Summary of nonparametric statistics analysis for the scores of Perceived Choice in the third study for signed up students

Table 1: Summary of Scheirer-Ray-Hare results for the scores of Perceived Choice in the third study for signed up students

| | Df | Sum Sq | Н | p.value | Sig |
|------------------|----|----------|-------|---------|-----|
| Type | | | | | |
| Type:Type | 1 | 1229.745 | 5.587 | 0.018 | * |
| Type:CLRole | 1 | 58.513 | 0.266 | 0.606 | |
| Type:Type:CLRole | 1 | 274.660 | 1.248 | 0.264 | |
| Type:Residuals | 47 | 9442.582 | | | |

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

Table 2: Descriptive statistic of the pair wilcoxon analysis for the scores of Perceived Choice in the third study for signed up students

| | Group | N | Median | Mean.Ranks | Sum.Ranks | U | Z | p.value | r | magnitude |
|--------------------------|-------------------------|---------|--------|------------|-----------|-------|------|---------|-------|-----------|
| Type.greater.1 | ont-gamified | 24 | 4.8 | 31.21 | 749.0 | 449.0 | 2.36 | 0.009 | 0.331 | medium |
| Type.greater.2 | w/o-gamified | 27 | 3.8 | 21.37 | 577.0 | 449.0 | 2.36 | 0.009 | 0.331 | medium |
| Type.two.sided.1 | ont-gamified | 24 | 4.8 | 31.21 | 749.0 | 449.0 | 2.36 | 0.017 | 0.331 | medium |
| Type.two.sided.2 | w/o-gamified | 27 | 3.8 | 21.37 | 577.0 | 449.0 | 2.36 | 0.017 | 0.331 | medium |
| Type:CLRole.greater.1 | ont-gamified.Master | 9 | 5.4 | 19.56 | 176.0 | 131.0 | 2.25 | 0.012 | 0.424 | medium |
| Type:CLRole.greater.2 | w/o-gamified.Apprentice | 19 | 4.0 | 12.11 | 230.0 | 131.0 | 2.25 | 0.012 | 0.424 | medium |
| Type:CLRole.two.sided.1 | ont-gamified.Master | 9 | 5.4 | 19.56 | 176.0 | 131.0 | 2.25 | 0.023 | 0.424 | medium |
| Type:CLRole.two.sided.2 | w/o-gamified.Apprentice | 19 | 4.0 | 12.11 | 230.0 | 131.0 | 2.25 | 0.023 | 0.424 | medium |
| Type:CLRole.greater.11 | ont-gamified.Master | 9 | 5.4 | 11.50 | 103.5 | 58.5 | 2.17 | 0.015 | 0.526 | large |
| Type:CLRole.greater.21 | w/o-gamified.Master | 8 | 3.2 | 6.19 | 49.5 | 58.5 | 2.17 | 0.015 | 0.526 | large |
| Type:CLRole.two.sided.11 | ont-gamified.Master | 9 | 5.4 | 11.50 | 103.5 | 58.5 | 2.17 | 0.029 | 0.526 | large |
| Type:CLRole.two.sided.21 | w/o-gamified.Master | 8 | 3.2 | 6.19 | 49.5 | 58.5 | 2.17 | 0.029 | 0.526 | large |

Table 3: Full descriptive statistic of the pair wilcoxon analysis for the scores of Perceived Choice in the third study for signed up students

