The Thurgood Marshall School of Law Empirical Findings: A Report of the Watson-Glaser for the 2009-2010 test takers

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EXECUTIVE SUMMARY

The following report gives the statistical findings of the 2009-2010 Watson-Glaser test. Data is pre-existing and was given to the Evaluator by email from the Director, Center for Legal Pedagogy. Statistical analyses were run using SPSS 17 to address the following questions:

1. What are the statistical descriptors of the Watson-Glaser results of student Pre-Test and Post-Test (Within and Between)?

2. What is the relationship of the categories (Inference Making – IM, Assumption Recognition – AR, Deductive Reasoning – DR, Interpretation – IN, and Argument Evaluation - AE) of the Watson-Glaser Pre and Post Test data?

3. What categories indicated statistically significant differences from Pre to Post Test?

Findings, summaries, and conclusive statements are also written as side notes within the appendices of this report/study. Those and the following summaries specifically address each research question and possible implications.

Procedures
A group of students independently took the Watson-Glaser Pre-Test (N=200) in August 2009 during the orientation week for their 1st year as TMSL students. Of that same group, 90 independently took the Post Test towards the end of the semester. The data was matched to the individuals and the findings are reported:

Findings
Summary of Findings for Research Question 1: The Median measure is the best indicator of group data in this situation. Hence the Medians Total Score reported are 59 for Pre-Test Takers who took Post-Test (N=90), 59 for Pre-Test Takers whom did not take the Post –Test (N=110), and a Post-Test Median Final Score of 50. It was found that the Final Score Median declined 9 points from Pre to Post Tests results. (See the Histograms in Appendix 1 for a better visual description of Data.)

Summary of Findings for Research Question 2: The relationship measure here is indicated by a paired sample correlations (N=90). This measure could only be given

from those whom took both the Pre and Post Test. There were 2 significant relationships: The AR-AR2 and the AE-AE2 ($p \leq .05$). Please note that the other correlational coefficients were too small to indicate any significant level of relationship. Also note there is a negative yet insignificant relationship with DR-DR2.

Summary of Research Question 3: The statistically significant measure here is indicated by a paired sample tests (N=90). This measure could only be given from those whom took both the Pre and Post Test. There were statistically significant differences given for ALL of the measured Pre and Post Tests categories when using a Paired Sampled Test (see Appendix 3). It is necessary to note that these differences are non directional but an investigation of the means would indicate that the significant difference was negative. After further investigation by the evaluator it was determined that the Pre and Post Tests were not administered with the same standards. This difference can also show up on the data when a very valid and highly reliable instrument is used (such as the Watson-Glaser). It is a final recommendation that future administrations of the tests follow similar protocols in order to provide more useful data.

Conclusions

The findings this report will be used as information in Professional Development workshops in order to help Faculty/Staff see the impact of the Law School 1st year process on the student's Inference Making – IM, Assumption Recognition – AR, Deductive Reasoning – DR, Interpretation – IN, and Argument Evaluation – AE skills. All of which are considered high need skills for a successful lawyer.

Appendix 1

Findings for Question 1: **What are the statistical descriptors of the Watson-Glaser results of student Pre-Test and Post-Test (Within and Between)?**

Test Takers Statistics for Watson Glaser August 2009

		IM	AR	DR	IN
N	Valid	90	90	90	90
	Missing	0	0	0	0
Mean		9.87	12.32	11.56	12.62
Median		10.00	13.00	12.00	13.00
Std. Deviation		2.423	3.097	2.249	1.858
Skewness		.004	-1.704	-.456	-.633
Std. Error of Skewness		.254	.254	.254	.254
Minimum		5	0	6	8
Maximum		15	16	15	16
Percentiles	25	8.00	12.00	10.00	11.00
	50	10.00	13.00	12.00	13.00
	75	12.00	14.00	13.00	14.00

		AE	TOT
N	Valid	90	90
	Missing	0	0
Mean		12.26	58.61
Median		13.00	59.00
Std. Deviation		3.161	7.018
Skewness		-2.321	-.369
Std. Error of Skewness		.254	.254
Minimum		0	41
Maximum		16	74
Percentiles	25	12.00	54.00
	50	13.00	59.00
	75	14.00	64.00

