Statistical Analysis in the second study for students with effective participation

Table 1: Two-way ANOVA and Scheirer-Ray-Hare in the second study for students with effective participation

	Sum Sq	Df	F value	Pr(>F)	Sig	Df	Sum Sq	H	p.value	Sig
Attention.(Intercept)	797.236	1	512.642	0.000						
Attention.Type	2.112	1	1.358	0.250		1	425.506	1.933	0.164	
Attention.CLRole	0.013	1	0.008	0.928		1	4.153	0.019	0.891	
Attention.Type:CLRole	1.626	1	1.045	0.312		1	255.507	1.161	0.281	
Attention.Residuals	73.092	47				47	10321.834			
Relevance.(Intercept)	1157.488	1	793.890	0.000						
Relevance.Type	0.417	1	0.286	0.595		1	104.914	0.477	0.490	
Relevance.CLRole	0.276	1	0.189	0.666		1	22.802	0.104	0.747	
Relevance.Type:CLRole	0.190	1	0.130	0.720		1	28.383	0.129	0.719	
Relevance.Residuals	68.526	47				47	10831.401			
Satisfaction.(Intercept)	903.152	1	631.374	0.000						
Satisfaction.Type	0.027	1	0.019	0.891		1	23.395	0.107	0.744	
Satisfaction.CLRole	0.147	1	0.103	0.750		1	36.149	0.165	0.685	
Satisfaction.Type:CLRole	0.941	1	0.658	0.421		1	205.662	0.939	0.332	
Satisfaction.Residuals	65.801	46				47	10682.794			
Level of Motivation.(Intercept)	940.880	1	735.491	0.000						
Level of Motivation.Type	0.925	1	0.723	0.399		1	206.449	0.935	0.333	
Level of Motivation.CLRole	0.051	1	0.040	0.843		1	0.265	0.001	0.972	
Level of Motivation.Type:CLRole	1.138	1	0.889	0.350		1	206.977	0.938	0.333	
Level of Motivation.Residuals	60.125	47				47	10620.809			

Signif. codes: 0 “**” 0.01 “*” 0.05

Table 2: Summary of Pair wilcoxon in the second study for students with effective participation

1 Assumptions for Parametric Tests

Table 3: Univariate normality test in the second study for students with effective participation

	normality.fail	W	p.value
Attention	FALSE	0.979	0.501
Relevance	FALSE	0.972	0.255
Satisfaction	FALSE	0.957	0.067
Level of Motivation	FALSE	0.982	0.629

Table 4: Notes to be taken into account about sample size in the second study for students with effective participation

	code	description
Attention.Type.1	WARN: sample.size	current size is 13 and recommended size is 15 for the group: 'ont-gamified:Apprentice'.
Attention.Type.2	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Attention.Type.3	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 13 and recommended size is 15 for the group: 'ont-gamified:Apprentice'.
Relevance.Type.2	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Relevance.Type.3	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 13 and recommended size is 15 for the group: 'ont-gamified:Apprentice'.
Satisfaction.Type.2	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Satisfaction.Type.3	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 13 and recommended size is 15 for the group: 'ont-gamified:Apprentice'.
Level of Motivation.Type.2	WARN: sample.size	current size is 11 and recommended size is 15 for the group: 'non-gamified:Master'.
Level of Motivation.Type.3	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 thatn 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.