

Statistical Analysis in the third study for signed up students

October 1, 2018

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

	Sum Sq	Df	F value	Pr(>F)	Sig	Df	Sum Sq	H	p.value	Sig
Interest/Enjoyment.(Intercept)	0.836	1	0.610	0.439						
Interest/Enjoyment.Type	2.149	1	1.568	0.217		1	116.659	0.531	0.466	
Interest/Enjoyment.CLRole	2.230	1	1.627	0.208		1	398.500	1.813	0.178	
Interest/Enjoyment.Type:CLRole	2.804	1	2.046	0.159		1	413.063	1.879	0.170	
Interest/Enjoyment.Residuals	64.426	47				47	10060.778			
Perceived Choice.(Intercept)	0.160	1	0.120	0.731						
Perceived Choice.Type	11.013	1	8.236	0.006	**	1	1229.745	5.587	0.018	*
Perceived Choice.CLRole	0.465	1	0.348	0.558		1	58.513	0.266	0.606	
Perceived Choice.Type:CLRole	1.641	1	1.227	0.274		1	274.660	1.248	0.264	
Perceived Choice.Residuals	62.848	47				47	9442.582			
Pressure/Tension.(Intercept)	0.869	1	1.690	0.200						
Pressure/Tension.Type	0.018	1	0.035	0.853		1	0.492	0.002	0.962	
Pressure/Tension.CLRole	8.430	1	16.389	0.000	**	1	1711.859	7.804	0.005	**
Pressure/Tension.Type:CLRole	0.020	1	0.039	0.845		1	40.610	0.185	0.667	
Pressure/Tension.Residuals	24.175	47				47	9215.539			
Effort/Importance.(Intercept)	0.331	1	0.328	0.570						
Effort/Importance.Type	7.319	1	7.258	0.010	**	1	1289.481	5.893	0.015	*
Effort/Importance.CLRole	1.290	1	1.279	0.264		1	149.901	0.685	0.408	
Effort/Importance.Type:CLRole	0.022	1	0.022	0.883		1	2.171	0.010	0.921	
Effort/Importance.Residuals	47.391	47				47	9498.447			
Intrinsic Motivation.(Intercept)	0.561	1	1.508	0.226						
Intrinsic Motivation.Type	2.533	1	6.812	0.012	*	1	918.000	4.154	0.042	*
Intrinsic Motivation.CLRole	1.031	1	2.772	0.103		1	404.833	1.832	0.176	
Intrinsic Motivation.Type:CLRole	0.468	1	1.258	0.268		1	273.961	1.240	0.266	
Intrinsic Motivation.Residuals	17.481	47				47	9453.205			
Attention.(Intercept)	0.032	1	0.022	0.882						
Attention.Type	0.028	1	0.020	0.889		1	33.973	0.148	0.700	
Attention.CLRole	0.365	1	0.254	0.617		1	22.023	0.096	0.756	
Attention.Type:CLRole	0.246	1	0.171	0.681		1	46.860	0.205	0.651	
Attention.Residuals	67.644	47				48	11577.143			
Relevance.(Intercept)	0.222	1	0.505	0.481						
Relevance.Type	1.559	1	3.541	0.066		1	310.633	1.365	0.243	
Relevance.CLRole	1.299	1	2.950	0.092		1	467.303	2.053	0.152	
Relevance.Type:CLRole	0.791	1	1.797	0.187		1	280.216	1.231	0.267	
Relevance.Residuals	20.698	47				48	10548.849			
Satisfaction.(Intercept)	0.002	1	0.001	0.976						
Satisfaction.Type	4.424	1	1.661	0.204		1	268.166	1.173	0.279	
Satisfaction.CLRole	1.741	1	0.654	0.423		1	88.555	0.387	0.534	
Satisfaction.Type:CLRole	0.438	1	0.165	0.687		1	26.457	0.116	0.734	
Satisfaction.Residuals	125.193	47				48	11271.822			

Table 1: *(continued)*

	Sum Sq	Df	F value	Pr(>F)	Sig	Df	Sum Sq	H	p.value	Sig
Level of Motivation.(Intercept)	0.093	1	0.272	0.604						
Level of Motivation.Type	0.175	1	0.513	0.477		1	69.333	0.302	0.582	
Level of Motivation.CLRole	0.056	1	0.164	0.688		1	55.265	0.241	0.623	
Level of Motivation.Type:CLRole	0.045	1	0.131	0.719		1	79.156	0.345	0.557	
Level of Motivation.Residuals	15.976	47				48	11490.246			

