

Summary of nonparametric statistics analysis for Differences of Scores in the third study for students with effective participation

Table 1: Summary of Scheirer-Ray-Hare results for Differences of Scores in the third study for students with effective participation

	Df	Sum Sq	H	p.value	Sig
difScore					
difScore:Type	1	1606.020	7.867	0.005	**
difScore:CLRole	1	1428.177	6.996	0.008	**
difScore:Type:CLRole	1	37.170	0.182	0.670	
difScore:Residuals	45	6728.133			

Signif. codes: 0 ‘***’ 0.01 ‘**’ 0.05

Table 2: Descriptive statistic of the pair wilcoxon analysis for Differences of Scores in the third study for students with effective participation

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type.greater.1	ont-gamified	23	2.24	31.09	715.0	439.0	2.80	0.002	0.401	medium
Type.greater.2	w/o-gamified	26	-0.37	19.62	510.0	439.0	2.80	0.002	0.401	medium
Type.two.sided.1	ont-gamified	23	2.24	31.09	715.0	439.0	2.80	0.004	0.401	medium
Type.two.sided.2	w/o-gamified	26	-0.37	19.62	510.0	439.0	2.80	0.004	0.401	medium
Type:CLRole.greater.1	ont-gamified.Apprentice	16	2.58	22.69	363.0	227.0	2.48	0.006	0.420	medium
Type:CLRole.greater.2	w/o-gamified.Apprentice	19	0.66	14.05	267.0	227.0	2.48	0.006	0.420	medium
Type:CLRole.greater.1	ont-gamified.Apprentice	16	2.58	22.69	363.0	227.0	2.48	0.012	0.420	medium
Type:CLRole.two.sided.2	w/o-gamified.Apprentice	19	0.66	14.05	267.0	227.0	2.48	0.012	0.420	medium
Type:CLRole.greater.11	ont-gamified.Apprentice	16	2.58	15.00	240.0	104.0	3.21	0.000	0.669	large
Type:CLRole.greater.21	w/o-gamified.Master	7	-3.16	5.14	36.0	104.0	3.21	0.000	0.669	large
Type:CLRole.two.sided.11	ont-gamified.Apprentice	16	2.58	15.00	240.0	104.0	3.21	0.001	0.669	large
Type:CLRole.two.sided.21	w/o-gamified.Master	7	-3.16	5.14	36.0	104.0	3.21	0.001	0.669	large
Type:CLRole.greater.12	ont-gamified.Master	7	1.06	9.86	69.0	41.0	2.11	0.019	0.563	large
Type:CLRole.greater.22	w/o-gamified.Master	7	-3.16	5.14	36.0	41.0	2.11	0.019	0.563	large
Type:CLRole.two.sided.12	ont-gamified.Master	7	1.06	9.86	69.0	41.0	2.11	0.038	0.563	large
Type:CLRole.two.sided.22	w/o-gamified.Master	7	-3.16	5.14	36.0	41.0	2.11	0.038	0.563	large
Type:CLRole.greater.13	w/o-gamified.Apprentice	19	0.66	15.82	300.5	110.5	2.54	0.004	0.499	medium
Type:CLRole.greater.23	w/o-gamified.Master	7	-3.16	7.21	50.5	110.5	2.54	0.004	0.499	medium
Type:CLRole.two.sided.13	w/o-gamified.Apprentice	19	0.66	15.82	300.5	110.5	2.54	0.009	0.499	medium
Type:CLRole.two.sided.23	w/o-gamified.Master	7	-3.16	7.21	50.5	110.5	2.54	0.009	0.499	medium

Table 3: Full descriptive statistic of the pair wilcoxon analysis for Differences of Scores in the third study for students with effective participation

