Summary of nonparametric statistics analysis for Gain in Skill/Knowledge as the latent trait estimates in the pilot study for students with effective participation

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Table 1: Summary of Scheirer-Ray-Hare results for Gain in Skill/Knowledge as the latent trait estimates in the pilot study for students with effective participation

	Df	Sum Sq	H	p.value	Sig
gain.theta					
gain.theta:Type	1	1.817	0.047	0.828	
gain.theta:CLRole	1	207.161	5.388	0.020	*
gain.theta:Type:CLRole	1	2.621	0.068	0.794	
gain.theta:Residuals	17	557.400			

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

Table 2: Descriptive statistic of the pair wilcoxon analysis for Gain in Skill/Knowledge as the latent trait estimates in the pilot study for students with effective participation

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type:CLRole.greater.1	non-gamified.Apprentice	5	3.21	6	30	15	2.24	0.018	0.791	large
Type:CLRole.greater.2	non-gamified.Master	3	0.88	2	6	15	2.24	0.018	0.791	large
Type:CLRole.two.sided.1	non-gamified.Apprentice	5	3.21	6	30	15	2.24	0.036	0.791	large
Type:CLRole.two.sided.2	non-gamified.Master	3	0.88	2	6	15	2.24	0.036	0.791	large

Table 3: Full descriptive statistic of the pair wilcoxon analysis for Gain in Skill/Knowledge as the latent trait estimates in the pilot study for students with effective participation

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type.less.1	non-gamified	8	2.81	10.62	85	49	−0.22	0.423	0.047	none
Type.less.2	ont-gamified	13	4.68	11.23	146	49	−0.22	0.423	0.047	none
Type.greater.1	non-gamified	8	2.81	10.62	85	49	−0.22	0.591	0.047	none
Type.greater.2	ont-gamified	13	4.68	11.23	146	49	−0.22	0.591	0.047	none
Type.two.sided.1	non-gamified	8	2.81	10.62	85	49	−0.22	0.846	0.047	none
Type.two.sided.2	ont-gamified	13	4.68	11.23	146	49	−0.22	0.846	0.047	none
Type:CLRole.less.1	non-gamified.Apprentice	5	3.21	6.00	30	15	2.24	1.000	0.791	large
Type:CLRole.less.2	non-gamified.Master	3	0.88	2.00	6	15	2.24	1.000	0.791	large
Type:CLRole.greater.1	non-gamified.Apprentice	5	3.21	6.00	30	15	2.24	0.018	0.791	large
Type:CLRole.greater.2	non-gamified.Master	3	0.88	2.00	6	15	2.24	0.018	0.791	large
Type:CLRole.two.sided.1	non-gamified.Apprentice	5	3.21	6.00	30	15	2.24	0.036	0.791	large
Type:CLRole.two.sided.2	non-gamified.Master	3	0.88	2.00	6	15	2.24	0.036	0.791	large
Type:CLRole.less.11	non-gamified.Apprentice	5	3.21	6.40	32	17	−0.44	0.347	0.122	small
Type:CLRole.less.21	ont-gamified.Apprentice	8	4.99	7.38	59	17	−0.44	0.347	0.122	small
Type:CLRole.greater.11	non-gamified.Apprentice	5	3.21	6.40	32	17	−0.44	0.677	0.122	small
Type:CLRole.greater.21	ont-gamified.Apprentice	8	4.99	7.38	59	17	−0.44	0.677	0.122	small
Type:CLRole.two.sided.11	non-gamified.Apprentice	5	3.21	6.40	32	17	−0.44	0.692	0.122	small
Type:CLRole.two.sided.21	ont-gamified.Apprentice	8	4.99	7.38	59	17	−0.44	0.692	0.122	small
Type:CLRole.less.12	non-gamified.Apprentice	5	3.21	7.00	35	20	1.57	0.948	0.497	medium
Type:CLRole.less.22	ont-gamified.Master	5	0.75	4.00	20	20	1.57	0.948	0.497	medium
Type:CLRole.greater.12	non-gamified.Apprentice	5	3.21	7.00	35	20	1.57	0.071	0.497	medium
Type:CLRole.greater.22	ont-gamified.Master	5	0.75	4.00	20	20	1.57	0.071	0.497	medium
Type:CLRole.two.sided.12	non-gamified.Apprentice	5	3.21	7.00	35	20	1.57	0.143	0.497	medium
Type:CLRole.two.sided.22	ont-gamified.Master	5	0.75	4.00	20	20	1.57	0.143	0.497	medium
Type:CLRole.less.13	non-gamified.Master	3	0.88	3.33	10	4	−1.64	0.067	0.493	medium
Type:CLRole.less.23	ont-gamified.Apprentice	8	4.99	7.00	56	4	−1.64	0.067	0.493	medium
Type:CLRole.greater.13	non-gamified.Master	3	0.88	3.33	10	4	−1.64	0.958	0.493	medium
Type:CLRole.greater.23	ont-gamified.Apprentice	8	4.99	7.00	56	4	−1.64	0.958	0.493	medium
Type:CLRole.two.sided.13	non-gamified.Master	3	0.88	3.33	10	4	−1.64	0.121	0.493	medium
Type:CLRole.two.sided.23	ont-gamified.Apprentice	8	4.99	7.00	56	4	−1.64	0.121	0.493	medium
Type:CLRole.less.14	non-gamified.Master	3	0.88	4.67	14	8	0.15	0.571	0.053	none
Type:CLRole.less.24	ont-gamified.Master	5	0.75	4.40	22	8	0.15	0.571	0.053	none
Type:CLRole.greater.14	non-gamified.Master	3	0.88	4.67	14	8	0.15	0.464	0.053	none
Type:CLRole.greater.24	ont-gamified.Master	5	0.75	4.40	22	8	0.15	0.464	0.053	none
Type:CLRole.two.sided.14	non-gamified.Master	3	0.88	4.67	14	8	0.15	0.929	0.053	none
Type:CLRole.two.sided.24	ont-gamified.Master	5	0.75	4.40	22	8	0.15	0.929	0.053	none
Type:CLRole.less.15	ont-gamified.Apprentice	8	4.99	8.12	65	29	1.32	0.907	0.366	medium
Type:CLRole.less.25	ont-gamified.Master	5	0.75	5.20	26	29	1.32	0.907	0.366	medium
Type:CLRole.greater.15	ont-gamified.Apprentice	8	4.99	8.12	65	29	1.32	0.102	0.366	medium
Type:CLRole.greater.25	ont-gamified.Master	5	0.75	5.20	26	29	1.32	0.102	0.366	medium

Table 3: *(continued)*

	Group	N	Median	Mean.Ranks	Sum.Ranks	U	Z	p.value	r	magnitude
Type:CLRole.two.sided.15	ont-gamified.Apprentice	8	4.99	8.12	65	29	1.32	0.204	0.366	medium
Type:CLRole.two.sided.25	ont-gamified.Master	5	0.75	5.20	26	29	1.32	0.204	0.366	medium