Non-Test Takers of Post Test Statistics for Watson Glaser August 2009

		IM	AR	DR	IN
N	Valid	110	110	110	110
	Missing	0	0	0	0
Mean		9.99	11.80	11.41	12.11
Median		10.00	13.00	12.00	12.00
Std. Deviation		2.414	3.850	2.700	2.207
Skewness		-.069	-1.225	-1.106	-.725
Std. Error of Skewness		.230	.230	.230	.230
Minimum		4	1	0	4
Maximum		15	16	16	16
Percentiles	25	8.00	10.00	10.00	11.00
	50	10.00	13.00	12.00	12.00
	75	11.00	15.00	13.00	14.00

		AE	TOT
N	Valid	110	110
	Missing	0	0
Mean		12.39	57.70
Median		13.00	59.00
Std. Deviation		2.696	8.235
Skewness		-2.506	-.445
Std. Error of Skewness		.230	.230
Minimum		0	34
Maximum		16	74
Percentiles	25	11.00	52.00
	50	13.00	59.00
	75	14.00	63.25

Watson Glaser Post Test Takers Spring 2010

		IM2	AR2	DR2	IN2
N	Valid	90	90	90	90
	Missing	0	0	0	0
Mean		7.34	10.86	9.63	10.56
Median		8.00	11.00	10.00	11.00
Std. Deviation		2.748	3.157	2.628	3.145
Skewness		-.177	-.743	-.676	-.525
Std. Error of Skewness		.254	.254	.254	.254
Minimum		1	2	0	3
Maximum		13	16	16	16
Percentiles	25	5.00	9.00	8.00	8.75
	50	8.00	11.00	10.00	11.00
	75	10.00	13.00	11.00	13.00

		AE2	TOT2
N	Valid	90	90
	Missing	0	0
Mean		10.41	48.80
Median		11.00	50.00
Std. Deviation		2.548	9.853
Skewness		-.236	-.745
Std. Error of Skewness		.254	.254
Minimum		4	21
Maximum		16	70
Percentiles	25	9.00	43.75
	50	11.00	50.00
	75	12.00	56.25

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Summary of Research Question 1: The Median measure is the best indicator of group data in this situation. Hence the Medians Total Score reported are 59 for Pre-Test Takers who took Post-Test (N=90), 59 for Pre-Test Takers whom did not take the Post – Test (N=110), and a Post-Test Median Final Score of 50. Note, that the Final Score Median declined 9 points from Pre to Post Tests.

See the following Histograms for a better visual description of Data.

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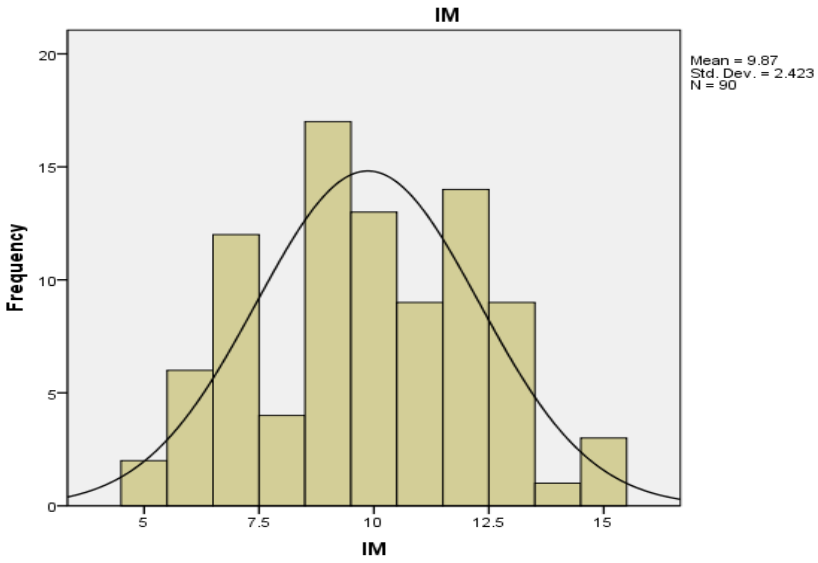
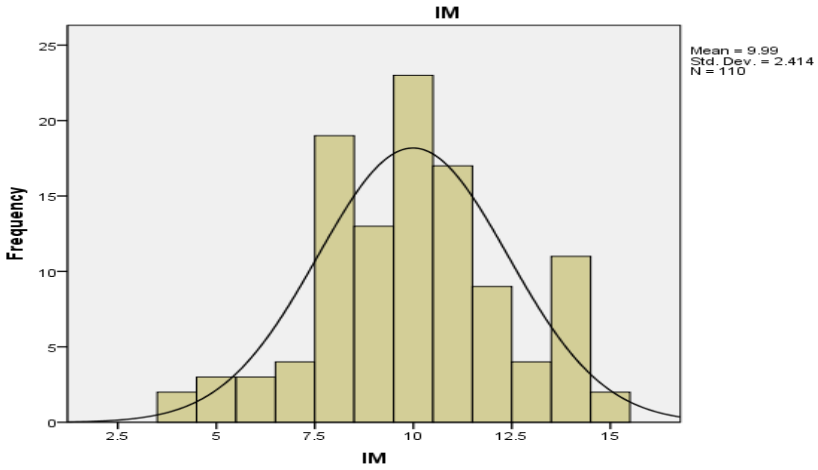
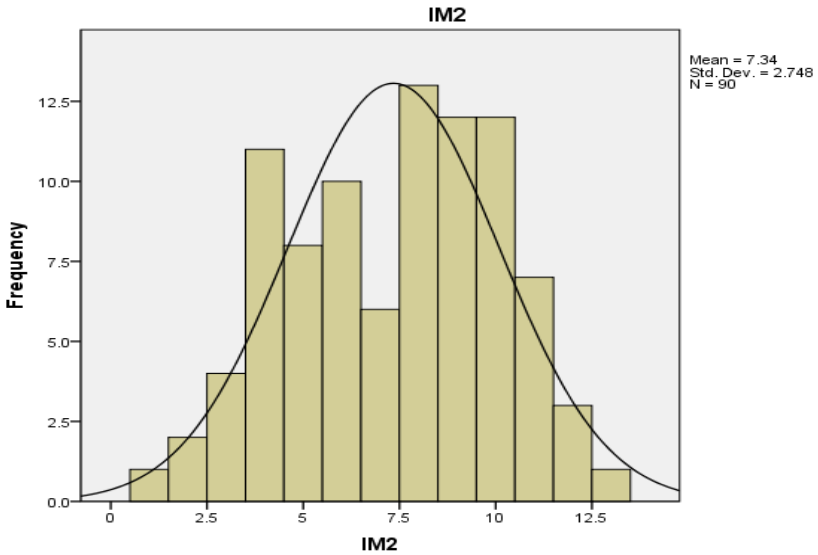