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type.less.1	ont-gamified	23	2.24	31.09	715.0	439.0	2.80	0.998	0.401	medium
Type.less.2	w/o-gamified	26	-0.37	19.62	510.0	439.0	2.80	0.998	0.401	medium
Type.greater.1	ont-gamified	23	2.24	31.09	715.0	439.0	2.80	0.002	0.401	medium
Type.greater.2	w/o-gamified	26	-0.37	19.62	510.0	439.0	2.80	0.002	0.401	medium
Type.two.sided.1	ont-gamified	23	2.24	31.09	715.0	439.0	2.80	0.004	0.401	medium
Type.two.sided.2	w/o-gamified	26	-0.37	19.62	510.0	439.0	2.80	0.004	0.401	medium
Type:CLRole.less.1	ont-gamified.Apprentice	16	2.58	13.44	215.0	79.0	1.54	0.941	0.320	medium
Type:CLRole.less.2	ont-gamified.Master	7	1.06	8.71	61.0	79.0	1.54	0.941	0.320	medium
Type:CLRole.greater.1	ont-gamified.Apprentice	16	2.58	13.44	215.0	79.0	1.54	0.068	0.320	medium
Type:CLRole.greater.2	ont-gamified.Apprentice	7	1.06	8.71	61.0	79.0	1.54	0.068	0.320	medium
Type:CLRole.two.sided.1	ont-gamified.Apprentice	16	2.58	13.44	215.0	79.0	1.54	0.135	0.320	medium
Type:CLRole.two.sided.2	ont-gamified.Master	7	1.06	8.71	61.0	79.0	1.54	0.135	0.320	medium
Type:CLRole.less.11	ont-gamified.Apprentice	16	2.58	22.69	363.0	227.0	2.48	0.994	0.420	medium
Type:CLRole.less.21	w/o-gamified.Apprentice	19	0.66	14.05	267.0	227.0	2.48	0.994	0.420	medium
Type:CLRole.greater.11	ont-gamified.Apprentice	16	2.58	22.69	363.0	227.0	2.48	0.006	0.420	medium
Type:CLRole.greater.21	w/o-gamified.Apprentice	19	0.66	14.05	267.0	227.0	2.48	0.006	0.420	medium
Type:CLRole.two.sided.11	ont-gamified.Apprentice	16	2.58	22.69	363.0	227.0	2.48	0.012	0.420	medium
Type:CLRole.two.sided.21	w/o-gamified.Apprentice	19	0.66	14.05	267.0	227.0	2.48	0.012	0.420	medium
Type:CLRole.less.12	ont-gamified.Apprentice	16	2.58	15.00	240.0	104.0	3.21	1.000	0.669	large
Type:CLRole.less.22	w/o-gamified.Master	7	-3.16	5.14	36.0	104.0	3.21	1.000	0.669	large
Type:CLRole.greater.12	ont-gamified.Apprentice	16	2.58	15.00	240.0	104.0	3.21	0.000	0.669	large
Type:CLRole.greater.22	w/o-gamified.Master	7	-3.16	5.14	36.0	104.0	3.21	0.000	0.669	large
Type:CLRole.two.sided.12	ont-gamified.Apprentice	16	2.58	15.00	240.0	104.0	3.21	0.001	0.669	large
Type:CLRole.two.sided.22	w/o-gamified.Master	7	-3.16	5.14	36.0	104.0	3.21	0.001	0.669	large
Type:CLRole.less.13	ont-gamified.Master	7	1.06	13.57	95.0	67.0	0.03	0.522	0.006	none
Type:CLRole.less.23	w/o-gamified.Apprentice	19	0.66	13.47	256.0	67.0	0.03	0.522	0.006	none
Type:CLRole.greater.13	ont-gamified.Master	7	1.06	13.57	95.0	67.0	0.03	0.500	0.006	none
Type:CLRole.greater.23	w/o-gamified.Apprentice	19	0.66	13.47	256.0	67.0	0.03	0.500	0.006	none
Type:CLRole.two.sided.13	ont-gamified.Master	7	1.06	13.57	95.0	67.0	0.03	1.000	0.006	none
Type:CLRole.two.sided.23	w/o-gamified.Apprentice	19	0.66	13.47	256.0	67.0	0.03	1.000	0.006	none
Type:CLRole.less.14	ont-gamified.Master	7	1.06	9.86	69.0	41.0	2.11	0.987	0.563	large
Type:CLRole.less.24	w/o-gamified.Master	7	-3.16	5.14	36.0	41.0	2.11	0.987	0.563	large
Type:CLRole.greater.14	ont-gamified.Master	7	1.06	9.86	69.0	41.0	2.11	0.019	0.563	large

Table 3: *(continued)*

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type:CLRole.greater.24	w/o-gamified.Master	7	-3.16	5.14	36.0	41.0	2.11	0.019	0.563	large
Type:CLRole.two.sided.14	ont-gamified.Master	7	1.06	9.86	69.0	41.0	2.11	0.038	0.563	large
Type:CLRole.two.sided.24	w/o-gamified.Master	7	-3.16	5.14	36.0	41.0	2.11	0.038	0.563	large
Type:CLRole.less.15	w/o-gamified.Apprentice	19	0.66	15.82	300.5	110.5	2.54	0.996	0.499	medium
Type:CLRole.less.25	w/o-gamified.Master	7	-3.16	7.21	50.5	110.5	2.54	0.996	0.499	medium
Type:CLRole.greater.15	w/o-gamified.Apprentice	19	0.66	15.82	300.5	110.5	2.54	0.004	0.499	medium
Type:CLRole.greater.25	w/o-gamified.Master	7	-3.16	7.21	50.5	110.5	2.54	0.004	0.499	medium

Table 3: *(continued)*

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type:CLRole.two.sided.15	w/o-gamified.Apprentice	19	0.66	15.82	300.5	110.5	2.54	0.009	0.499	medium
Type:CLRole.two.sided.25	w/o-gamified.Master	7	-3.16	7.21	50.5	110.5	2.54	0.009	0.499	medium