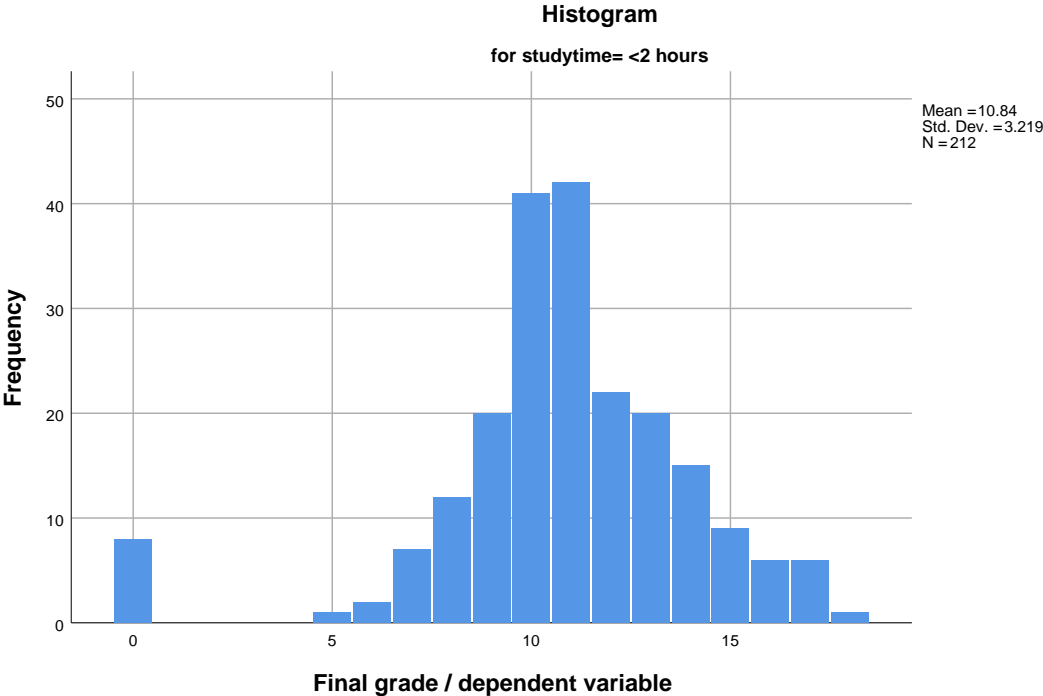
Tests of Normality

Final grade / dependent variable	Weekly study time group / Tamhane T2 post hoc factor	Shapiro-Wilk	
		df	Sig.
Final grade / dependent variable	<2 hours	212	.000
	2 to 5 hours	305	.000
	5 to 10 hours	97	.025
	>10 hours	35	.166

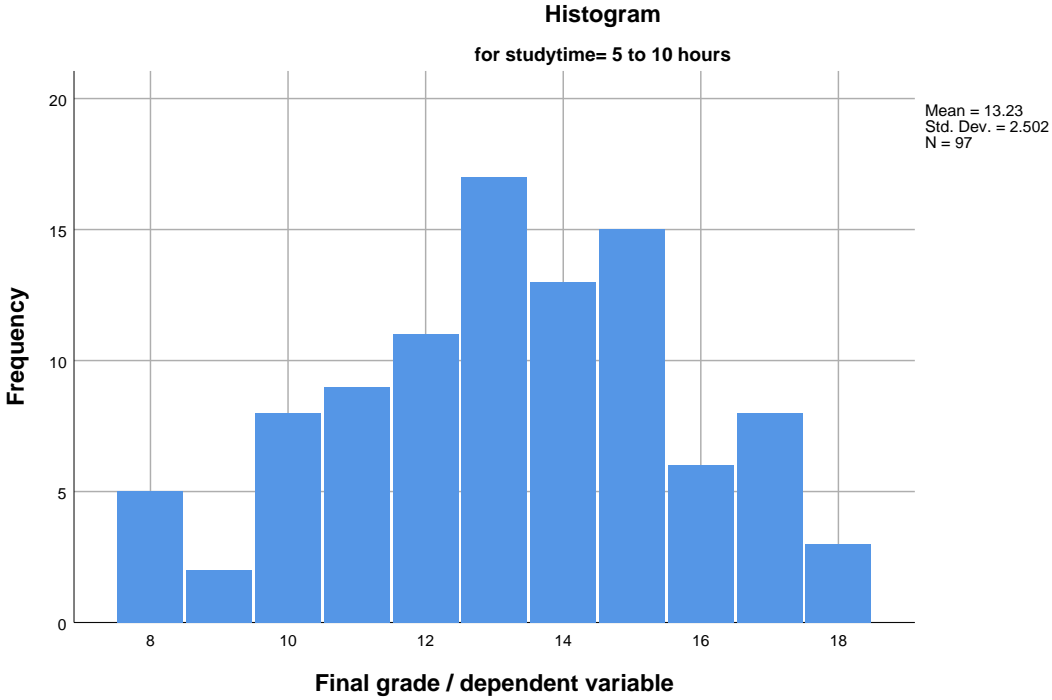
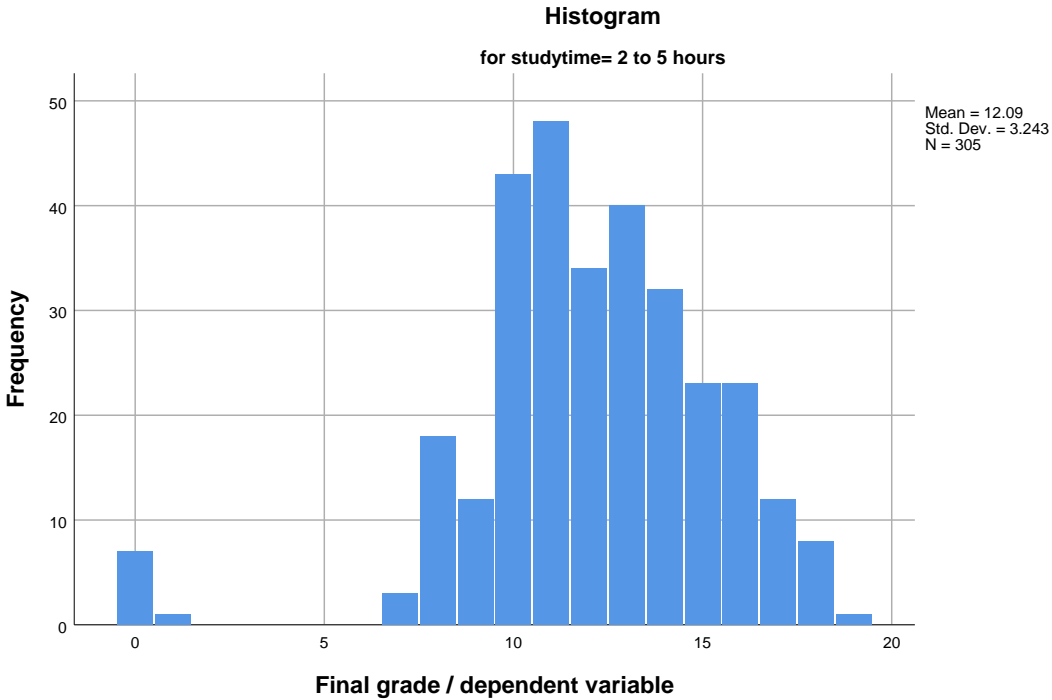
a. Lilliefors Significance Correction