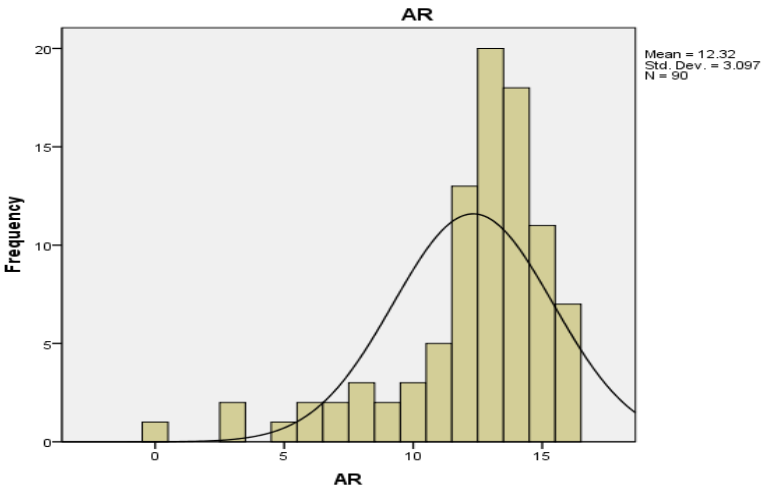
1st Histogram represents Pre-Test Takers whom took the Post-Test (N=90)



2nd Histogram represents Pre-Test Takers whom did not take the Post Test (N=110)



3rd Histogram represents Post-Test Takers (N=90)



