

Statistical Analysis in the second study for signed-up students

Table 1: Two-way ANOVA and Scheirer-Ray-Hare in the second study for signed-up students

	Sum Sq	Df	F value	Pr(>F)	Sig	Df	Sum Sq	H	p.value	Sig
Attention.(Intercept)	833.895	1	519.022	0.000						
Attention.Type	2.156	1	1.342	0.252		1	628.049	2.209	0.137	
Attention.CLRole	0.066	1	0.041	0.840		1	12.385	0.044	0.835	
Attention.Type:CLRole	1.648	1	1.026	0.316		1	311.029	1.094	0.296	
Attention.Residuals	86.760	54				54	15253.537			
Relevance.(Intercept)	1205.347	1	807.220	0.000						
Relevance.Type	0.419	1	0.281	0.598		1	122.415	0.432	0.511	
Relevance.CLRole	1.148	1	0.769	0.384		1	184.844	0.652	0.419	
Relevance.Type:CLRole	0.185	1	0.124	0.726		1	18.694	0.066	0.797	
Relevance.Residuals	80.633	54				54	15832.047			
Satisfaction.(Intercept)	901.289	1	541.353	0.000						
Satisfaction.Type	0.001	1	0.001	0.979		1	39.253	0.139	0.710	
Satisfaction.CLRole	0.420	1	0.252	0.618		1	16.986	0.060	0.806	
Satisfaction.Type:CLRole	1.299	1	0.780	0.381		1	190.331	0.672	0.412	
Satisfaction.Residuals	86.574	52				54	15885.931			
Level of Motivation.(Intercept)	971.682	1	706.131	0.000						
Level of Motivation.Type	0.802	1	0.582	0.449		1	247.424	0.869	0.351	
Level of Motivation.CLRole	0.138	1	0.101	0.752		1	82.286	0.289	0.591	
Level of Motivation.Type:CLRole	1.008	1	0.732	0.396		1	188.551	0.662	0.416	
Level of Motivation.Residuals	74.308	54				54	15712.740			

Signif. codes: 0 *** 0.01 ** 0.05

Table 2: Summary of Pair wilcoxon in the second study for signed-up students

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Attention.Type:CLRole.less.1	non-gamified.Apprentice	23	3.50	17.35	399	123	-1.75	0.041	0.279	small
Attention.Type:CLRole.less.2	ont-gamified.Apprentice	16	4.42	23.81	381	123	-1.75	0.041	0.279	small

1 Assumptions for Parametric Tests

Table 3: Univariate normality test in the second study for signed-up students

	normality.fail	W	p.value
Attention	FALSE	0.980	0.464
Relevance	FALSE	0.966	0.102
Satisfaction	FALSE	0.961	0.068
Level of Motivation	FALSE	0.980	0.436

Table 4: Notes to be taken into account about sample size in the second study for signed-up students

	code	description
Attention.Type.1	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Attention.Type.2	WARN: sample.size	current size is 8 and recommended size is 15 for the group: 'ont-gamified:Master'.
Relevance.Type.1	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Relevance.Type.2	WARN: sample.size	current size is 8 and recommended size is 15 for the group: 'ont-gamified:Master'.
Satisfaction.Type.1	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Satisfaction.Type.2	WARN: sample.size	current size is 8 and recommended size is 15 for the group: 'ont-gamified:Master'.
Level of Motivation.Type.1	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Level of Motivation.Type.2	WARN: sample.size	current size is 8 and recommended size is 15 for the group: 'ont-gamified:Master'.

Recent studies carried out through simulations have indicated that ANOVA is reliable even when the data are non-normally distributed and the sample size is greater than 15 observations for each group. This size value is based on the Reference: Rana, R. K., Singhal, R., & Dua, P. (2016). Deciphering the dilemma of parametric and nonparametric tests. Journal of the Practice of Cardiovascular Sciences, 2(2), 95.

The sample size to carried out any parametric and non-parametric analysis is 5, and it was established using common sense. The warning and fails indicated in this section should be taking into account when a paper or report will be elaborated.