Final grade / dependent variable

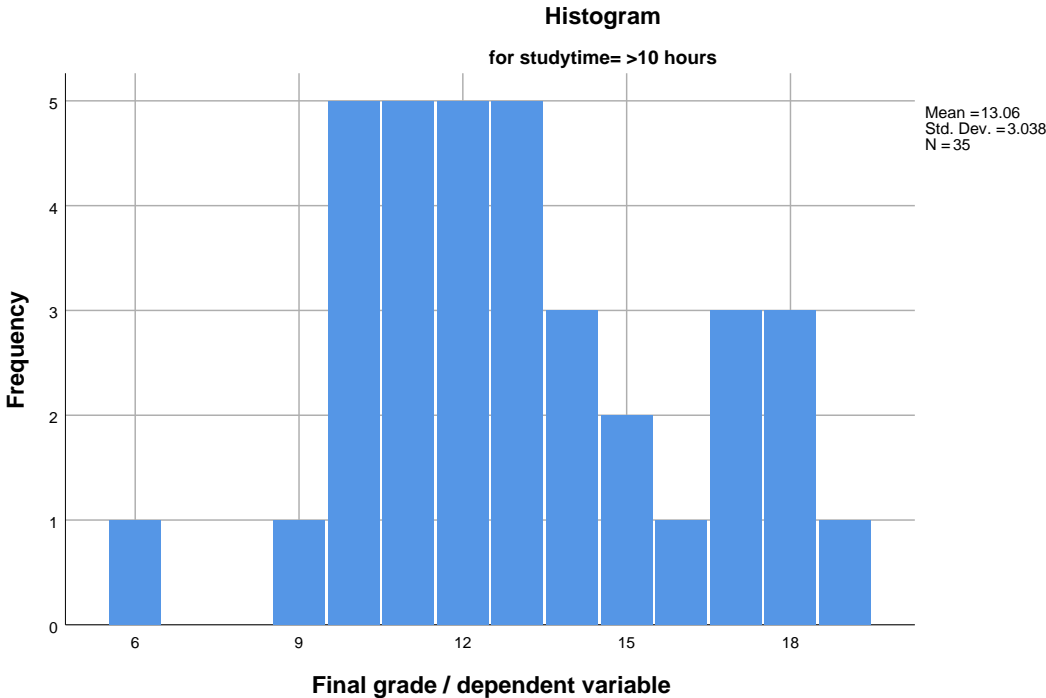
Histograms



Variance and Distribution Context Before Tamhanes T2
Boxplot, histogram, normality plot, and variance context