| Type.less.2 Type.greater.1 Type.greater.2 Type.two.sided.1 Type.two.sided.2 Type:CLRole.less.1 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified w/o-gamified ont-gamified w/o-gamified w/o-gamified ont-gamified w/o-gamified ont-gamified. Apprentice ont-gamified. Master ont-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Apprentice w/o-gamified. Apprentice | 24 27 24 27 24 27 15 9 15 9 | 4.8 3.8 4.8 3.8 4.8 3.8 4.6 5.4 4.6 5.4 | 31.21 21.37 31.21 21.37 31.21 21.37 11.20 14.67 | 749.0 577.0 749.0 577.0 749.0 577.0 168.0 132.0 168.0 | 449.0 449.0 449.0 449.0 449.0 449.0 48.0 48.0 | 2.36 2.36 2.36 2.36 2.36 2.36 -1.17 -1.17 | 0.992 0.992 0.009 0.009 0.017 0.017 0.128 0.128 | 0.331 0.331 0.331 0.331 0.331 0.331 0.238 0.238 | medium medium medium medium medium small small |
|--|--|--|--|--|---|--|--|--|--|--|
| Type.greater.1 Type.greater.2 Type.two.sided.1 Type.two.sided.2 Type:CLRole.less.1 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.1 Type:CLRole.less.11 | ont-gamified w/o-gamified ont-gamified w/o-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Master ont-gamified. Master ont-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Apprentice | 24 27 24 27 15 9 15 | 4.8 3.8 4.8 3.8 4.6 5.4 4.6 5.4 | 31.21 21.37 31.21 21.37 11.20 14.67 11.20 | 749.0 577.0 749.0 577.0 168.0 132.0 168.0 | 449.0 449.0 449.0 449.0 48.0 48.0 | 2.36 2.36 2.36 2.36 -1.17 -1.17 | 0.009 0.009 0.017 0.017 0.128 | 0.331 0.331 0.331 0.331 0.238 | medium medium medium medium small |
| Type.greater.2 Type.two.sided.1 Type.two.sided.2 Type:CLRole.less.1 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | w/o-gamified ont-gamified w/o-gamified. Apprentice ont-gamified. Master ont-gamified. Master ont-gamified. Master ont-gamified. Apprentice ont-gamified. Master ont-gamified. Apprentice | 27 24 27 15 9 15 9 | 3.8 4.8 3.8 4.6 5.4 4.6 5.4 | 21.37 31.21 21.37 11.20 14.67 11.20 | 577.0 749.0 577.0 168.0 132.0 168.0 | 449.0 449.0 449.0 48.0 48.0 | 2.36 2.36 2.36 -1.17 -1.17 | 0.009 0.017 0.017 0.128 | 0.331 0.331 0.331 0.238 | medium medium medium small |
| Type:two.sided.1 Type:two.sided.2 Type:CLRole.less.1 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.two.sided.2 | ont-gamified w/o-gamified ont-gamified. Apprentice ont-gamified. Master ont-gamified. Master ont-gamified. Master ont-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Apprentice ont-gamified. Apprentice | 24 27 15 9 15 9 | 4.8 3.8 4.6 5.4 4.6 5.4 | 31.21 21.37 11.20 14.67 11.20 | 749.0 577.0 168.0 132.0 168.0 | 449.0 449.0 48.0 48.0 | 2.36 2.36 -1.17 -1.17 | $0.017 \\ 0.017 \\ 0.128$ | 0.331 0.331 0.238 | medium medium small |
| Type:two.sided.2 Type:CLRole.less.1 Type:CLRole.less.2 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | w/o-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice | 27 15 9 15 9 15 | 3.8 4.6 5.4 4.6 5.4 | 21.37 11.20 14.67 11.20 | 577.0 168.0 132.0 168.0 | 449.0 48.0 48.0 | 2.36 -1.17 -1.17 | $0.017 \\ 0.128$ | $0.331 \\ 0.238$ | medium small |
| Type:CLRole.less.1 Type:CLRole.less.2 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice | 15 9 15 9 15 | 4.6 5.4 4.6 5.4 | 11.20 14.67 11.20 | 168.0 132.0 168.0 | $48.0 \\ 48.0$ | $-1.17 \\ -1.17$ | 0.128 | 0.238 | small |
| Type:CLRole.less.2 Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice | 9 15 9 15 | $5.4 \\ 4.6 \\ 5.4$ | 14.67 11.20 | 132.0 168.0 | 48.0 | -1.17 | | | |
| Type:CLRole.greater.1 Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified. Apprentice ont-gamified. Master ont-gamified. Apprentice ont-gamified. Master ont-gamified. Apprentice | 15 9 15 | 4.6 5.4 | 11.20 | 168.0 | | | 0.128 | 0.238 | amell |
