

Summary of correlation analysis between participants' motivation and learning outcomes in the pilot empirical study

1 Difference of Scores and Motivation

Table 1: Correlation matrix of Difference of Scores and Motivation between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	-0.2984	-0.2613	-0.2956	0.1979	0.0266
Intrinsic Motivation	-0.2984	1.0000	0.8533	0.7173	-0.6191	0.4526
Interest/Enjoyment	-0.2613	0.8533	1.0000	0.3995	-0.3812	0.3517
Perceived Choice	-0.2956	0.7173	0.3995	1.0000	-0.5210	0.1448
Pressure/Tension	0.1979	-0.6191	-0.3812	-0.5210	1.0000	0.0342
Effort/Importance	0.0266	0.4526	0.3517	0.1448	0.0342	1.0000

method: spearman

Table 2: Correlation matrix with p-values of Difference of Scores and Motivation between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.1305	0.1879	0.1345	0.3224	0.8951
Intrinsic Motivation	0.1305	0.0000	0.0000	0.0000	0.0006	0.0178
Interest/Enjoyment	0.1879	0.0000	0.0000	0.0390	0.0498	0.0720
Perceived Choice	0.1345	0.0000	0.0390	0.0000	0.0053	0.4712
Pressure/Tension	0.3224	0.0006	0.0498	0.0053	0.0000	0.8654
Effort/Importance	0.8951	0.0178	0.0720	0.4712	0.8654	0.0000

method: spearman

2 Difference of Scores and Motivation for the group non-gamified

Table 3: Correlation matrix of Difference of Scores and Motivation for the group non-gamified between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	-0.0386	-0.0180	0.0875	-0.0512	-0.2006
Intrinsic Motivation	-0.0386	1.0000	0.6860	0.7867	-0.5572	0.4303
Interest/Enjoyment	-0.0180	0.6860	1.0000	0.2833	-0.0041	0.3389
Perceived Choice	0.0875	0.7867	0.2833	1.0000	-0.4979	0.2253
Pressure/Tension	-0.0512	-0.5572	-0.0041	-0.4979	1.0000	0.1205
Effort/Importance	-0.2006	0.4303	0.3389	0.2253	0.1205	1.0000

method: spearman

Table 4: Correlation matrix with p-values of Difference of Scores and Motivation for the group non-gamified between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.9005	0.9536	0.7762	0.8681	0.5112
Intrinsic Motivation	0.9005	0.0000	0.0096	0.0014	0.0479	0.1421
Interest/Enjoyment	0.9536	0.0096	0.0000	0.3482	0.9893	0.2574
Perceived Choice	0.7762	0.0014	0.3482	0.0000	0.0833	0.4592
Pressure/Tension	0.8681	0.0479	0.9893	0.0833	0.0000	0.6950
Effort/Importance	0.5112	0.1421	0.2574	0.4592	0.6950	0.0000

method: spearman

3 Difference of Scores and Motivation for the group ont-gamified

Table 5: Correlation matrix of Difference of Scores and Motivation for the group ont-gamified between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	-0.3656	-0.3980	-0.3496	0.2730	0.2439
Intrinsic Motivation	-0.3656	1.0000	0.7855	0.6556	-0.5692	0.5445
Interest/Enjoyment	-0.3980	0.7855	1.0000	0.2950	-0.4024	0.3092
Perceived Choice	-0.3496	0.6556	0.2950	1.0000	-0.3471	0.2355
Pressure/Tension	0.2730	-0.5692	-0.4024	-0.3471	1.0000	0.0045
Effort/Importance	0.2439	0.5445	0.3092	0.2355	0.0045	1.0000

method: spearman

Table 6: Correlation matrix with p-values of Difference of Scores and Motivation for the group ont-gamified between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.1986	0.1587	0.2205	0.3449	0.4008
Intrinsic Motivation	0.1986	0.0000	0.0009	0.0109	0.0336	0.0441
Interest/Enjoyment	0.1587	0.0009	0.0000	0.3058	0.1537	0.2820
Perceived Choice	0.2205	0.0109	0.3058	0.0000	0.2241	0.4177
Pressure/Tension	0.3449	0.0336	0.1537	0.2241	0.0000	0.9879
Effort/Importance	0.4008	0.0441	0.2820	0.4177	0.9879	0.0000

method: spearman

4 Difference of Scores and Motivation for the group Apprentice

Table 7: Correlation matrix of Difference of Scores and Motivation for the group Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	-0.1572	-0.1059	-0.2001	0.2228	0.1992
Intrinsic Motivation	-0.1572	1.0000	0.7982	0.6636	-0.6160	0.5416
Interest/Enjoyment	-0.1059	0.7982	1.0000	0.2533	-0.3271	0.4711
Perceived Choice	-0.2001	0.6636	0.2533	1.0000	-0.5000	0.1643
Pressure/Tension	0.2228	-0.6160	-0.3271	-0.5000	1.0000	0.0311
Effort/Importance	0.1992	0.5416	0.4711	0.1643	0.0311	1.0000