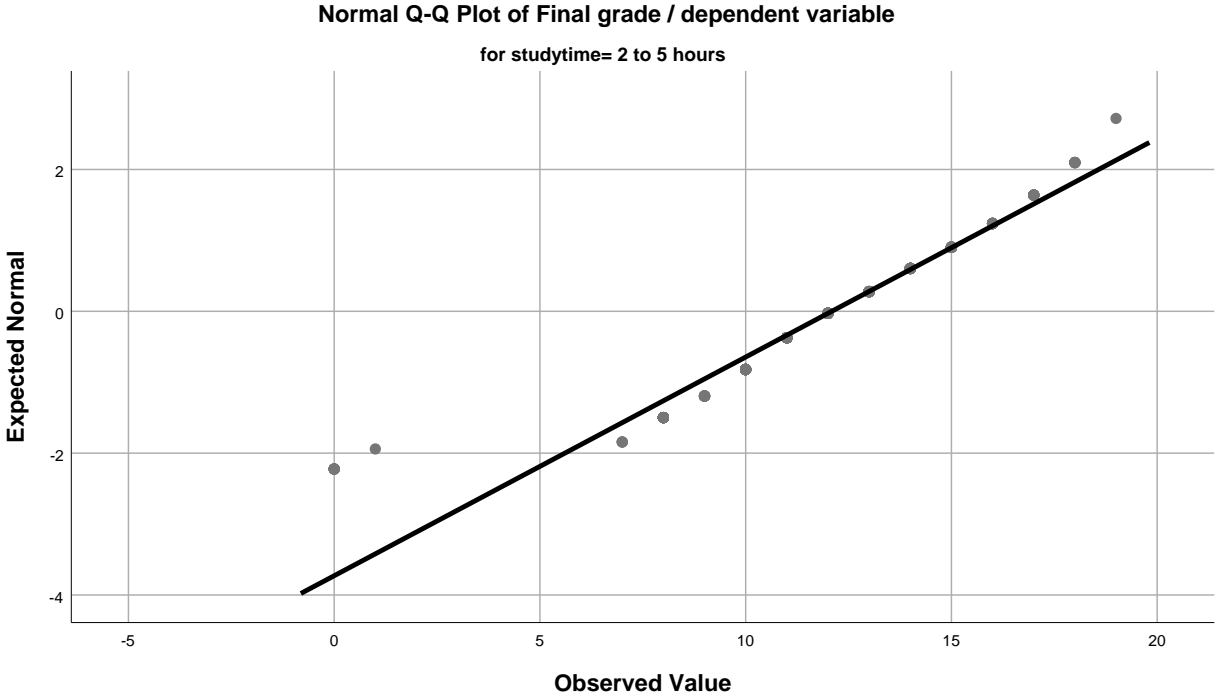
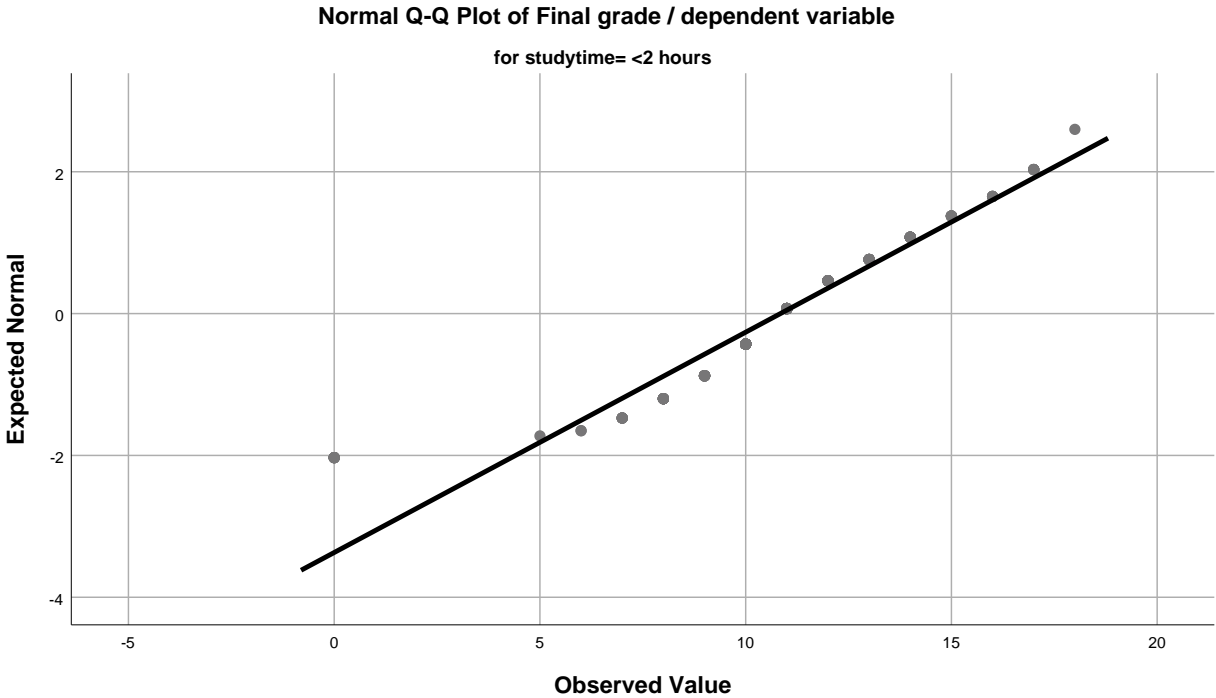


