

Statistical Analysis in the third study for students with effective participation

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

	Sum Sq	Df	F value	Pr(>F)	Sig	Df	Sum Sq	H	p.value	Sig
Interest/Enjoyment.(Intercept)	3.369	1	3.153	0.084						
Interest/Enjoyment.Type	0.123	1	0.115	0.736		1	6.035	0.039	0.844	
Interest/Enjoyment.CLRole	1.028	1	0.962	0.333		1	288.400	1.844	0.175	
Interest/Enjoyment.Type:CLRole	3.593	1	3.363	0.074		1	363.625	2.325	0.127	
Interest/Enjoyment.Residuals	41.669	39				39	5911.439			
Perceived Choice.(Intercept)	2.864	1	2.531	0.120						
Perceived Choice.Type	2.969	1	2.623	0.113		1	208.305	1.326	0.249	
Perceived Choice.CLRole	0.156	1	0.138	0.713		1	34.106	0.217	0.641	
Perceived Choice.Type:CLRole	1.983	1	1.752	0.193		1	281.433	1.792	0.181	
Perceived Choice.Residuals	44.141	39				39	6071.656			
Pressure/Tension.(Intercept)	2.277	1	4.613	0.038						
Pressure/Tension.Type	0.602	1	1.219	0.276		1	226.410	1.450	0.228	
Pressure/Tension.CLRole	6.261	1	12.684	0.001	**	1	1088.221	6.970	0.008	**
Pressure/Tension.Type:CLRole	0.086	1	0.175	0.678		1	64.669	0.414	0.520	
Pressure/Tension.Residuals	19.252	39				39	5177.700			
Effort/Importance.(Intercept)	0.022	1	0.027	0.870						
Effort/Importance.Type	4.437	1	5.339	0.026	*	1	673.313	4.327	0.038	*
Effort/Importance.CLRole	1.787	1	2.150	0.151		1	198.997	1.279	0.258	
Effort/Importance.Type:CLRole	0.025	1	0.030	0.864		1	7.613	0.049	0.825	
Effort/Importance.Residuals	32.411	39				39	5655.578			
Intrinsic Motivation.(Intercept)	2.145	1	7.510	0.009						
Intrinsic Motivation.Type	0.469	1	1.644	0.207		1	49.884	0.316	0.574	
Intrinsic Motivation.CLRole	0.438	1	1.534	0.223		1	284.759	1.806	0.179	
Intrinsic Motivation.Type:CLRole	0.808	1	2.831	0.100		1	353.033	2.239	0.135	
Intrinsic Motivation.Residuals	11.137	39				39	5934.325			
Attention.(Intercept)	0.257	1	0.183	0.671						
Attention.Type	0.246	1	0.175	0.678		1	94.855	0.577	0.448	
Attention.CLRole	0.115	1	0.082	0.776		1	12.076	0.073	0.786	
Attention.Type:CLRole	0.452	1	0.321	0.574		1	51.842	0.315	0.574	
Attention.Residuals	54.859	39				40	6911.728			
Relevance.(Intercept)	0.373	1	0.909	0.346						
Relevance.Type	0.940	1	2.294	0.138		1	38.928	0.238	0.626	
Relevance.CLRole	0.226	1	0.551	0.462		1	101.179	0.619	0.431	
Relevance.Type:CLRole	1.928	1	4.705	0.036	*	1	607.952	3.720	0.054	
Relevance.Residuals	15.981	39				40	6279.441			
Satisfaction.(Intercept)	2.568	1	1.077	0.306						
Satisfaction.Type	0.081	1	0.034	0.855		1	3.914	0.024	0.877	
Satisfaction.CLRole	2.104	1	0.883	0.353		1	105.183	0.642	0.423	
Satisfaction.Type:CLRole	0.137	1	0.057	0.812		1	19.588	0.120	0.730	
Satisfaction.Residuals	92.944	39				40	6918.816			

Table 1: *(continued)*

	Sum Sq	Df	F value	Pr(>F)	Sig	Df	Sum Sq	H	p.value	Sig
Level of Motivation.(Intercept)	0.393	1	1.132	0.294						
Level of Motivation.Type	0.001	1	0.004	0.951		1	9.263	0.056	0.813	
Level of Motivation.CLRole	0.002	1	0.007	0.934		1	6.394	0.039	0.844	
Level of Motivation.Type:CLRole	0.130	1	0.376	0.543		1	120.045	0.729	0.393	
Level of Motivation.Residuals	13.527	39				40	6946.798			

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

Table 2: Summary of Tukey post-hoc in the third study for students with effective participation