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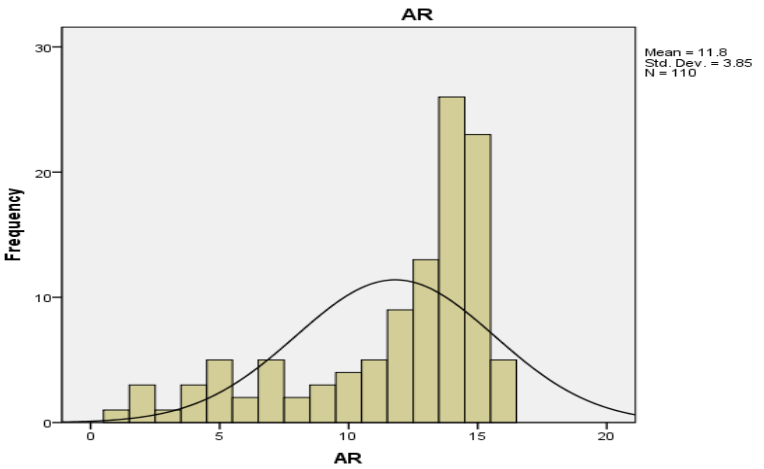
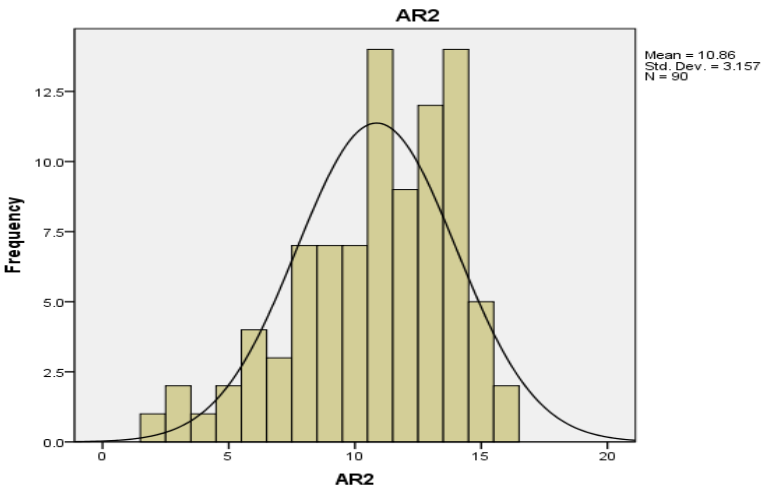


2nd Histogram represents Pre-Test Takers whom did not take the Post Test (N=110)



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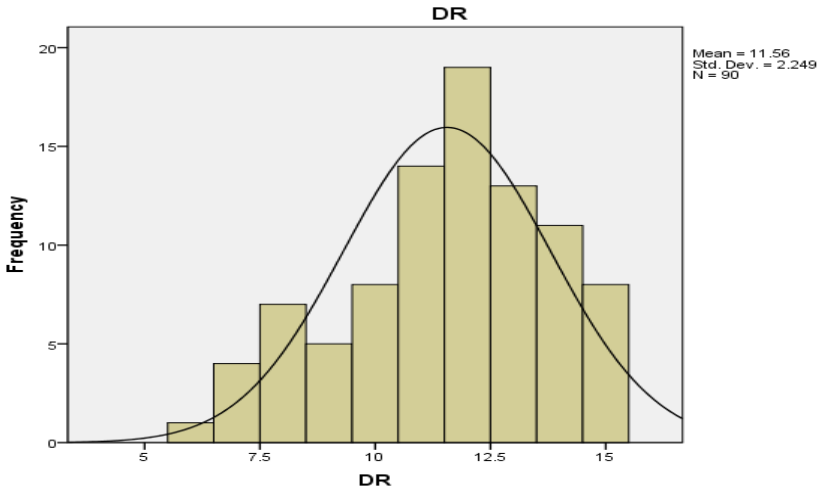
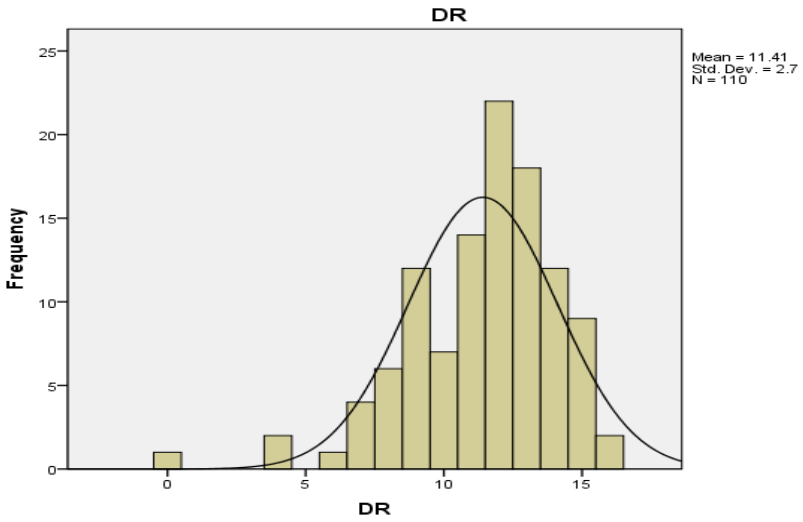