Variance and Distribution Context Before Tamhanes T2
Boxplot, histogram, normality plot, and variance context

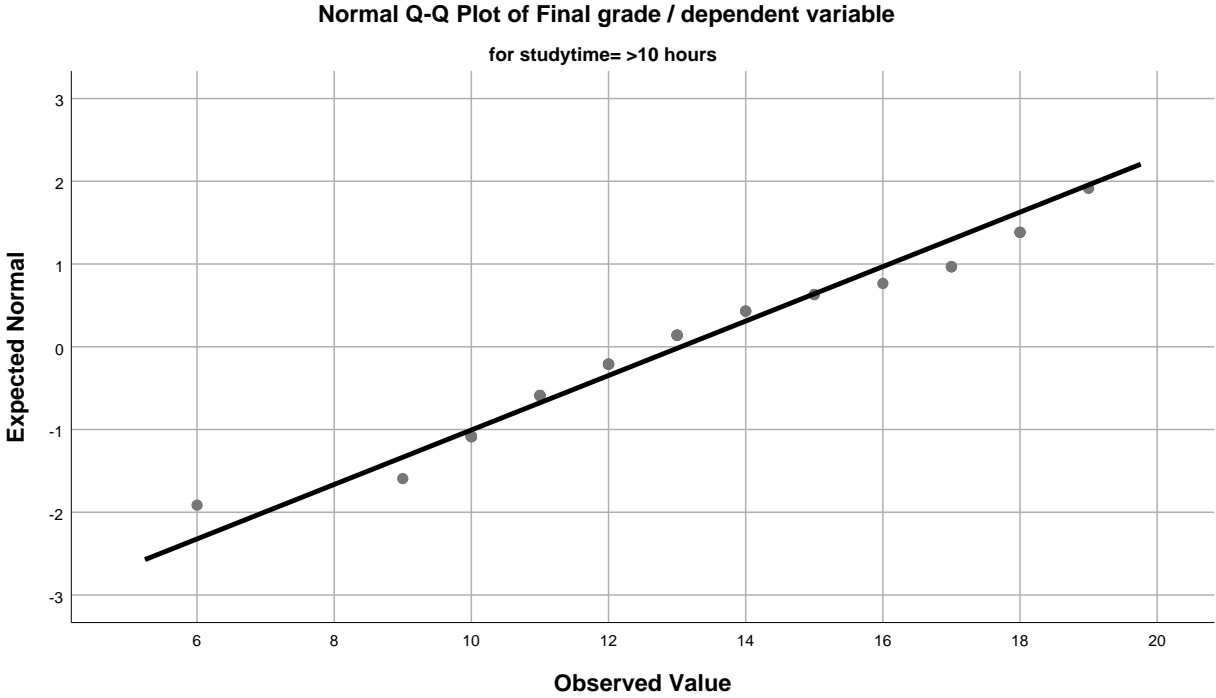
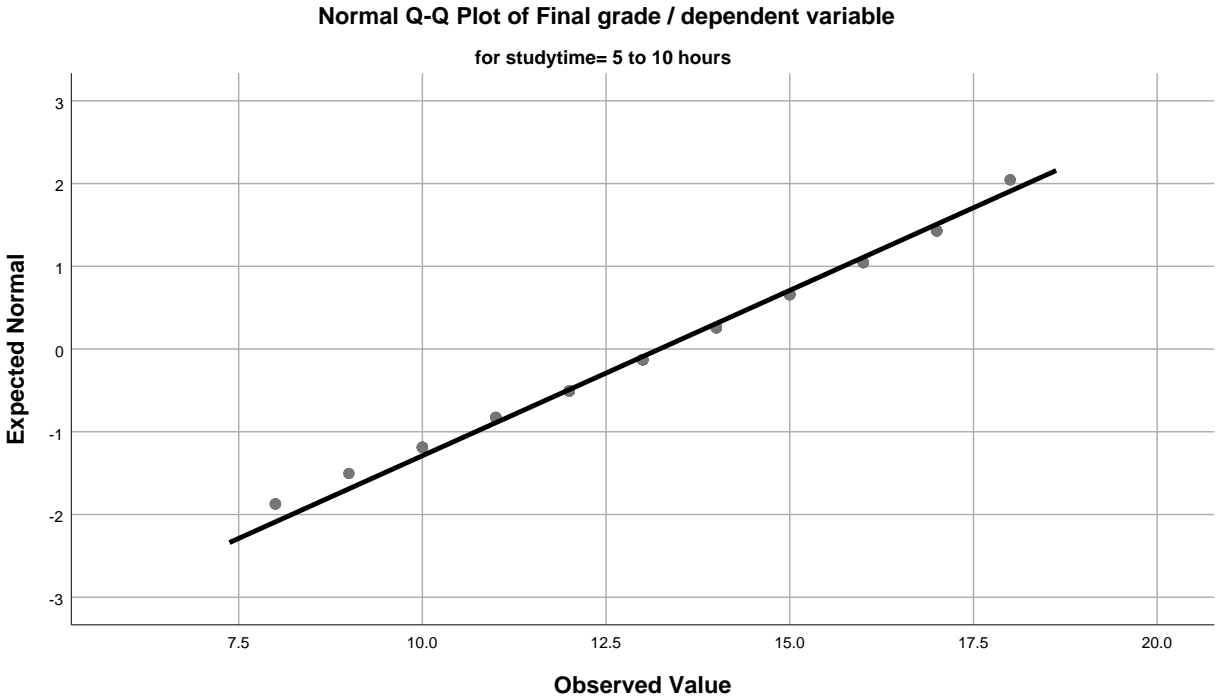