	N	mean	lsmean	SE	df	lwr.CI	upr.CI	t.ratio	p.value	p.ajd	g	sig	mag
Effort/Importance:ont-gamified - w/o-gamified	43	0.642	0.684	0.296		0.076	1.208	2.311	0.026	0.027	0.69	*	medium

Table 3: Summary of Pair wilcoxon in the third study for students with effective participation

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Interest/Enjoyment.Type:CLRole.less.1	ont-gamified.Apprentice	15	0.31	10.53	158.0	38.0	-1.78	0.039	0.362	medium
Interest/Enjoyment.Type:CLRole.less.2	ont-gamified.Master	9	0.51	15.78	142.0	38.0	-1.78	0.039	0.362	medium
Pressure/Tension.Type:CLRole.greater.1	ont-gamified.Apprentice	15	0.35	15.10	226.5	106.5	2.33	0.009	0.476	medium
Pressure/Tension.Type:CLRole.greater.2	ont-gamified.Master	9	-0.46	8.17	73.5	106.5	2.33	0.009	0.476	medium
Pressure/Tension.Type:CLRole.two.sided.1	ont-gamified.Apprentice	15	0.35	15.10	226.5	106.5	2.33	0.018	0.476	medium
Pressure/Tension.Type:CLRole.two.sided.2	ont-gamified.Master	9	-0.46	8.17	73.5	106.5	2.33	0.018	0.476	medium
Pressure/Tension.Type:CLRole.greater.11	ont-gamified.Apprentice	15	0.35	12.90	193.5	73.5	2.23	0.012	0.487	medium
Pressure/Tension.Type:CLRole.greater.21	w/o-gamified.Master	6	-1.60	6.25	37.5	73.5	2.23	0.012	0.487	medium
Pressure/Tension.Type:CLRole.two.sided.11	ont-gamified.Apprentice	15	0.35	12.90	193.5	73.5	2.23	0.024	0.487	medium
Pressure/Tension.Type:CLRole.two.sided.21	w/o-gamified.Master	6	-1.60	6.25	37.5	73.5	2.23	0.024	0.487	medium
Effort/Importance.Type.greater.1	ont-gamified	24	0.40	25.52	612.5	312.5	2.08	0.019	0.317	medium
Effort/Importance.Type.greater.2	w/o-gamified	19	-0.48	17.55	333.5	312.5	2.08	0.019	0.317	medium
Effort/Importance.Type.two.sided.1	ont-gamified	24	0.40	25.52	612.5	312.5	2.08	0.037	0.317	medium
Effort/Importance.Type.two.sided.2	w/o-gamified	19	-0.48	17.55	333.5	312.5	2.08	0.037	0.317	medium
Effort/Importance.Type:CLRole.greater.1	ont-gamified.Apprentice	15	0.52	12.80	192.0	72.0	2.12	0.017	0.462	medium
Effort/Importance.Type:CLRole.greater.2	w/o-gamified.Master	6	-0.62	6.50	39.0	72.0	2.12	0.017	0.462	medium
Effort/Importance.Type:CLRole.two.sided.1	ont-gamified.Apprentice	15	0.52	12.80	192.0	72.0	2.12	0.033	0.462	medium
Effort/Importance.Type:CLRole.two.sided.2	w/o-gamified.Master	6	-0.62	6.50	39.0	72.0	2.12	0.033	0.462	medium
Intrinsic Motivation.Type:CLRole.less.1	ont-gamified.Apprentice	15	0.03	10.40	156.0	36.0	-1.88	0.032	0.383	medium
Intrinsic Motivation.Type:CLRole.less.2	ont-gamified.Master	9	0.46	16.00	144.0	36.0	-1.88	0.032	0.383	medium
Intrinsic Motivation.Type:CLRole.greater.1	ont-gamified.Master	9	0.46	9.67	87.0	42.0	1.77	0.044	0.456	medium
Intrinsic Motivation.Type:CLRole.greater.2	w/o-gamified.Master	6	0.07	5.50	33.0	42.0	1.77	0.044	0.456	medium
Relevance.Type:CLRole.less.1	ont-gamified.Apprentice	16	-0.08	11.03	176.5	40.5	-1.79	0.038	0.358	medium
Relevance.Type:CLRole.less.2	ont-gamified.Master	9	0.87	16.50	148.5	40.5	-1.79	0.038	0.358	medium
Relevance.Type:CLRole.greater.1	ont-gamified.Master	9	0.87	9.61	86.5	41.5	1.72	0.045	0.445	medium
Relevance.Type:CLRole.greater.2	w/o-gamified.Master	6	-0.16	5.58	33.5	41.5	1.72	0.045	0.445	medium