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

Table 2: Summary of Tukey post-hoc in the third study for signed up students

	N	mean	lsmean	SE	df	lwr.CI	upr.CI	t.ratio	p.value	p.adj	g	sig	mag
Perceived Choice:ont-gamified - w/o-gamified	51	0.880	0.989	0.345		0.227	1.532	2.870	0.006	0.009	0.752	**	medium
Effort/Importance:ont-gamified - w/o-gamified	51	0.794	0.806	0.299		0.228	1.361	2.694	0.010	0.007	0.785	**	medium
Intrinsic Motivation:ont-gamified - w/o-gamified	51	0.431	0.474	0.182		0.087	0.775	2.610	0.012	0.015	0.682	*	medium

Table 3: Summary of Pair wilcoxon in the third study for signed up students

	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
Interest/Enjoyment.Type:CLRole.greater.1	ont-gamified.Master	9	0.51	18.44	166.0	121.0	1.75	0.041	0.331	medium
Interest/Enjoyment.Type:CLRole.greater.2	w/o-gamified.Apprentice	19	0.11	12.63	240.0	121.0	1.75	0.041	0.331	medium
Perceived Choice.Type.greater.1	ont-gamified	24	0.53	31.21	749.0	449.0	2.36	0.009	0.331	medium
Perceived Choice.Type.greater.2	w/o-gamified	27	-0.23	21.37	577.0	449.0	2.36	0.009	0.331	medium
Perceived Choice.Type.two.sided.1	ont-gamified	24	0.53	31.21	749.0	449.0	2.36	0.017	0.331	medium
Perceived Choice.Type.two.sided.2	w/o-gamified	27	-0.23	21.37	577.0	449.0	2.36	0.017	0.331	medium
Perceived Choice.Type:CLRole.greater.1	ont-gamified.Master	9	0.95	19.56	176.0	131.0	2.25	0.012	0.424	medium
Perceived Choice.Type:CLRole.greater.2	w/o-gamified.Apprentice	19	-0.07	12.11	230.0	131.0	2.25	0.012	0.424	medium
Perceived Choice.Type:CLRole.two.sided.1	ont-gamified.Master	9	0.95	19.56	176.0	131.0	2.25	0.023	0.424	medium
Perceived Choice.Type:CLRole.two.sided.2	w/o-gamified.Apprentice	19	-0.07	12.11	230.0	131.0	2.25	0.023	0.424	medium
Perceived Choice.Type:CLRole.greater.11	ont-gamified.Master	9	0.95	11.50	103.5	58.5	2.17	0.015	0.526	large
Perceived Choice.Type:CLRole.greater.21	w/o-gamified.Master	8	-0.74	6.19	49.5	58.5	2.17	0.015	0.526	large
Perceived Choice.Type:CLRole.two.sided.11	ont-gamified.Master	9	0.95	11.50	103.5	58.5	2.17	0.029	0.526	large
Perceived Choice.Type:CLRole.two.sided.21	w/o-gamified.Master	8	-0.74	6.19	49.5	58.5	2.17	0.029	0.526	large
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	13.87	208.0	88.0	1.81	0.036	0.378	medium
Pressure/Tension.Type:CLRole.greater.21	w/o-gamified.Master	8	-0.85	8.50	68.0	88.0	1.81	0.036	0.378	medium
Pressure/Tension.Type:CLRole.less.1	ont-gamified.Master	9	-0.46	9.83	88.5	43.5	-2.08	0.019	0.392	medium
Pressure/Tension.Type:CLRole.less.2	w/o-gamified.Apprentice	19	0.22	16.71	317.5	43.5	-2.08	0.019	0.392	medium
Pressure/Tension.Type:CLRole.two.sided.11	ont-gamified.Master	9	-0.46	9.83	88.5	43.5	-2.08	0.037	0.392	medium
Pressure/Tension.Type:CLRole.two.sided.21	w/o-gamified.Apprentice	19	0.22	16.71	317.5	43.5	-2.08	0.037	0.392	medium
Effort/Importance.Type.greater.1	ont-gamified	24	0.40	31.33	752.0	452.0	2.43	0.007	0.340	medium
Effort/Importance.Type.greater.2	w/o-gamified	27	-0.48	21.26	574.0	452.0	2.43	0.007	0.340	medium
Effort/Importance.Type.two.sided.1	ont-gamified	24	0.40	31.33	752.0	452.0	2.43	0.014	0.340	medium
Effort/Importance.Type.two.sided.2	w/o-gamified	27	-0.48	21.26	574.0	452.0	2.43	0.014	0.340	medium
Effort/Importance.Type:CLRole.greater.1	ont-gamified.Apprentice	15	0.52	21.47	322.0	202.0	2.08	0.019	0.356	medium
Effort/Importance.Type:CLRole.greater.2	w/o-gamified.Apprentice	19	-0.48	14.37	273.0	202.0	2.08	0.019	0.356	medium
Effort/Importance.Type:CLRole.two.sided.1	ont-gamified.Apprentice	15	0.52	21.47	322.0	202.0	2.08	0.037	0.356	medium
Effort/Importance.Type:CLRole.two.sided.2	w/o-gamified.Apprentice	19	-0.48	14.37	273.0	202.0	2.08	0.037	0.356	medium
Effort/Importance.Type:CLRole.greater.11	ont-gamified.Apprentice	15	0.52	14.07	211.0	91.0	2.01	0.022	0.420	medium
Effort/Importance.Type:CLRole.greater.21	w/o-gamified.Master	8	-0.62	8.12	65.0	91.0	2.01	0.022	0.420	medium
Effort/Importance.Type:CLRole.two.sided.11	ont-gamified.Apprentice	15	0.52	14.07	211.0	91.0	2.01	0.044	0.420	medium
Effort/Importance.Type:CLRole.two.sided.21	w/o-gamified.Master	8	-0.62	8.12	65.0	91.0	2.01	0.044	0.420	medium