Normal Q-Q Plots

Variance and Distribution Context Before Tamhanes T2
Boxplot, histogram, normality plot, and variance context

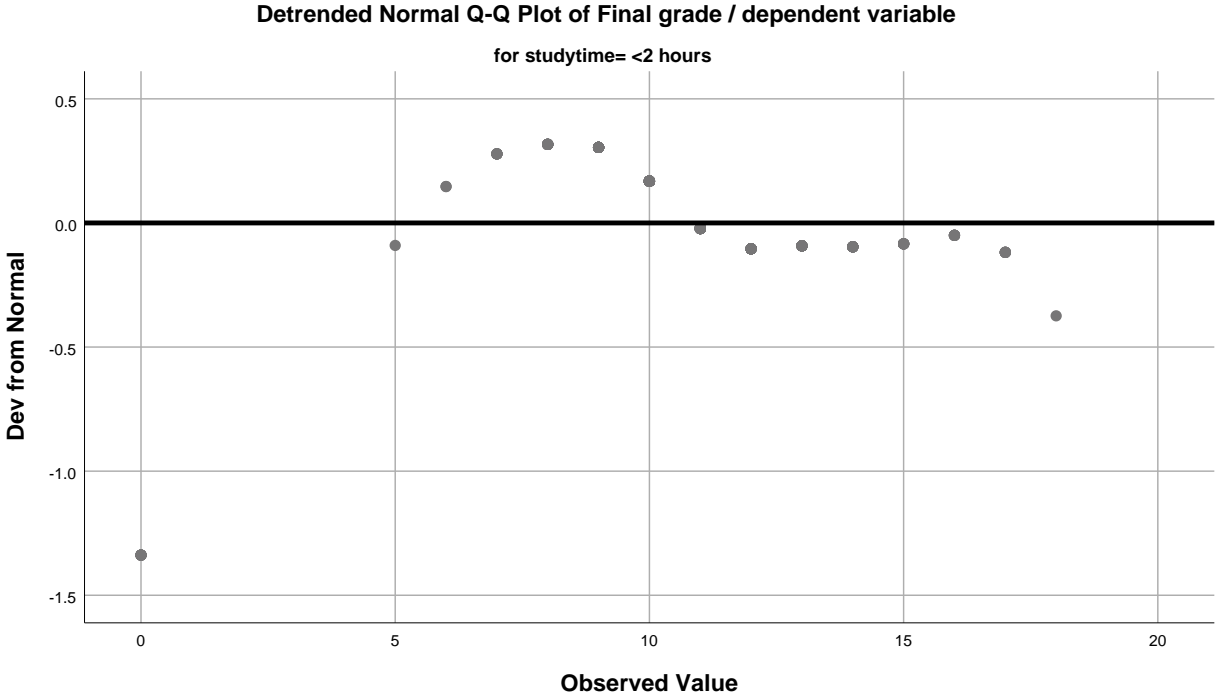


Variance and Distribution Context Before Tamhanes T2
Boxplot, histogram, normality plot, and variance context