1st Histogram represents Pre-Test Takers whom took the Post-Test (N=90)



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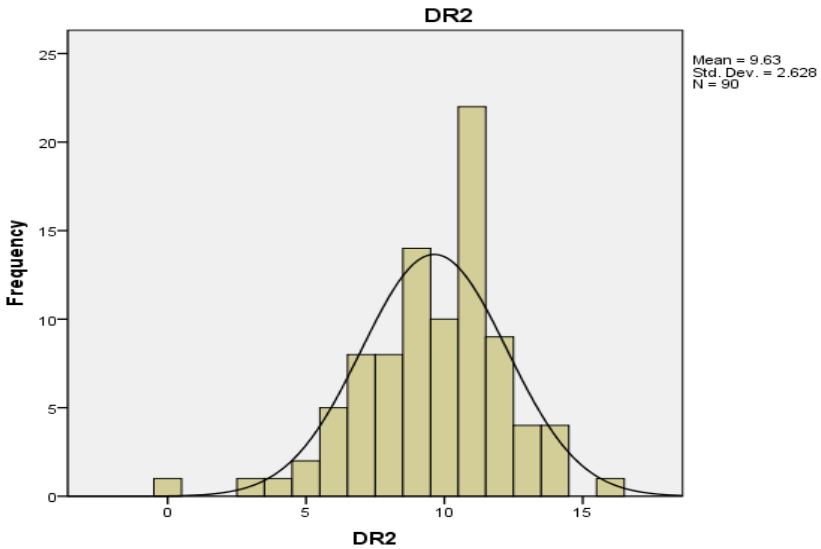

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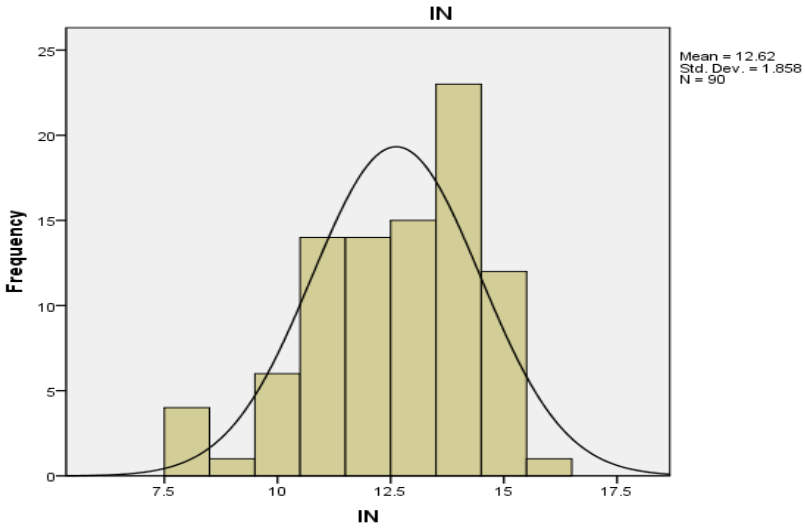

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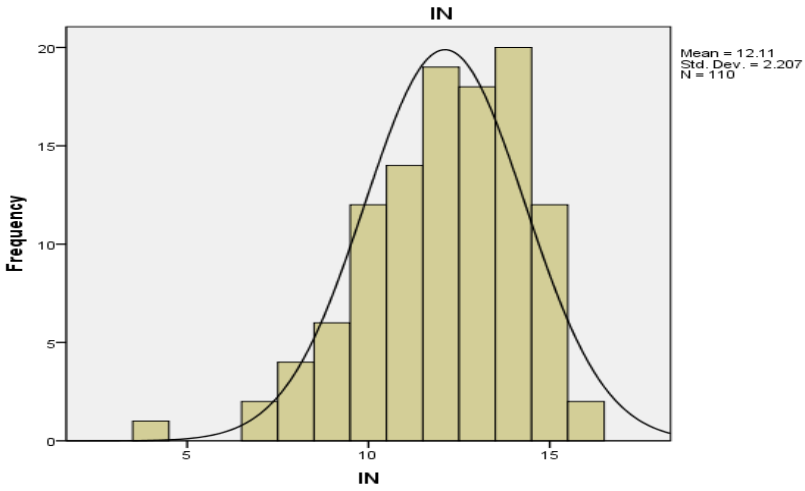