Table 3: *(continued)*

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Intrinsic Motivation.Type.greater.1	ont-gamified	24	0.28	30.50	732.0	432.0	2.04	0.021	0.285	small
Intrinsic Motivation.Type.greater.2	w/o-gamified	27	-0.08	22.00	594.0	432.0	2.04	0.021	0.285	small

Table 3: (continued)

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Intrinsic Motivation.Type.two.sided.1	ont-gamified	24	0.28	30.50	732.0	432.0	2.04	0.042	0.285	small
Intrinsic Motivation.Type.two.sided.2	w/o-gamified	27	-0.08	22.00	594.0	432.0	2.04	0.042	0.285	small
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	19.78	178.0	133.0	2.34	0.009	0.442	medium
Intrinsic Motivation.Type.CLRole.greater.2	w/o-gamified.Apprentice	19	-0.25	12.00	228.0	133.0	2.34	0.009	0.442	medium
Intrinsic Motivation.Type.CLRole.two.sided.1	ont-gamified.Master	9	0.46	19.78	178.0	133.0	2.34	0.019	0.442	medium
Intrinsic Motivation.Type.CLRole.two.sided.2	w/o-gamified.Apprentice	19	-0.25	12.00	228.0	133.0	2.34	0.019	0.442	medium
Intrinsic Motivation.Type.CLRole.greater.11	ont-gamified.Master	9	0.46	11.56	104.0	59.0	2.21	0.014	0.537	large
Intrinsic Motivation.Type.CLRole.greater.21	w/o-gamified.Master	8	0.01	6.12	49.0	59.0	2.21	0.014	0.537	large
Intrinsic Motivation.Type.CLRole.two.sided.11	ont-gamified.Master	9	0.46	11.56	104.0	59.0	2.21	0.027	0.537	large
Intrinsic Motivation.Type.CLRole.two.sided.21	w/o-gamified.Master	8	0.01	6.12	49.0	59.0	2.21	0.027	0.537	large
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	18.83	169.5	124.5	1.93	0.027	0.364	medium
Relevance.Type.CLRole.greater.2	w/o-gamified.Apprentice	19	-0.08	12.45	236.5	124.5	1.93	0.027	0.364	medium
Relevance.Type.CLRole.greater.11	ont-gamified.Master	9	0.87	10.94	98.5	53.5	1.69	0.048	0.411	medium
Relevance.Type.CLRole.greater.21	w/o-gamified.Master	8	-0.08	6.81	54.5	53.5	1.69	0.048	0.411	medium