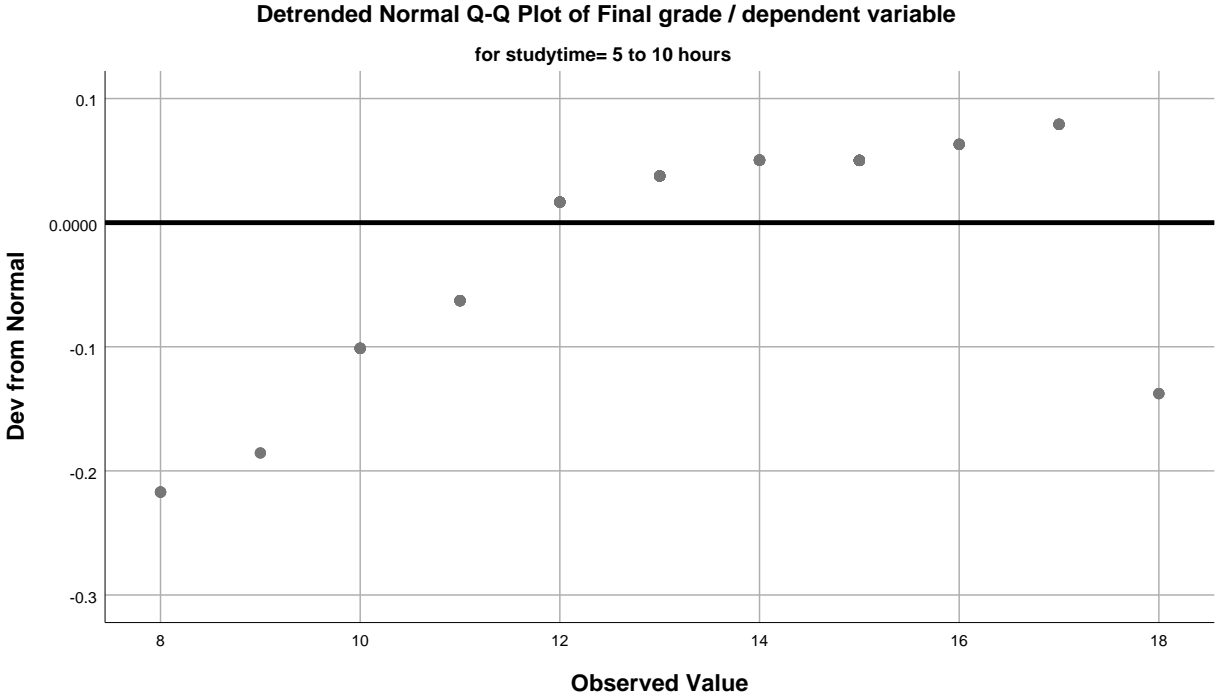
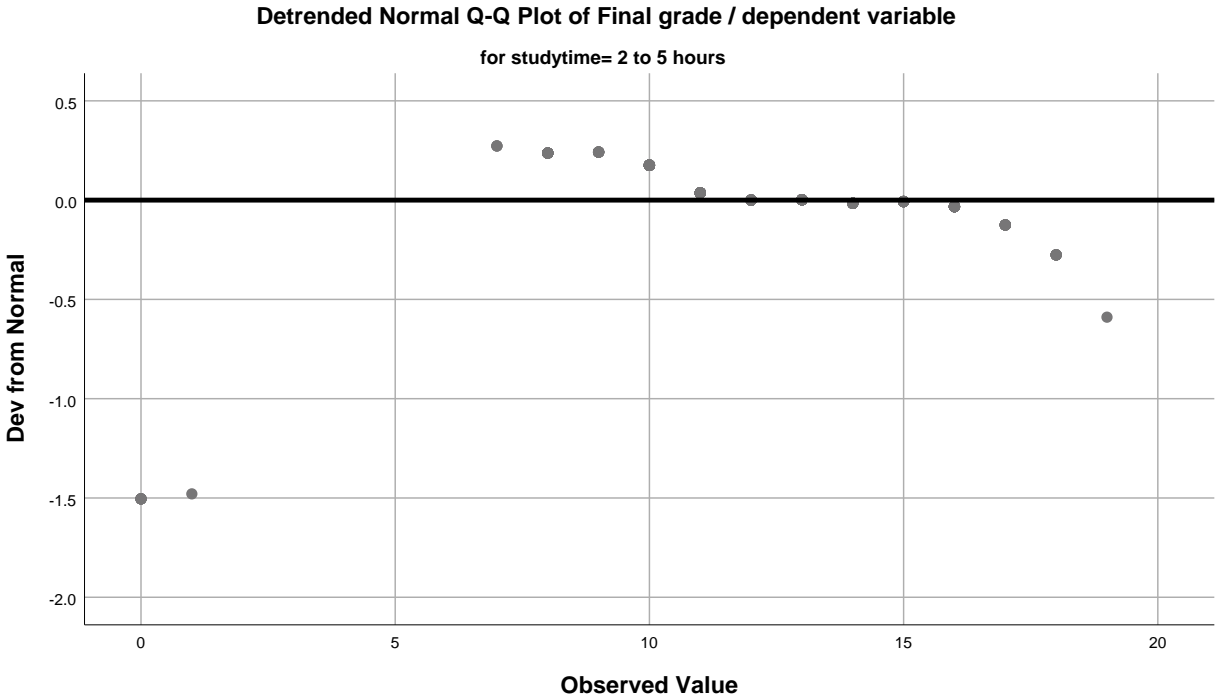


Variance and Distribution Context Before Tamhanes T2
Boxplot, histogram, normality plot, and variance context