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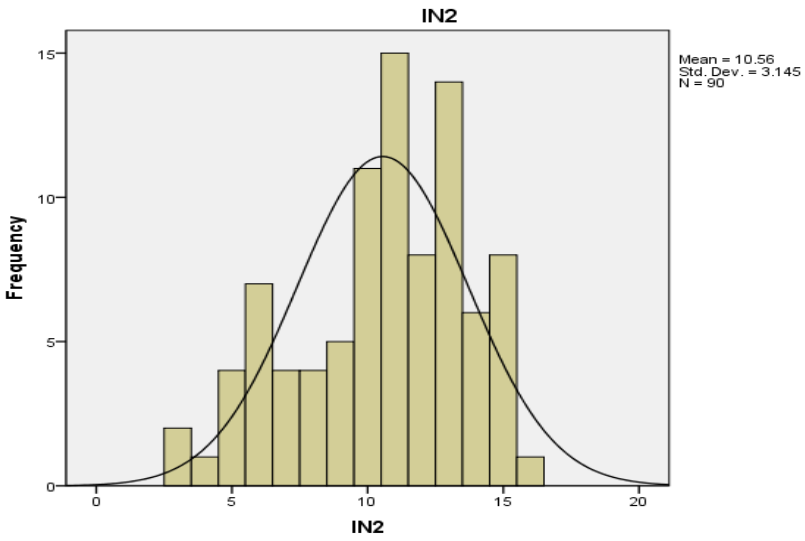

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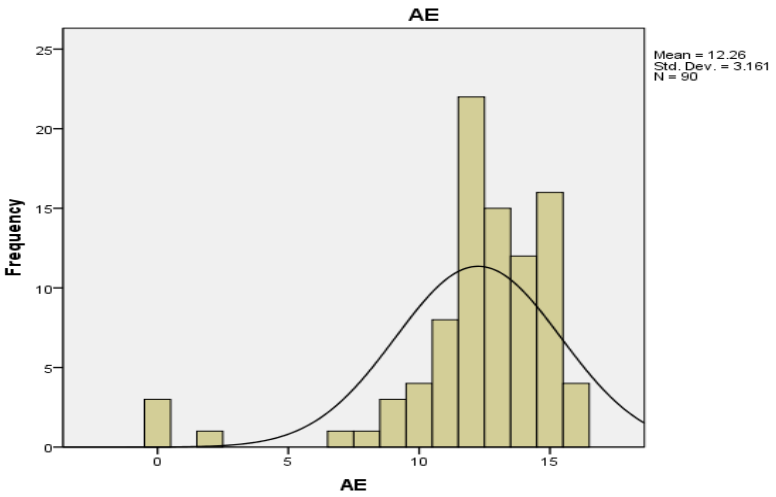

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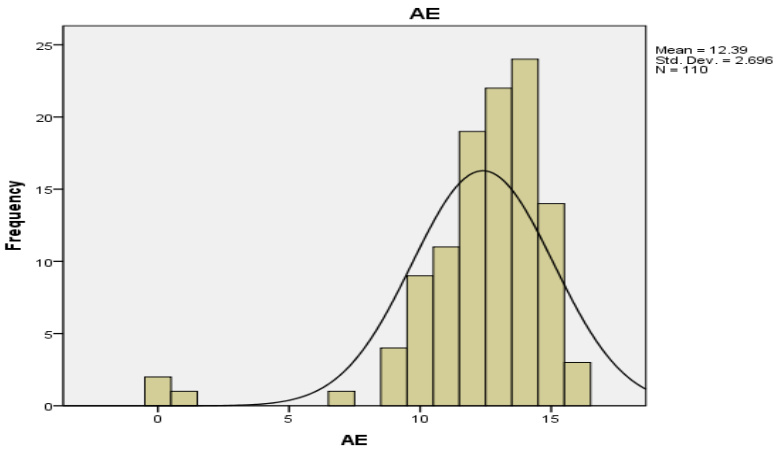