| Type:CLRole.greater.2 Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified.Master ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice | 9 15 | 5.4 | | | 48.0 | 1 17 | | 0.236 | Sillall |
| Type:CLRole.two.sided.1 Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified.Apprentice ont-gamified.Master ont-gamified.Apprentice | 15 | | 14.67 | | | -1.17 | 0.878 | 0.238 | small |
| Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified.Master ont-gamified.Apprentice | | 4.6 | | 132.0 | 48.0 | -1.17 | 0.878 | 0.238 | small |
| Type:CLRole.two.sided.2 Type:CLRole.less.11 | ont-gamified.Master ont-gamified.Apprentice | 9 | | 11.20 | 168.0 | 48.0 | -1.17 | 0.256 | 0.238 | small |
| Type:CLRole.less.11 | | | 5.4 | 14.67 | 132.0 | 48.0 | -1.17 | 0.256 | 0.238 | small |
| m or n i i | w/o-gamified Apprentice | 15 | 4.6 | 19.80 | 297.0 | 177.0 | 1.20 | 0.885 | 0.206 | small |
| Type:CLRole.less.21 | | 19 | 4.0 | 15.68 | 298.0 | 177.0 | 1.20 | 0.885 | 0.206 | small |
| | ont-gamified.Apprentice | 15 | 4.6 | 19.80 | 297.0 | 177.0 | 1.20 | 0.118 | 0.206 | small |
| Type:CLRole.greater.21 | w/o-gamified.Apprentice | 19 | 4.0 | 15.68 | 298.0 | 177.0 | 1.20 | 0.118 | 0.206 | small |
| | ont-gamified.Apprentice | 15 | 4.6 | 19.80 | 297.0 | 177.0 | 1.20 | 0.237 | 0.206 | small |
| | w/o-gamified.Apprentice | 19 | 4.0 | 15.68 | 298.0 | 177.0 | 1.20 | 0.237 | 0.206 | small |
| | ont-gamified.Apprentice | 15 | 4.6 | 13.50 | 202.5 | 82.5 | 1.46 | 0.928 | 0.304 | medium |
| | w/o-gamified.Master | 8 | 3.2 | 9.19 | 73.5 | 82.5 | 1.46 | 0.928 | 0.304 | medium |
| | ont-gamified.Apprentice | 15 | 4.6 | 13.50 | 202.5 | 82.5 | 1.46 | 0.076 | 0.304 | medium |
| | w/o-gamified.Master | 8 | 3.2 | 9.19 | 73.5 | 82.5 | 1.46 | 0.076 | 0.304 | medium |
| | ont-gamified.Apprentice | 15 | 4.6 | 13.50 | 202.5 | 82.5 | 1.46 | 0.153 | 0.304 | medium |
| | w/o-gamified.Master | 8 | 3.2 | 9.19 | 73.5 | 82.5 | 1.46 | 0.153 | 0.304 | medium |
| | ont-gamified.Master | 9 | 5.4 | 19.56 | 176.0 | 131.0 | 2.25 | 0.989 | 0.424 | medium |
| Type:CLRole.less.23 | w/o-gamified.Apprentice | 19 | 4.0 | 12.11 | 230.0 | 131.0 | 2.25 | 0.989 | 0.424 | medium |
| | ont-gamified.Master | 9 | 5.4 | 19.56 | 176.0 | 131.0 | 2.25 | 0.012 | 0.424 | medium |
| | w/o-gamified.Apprentice | 19 | 4.0 | 12.11 | 230.0 | 131.0 | 2.25 | 0.012 | 0.424 | medium |
| | ont-gamified.Master | 9 | 5.4 | 19.56 | 176.0 | 131.0 | 2.25 | 0.023 | 0.424 | medium |
| 31 | w/o-gamified.Apprentice | 19 | 4.0 | 12.11 | 230.0 | 131.0 | 2.25 | 0.023 | 0.424 | medium |
| | ont-gamified.Master | 9 | 5.4 | 11.50 | 103.5 | 58.5 | 2.17 | 0.987 | 0.526 | large |
| | w/o-gamified.Master | 8 | 3.2 | 6.19 | 49.5 | 58.5 | 2.17 | 0.987 | 0.526 | large |
| | ont-gamified.Master | 9 | 5.4 | 11.50 | 103.5 | 58.5 | 2.17 | 0.015 | 0.526 | large |
| | w/o-gamified.Master | 8 | 3.2 | 6.19 | 49.5 | 58.5 | 2.17 | 0.015 | 0.526 | large |
| | ont-gamified.Master | 9 | 5.4 | 11.50 | 103.5 | 58.5 | 2.17 | 0.029 | 0.526 | large |
| | w/o-gamified.Master | 8 | 3.2 | 6.19 | 49.5 | 58.5 | 2.17 | 0.029 | 0.526 | large |
| | w/o-gamified.Apprentice | 19 | 4.0 | 14.37 | 273.0 | 83.0 | 0.37 | 0.647 | 0.072 | none |
| | w/o-gamified.Master | 8 | 3.2 | 13.12 | 105.0 | 83.0 | 0.37 | 0.647 | 0.072 | none |
| | w/o-gamified.Apprentice | 19 | 4.0 | 14.37 | 273.0 | 83.0 | 0.37 | 0.362 | 0.072 | none |
| | w/o-gamified.Master | 8 | 3.2 | 13.12 | 105.0 | 83.0 | 0.37 | 0.362 | 0.072 | none |

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 | 4.0 | 14.37 | 273.0 | 83.0 | 0.37 | 0.724 | 0.072 | none |
| Type:CLRole.two.sided.25 | w/o-gamified.Master | 8 | 3.2 | 13.12 | 105.0 | 83.0 | 0.37 | 0.724 | 0.072 | none |