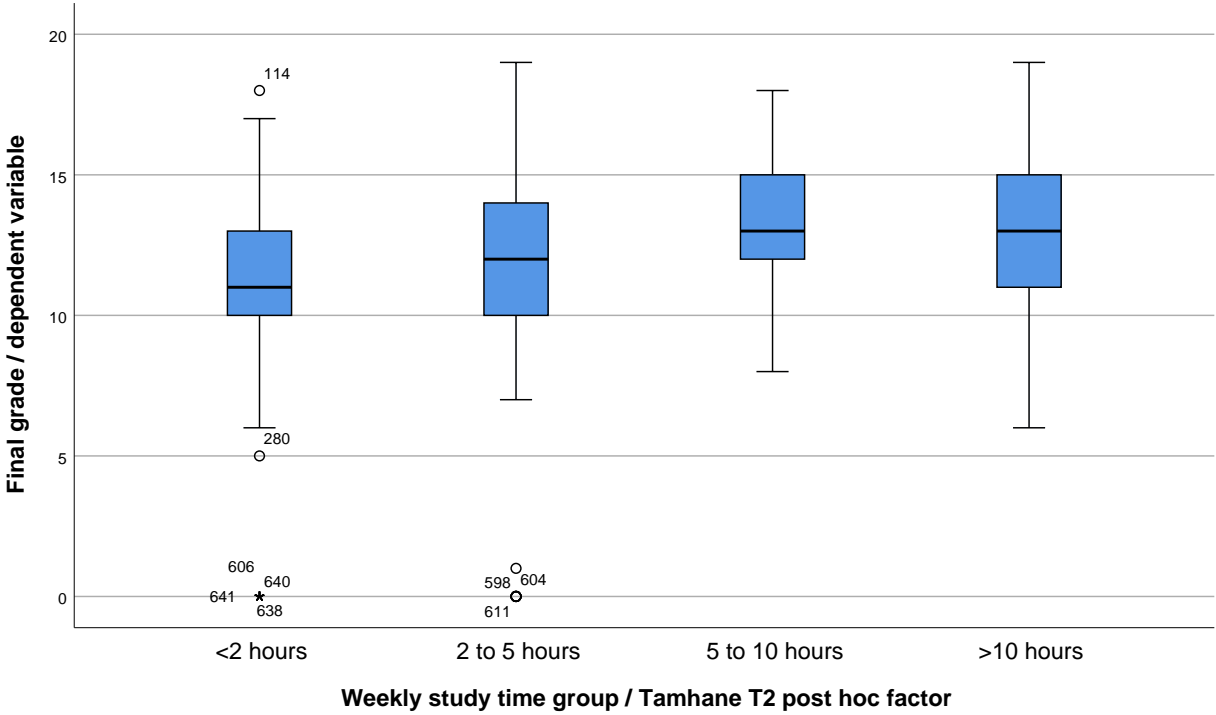
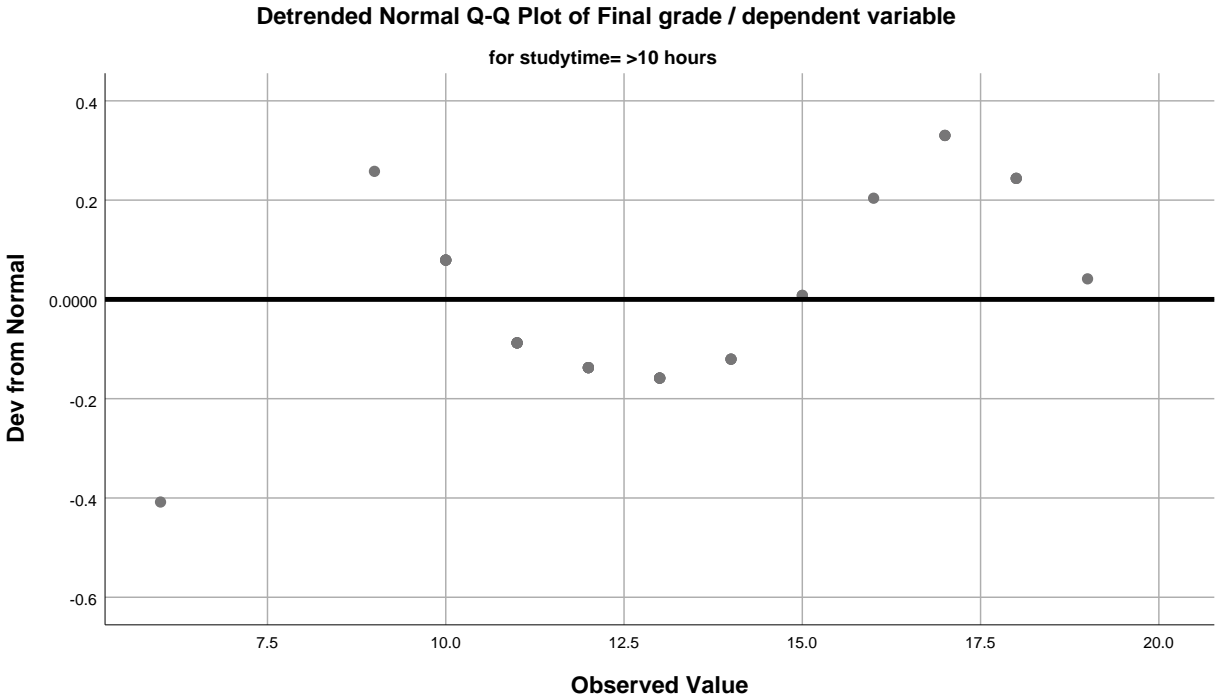
Detrended Normal Q-Q Plots



Variance and Distribution Context Before Tamhanes T2
Boxplot, histogram, normality plot, and variance context



Variance and Distribution Context Before Tamhanes T2
 Boxplot, histogram, normality plot, and variance context



One-Way ANOVA with Homogeneity and Welch Context

```
>Warning # 2004. Command name: SUBTITLE  
>The subtitle given exceeds 60 characters in length. The first 60 characters  
>will be used.
```

One-Way ANOVA with Homogeneity and Welch Context
 Dependent variable: G3; factor: studytime; robust context be

Oneway

Descriptives

Final grade / dependent variable

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
<2 hours	212	10.84	3.219	.221	10.41	11.28
2 to 5 hours	305	12.09	3.243	.186	11.73	12.46
5 to 10 hours	97	13.23	2.502	.254	12.72	13.73
>10 hours	35	13.06	3.038	.514	12.01	14.10
Total	649	11.91	3.231	.127	11.66	12.16