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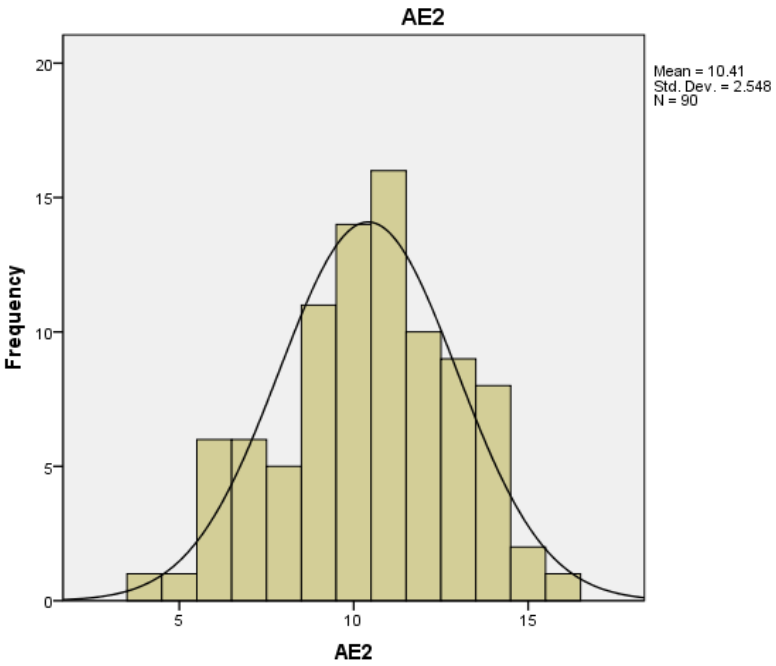
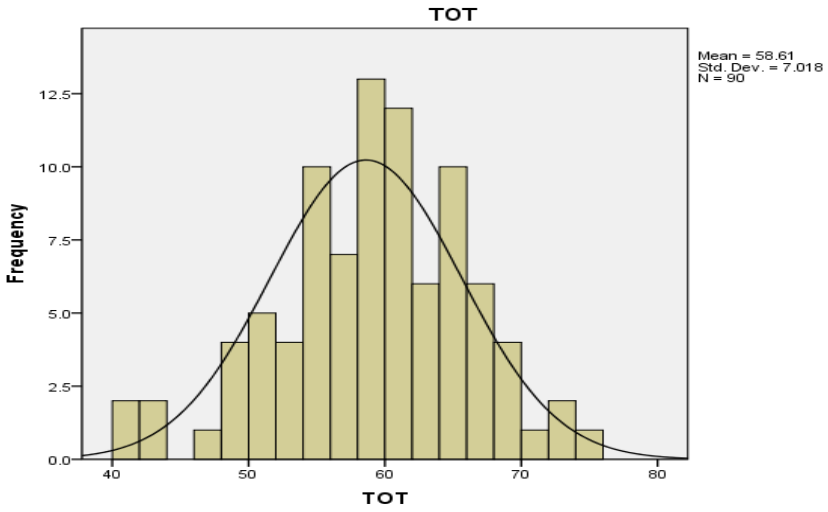


3rd Histogram represents Post-Test Takers (N=90)



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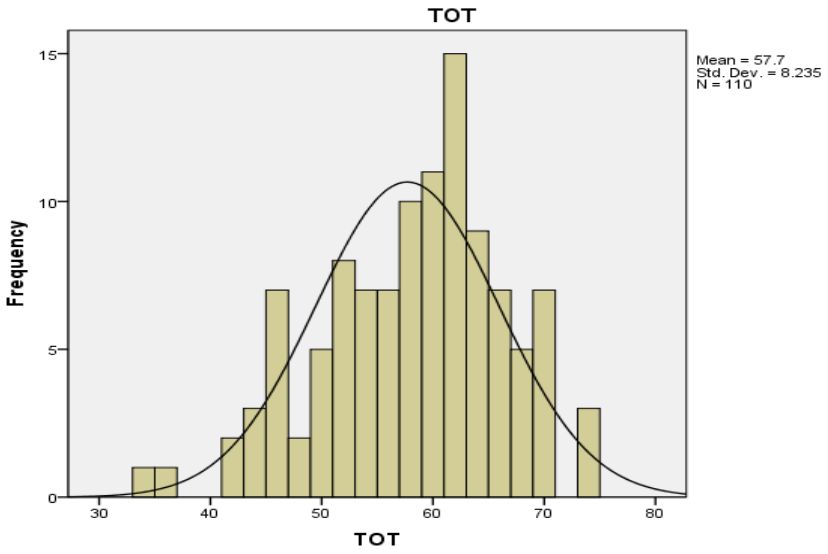