Descriptives

Final grade / dependent variable

	Minimum	Maximum
<2 hours	0	18
2 to 5 hours	0	19
5 to 10 hours	8	18
>10 hours	6	19
Total	0	19

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Final grade / dependent variable	Based on Mean	.985	3	645	.400
	Based on Median	1.026	3	645	.380
	Based on Median and with adjusted df	1.026	3	609.885	.380
	Based on trimmed mean	1.081	3	645	.356

One-Way ANOVA with Homogeneity and Welch Context
 Dependent variable: G3; factor: studytime; robust context be

ANOVA

Final grade / dependent variable

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	465.078	3	155.026	15.876	.000
Within Groups	6298.189	645	9.765		
Total	6763.267	648			

Robust Tests of Equality of Means

Final grade / dependent variable

	Statistic ^a	df1	df2	Sig.
Welch	18.183	3	139.101	.000

a. Asymptotically F distributed.

Tamhanes T2 Unequal-Variance Pairwise Comparisons

Tamhanes T2 Unequal-Variance Pairwise Comparisons
Official SPSS post hoc method: /POSTHOC=TAMHANEALPHA(0.05)

Oneway

Warnings

The test name TAMHANE was not recognized on the POSTHOC subcommand. The following tests can be specified: SNK, TUKEY, BTUKEY, DUNCAN, SCHEFFE, DUNNETT, DUNNETTL, DUNNETTR, BONFERRO, LSD, SIDAK, GT2, GABRIEL, FREGW, QREGW, T2, T3, GH, C, WALLER.

Execution of this command stops.

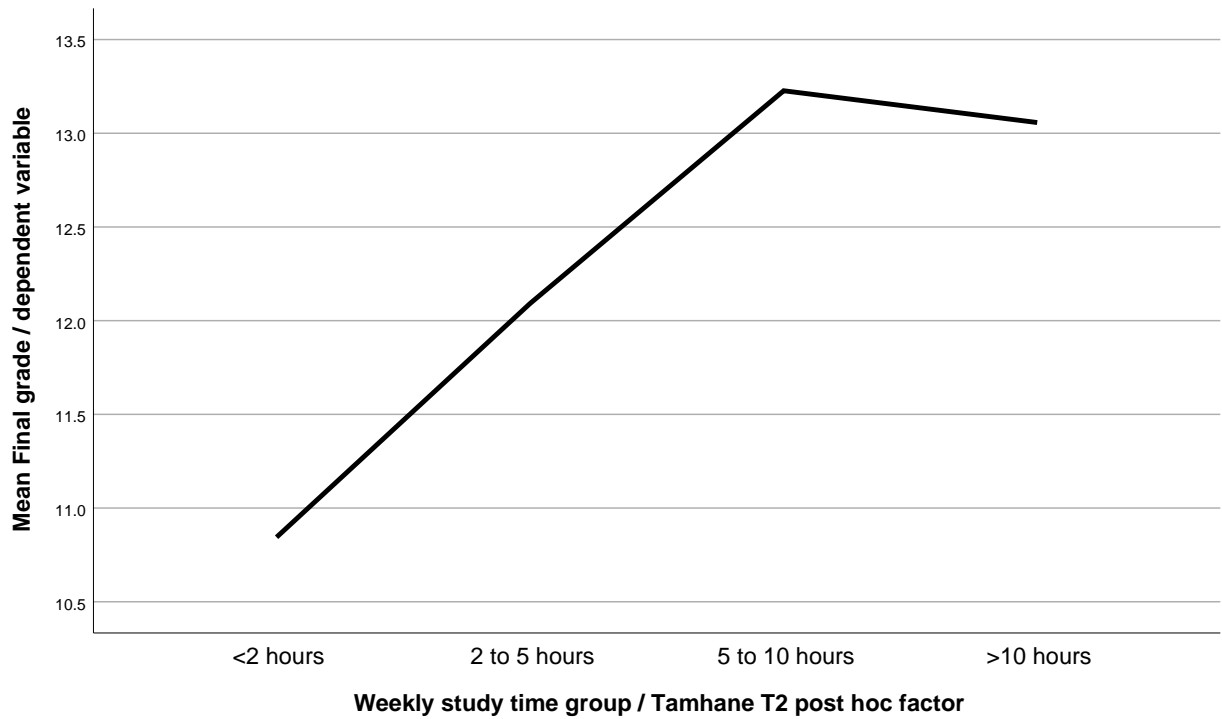
Tamhanes T2 Visual Context: Mean Profile

Graph

>Warning # 17849

>The requested line chart type cannot be drawn with the provided data.

>Instead, Graphics will attempt to draw a simple line chart.



Tamhanes T2 Visual Context: Group Boxplots

Graph

```
>Error # 17804 in column 4. Text: BOXPLOT
>Unrecognized subcommand was found. Recognized subcommands are: TITLE,
>SUBTITLE, FOOTNOTE, BAR, PIE, LINE, HISTOGRAM, SCATTERPLOT, HILO, ERRORBAR and
>TEMPLATE. Skipping to a "/".
>Execution of this command stops.
```