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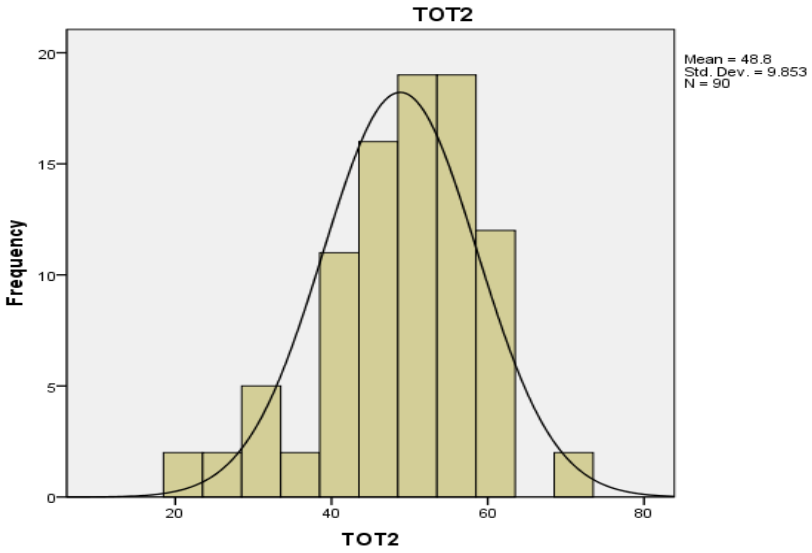

3rd Histogram represents Post-Test Takers (N=90)

Appendix 2

Findings for Research Question 2: **What is the relationship of the categories (Inference Making – IM, Assumption Recognition – AR, Deductive Reasoning – DR, Interpretation – IN, and Argument Evaluation - AE) of the Watson-Glaser Pre and Post Test data?**

Paired Samples Statistics for Watson-Glaser Participants of Both Pre/Post Tests

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	IM	9.87	90	2.423	.255
	IM2	7.34	90	2.748	.290
Pair 2	AR	12.32	90	3.097	.326
	AR2	10.86	90	3.157	.333
Pair 3	DR	11.56	90	2.249	.237
	DR2	9.63	90	2.628	.277
Pair 4	IN	12.62	90	1.858	.196
	IN2	10.56	90	3.145	.331
Pair 5	AE	12.26	90	3.161	.333
	AE2	10.41	90	2.548	.269
Pair 6	TOT	58.61	90	7.018	.740
	TOT2	48.80	90	9.853	1.039

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	IM & IM2	90	.054	.612
Pair 2	AR & AR2	90	.222	.035
Pair 3	DR & DR2	90	-.102	.339
Pair 4	IN & IN2	90	.031	.775
Pair 5	AE & AE2	90	.207	.050
Pair 6	TOT & TOT2	90	.090	.397

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Summary of Research Question 2: The relationship measure here is indicated by a paired sample correlations (N=90). This measure could only be given from those whom took both the Pre and Post Test. There were 2 significant relationships: The AR-AR2 and the AE-AE2 ($p \leq .05$). Please note that the other correlational coefficients were too small to indicate any significant level of relationship. Also note there is a negative yet insignificant relationship with DR-DR2.

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Appendix 3

Findings for Research Question 3: **What categories indicated statistically significant differences from Pre to Post Test?**

Paired Samples Test

		Paired Differences				
					95% Confidence Interval of the Difference	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1	IM - IM2	2.522	3.564	.376	1.776	3.269
Pair 2	AR - AR2	1.467	3.901	.411	.650	2.284
Pair 3	DR - DR2	1.922	3.630	.383	1.162	2.682
Pair 4	IN - IN2	2.067	3.603	.380	1.312	2.821
Pair 5	AE - AE2	1.844	3.625	.382	1.085	2.604
Pair 6	TOT - TOT2	9.811	11.569	1.219	7.388	12.234

		T	df	Sig. (2-tailed)
Pair 1	IM - IM2	6.714	89	.000
Pair 2	AR - AR2	3.567	89	.001
Pair 3	DR - DR2	5.024	89	.000
Pair 4	IN - IN2	5.441	89	.000
Pair 5	AE - AE2	4.826	89	.000
Pair 6	TOT - TOT2	8.045	89	.000

★★★★★★★★★★

Summary of Research Question 3: The statistically significant measure here is indicated by a paired sample tests (N=90). This measure could only be given from those whom took both the Pre and Post Test. There were statistically significant differences given for ALL of the measured Pre and Post Tests categories. It is necessary to note that these differences are non directional but an investigation of the means would indicate that the significant difference was negative. After further investigation by the evaluator it was determined that the Pre and Post Tests were not administered with the same standards. This difference can also show up on the data when a very valid and highly reliable instrument is used (such as the Watson-Glaser). It is a final recommendation that future administrations of the tests follow similar protocols in order to provide more useful data.

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