method: spearman

Table 8: Correlation matrix with p-values of Difference of Scores and Motivation for the group Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.4963	0.6477	0.3844	0.3317	0.3866
Intrinsic Motivation	0.4963	0.0000	0.0000	0.0010	0.0029	0.0112
Interest/Enjoyment	0.6477	0.0000	0.0000	0.2678	0.1478	0.0311
Perceived Choice	0.3844	0.0010	0.2678	0.0000	0.0210	0.4768
Pressure/Tension	0.3317	0.0029	0.1478	0.0210	0.0000	0.8934
Effort/Importance	0.3866	0.0112	0.0311	0.4768	0.8934	0.0000

method: spearman

5 Difference of Scores and Motivation for the group Master

Table 9: Correlation matrix of Difference of Scores and Motivation for the group Master between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	-0.7247	-0.6957	-0.6912	0.4058	-0.0882
Intrinsic Motivation	-0.7247	1.0000	0.8857	0.9856	-0.7143	0.1449
Interest/Enjoyment	-0.6957	0.8857	1.0000	0.9276	-0.7714	-0.3189
Perceived Choice	-0.6912	0.9856	0.9276	1.0000	-0.7827	0.0147
Pressure/Tension	0.4058	-0.7143	-0.7714	-0.7827	1.0000	0.3189
Effort/Importance	-0.0882	0.1449	-0.3189	0.0147	0.3189	1.0000

method: spearman

Table 10: Correlation matrix with p-values of Difference of Scores and Motivation for the group Master between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.1032	0.1248	0.1283	0.4247	0.8680
Intrinsic Motivation	0.1032	0.0000	0.0333	0.0003	0.1361	0.7841
Interest/Enjoyment	0.1248	0.0333	0.0000	0.0077	0.1028	0.5379
Perceived Choice	0.1283	0.0003	0.0077	0.0000	0.0657	0.9779
Pressure/Tension	0.4247	0.1361	0.1028	0.0657	0.0000	0.5379
Effort/Importance	0.8680	0.7841	0.5379	0.9779	0.5379	0.0000

method: spearman

6 Difference of Scores and Motivation for the group non-gamified.Apprentice

Table 11: Correlation matrix of Difference of Scores and Motivation for the group non-gamified.Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	0.0502	0.0711	-0.0624	-0.0206	-0.0529
Intrinsic Motivation	0.0502	1.0000	0.6758	0.8368	-0.5982	0.4165
Interest/Enjoyment	0.0711	0.6758	1.0000	0.3002	0.0344	0.4115
Perceived Choice	-0.0624	0.8368	0.3002	1.0000	-0.6028	0.2824
Pressure/Tension	-0.0206	-0.5982	0.0344	-0.6028	1.0000	0.0713
Effort/Importance	-0.0529	0.4165	0.4115	0.2824	0.0713	1.0000

method: spearman

Table 12: Correlation matrix with p-values of Difference of Scores and Motivation for the group non-gamified.Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.8834	0.8354	0.8555	0.9520	0.8773
Intrinsic Motivation	0.8834	0.0000	0.0225	0.0013	0.0519	0.2026
Interest/Enjoyment	0.8354	0.0225	0.0000	0.3697	0.9200	0.2086
Perceived Choice	0.8555	0.0013	0.3697	0.0000	0.0497	0.4001
Pressure/Tension	0.9520	0.0519	0.9200	0.0497	0.0000	0.8351
Effort/Importance	0.8773	0.2026	0.2086	0.4001	0.8351	0.0000

method: spearman

7 Difference of Scores and Motivation for the group non-gamified.Master

Table 13: Correlation matrix of Difference of Scores and Motivation for the group non-gamified.Master between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1	-1	1		-1	-1
Intrinsic Motivation	-1	1	-1		1	1
Interest/Enjoyment	1	-1	1		-1	-1
Perceived Choice				1		
Pressure/Tension	-1	1	-1		1	1
Effort/Importance	-1	1	-1		1	1

method: spearman

Table 14: Correlation matrix with p-values of Difference of Scores and Motivation for the group non-gamified.Master between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0	1	1		1	1
Intrinsic Motivation	1	0	1		1	1
Interest/Enjoyment	1	1	0		1	1
Perceived Choice				0		
Pressure/Tension	1	1	1		0	1
Effort/Importance	1	1	1		1	0

method: spearman

8 Difference of Scores and Motivation for the group ont-gamified.Apprentice

Table 15: Correlation matrix of Difference of Scores and Motivation for the group ont-gamified.Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0000	-0.1394	-0.0303	-0.0424	0.2378	0.5505
Intrinsic Motivation	-0.1394	1.0000	0.7333	0.5030	-0.5244	0.5138
Interest/Enjoyment	-0.0303	0.7333	1.0000	0.0061	-0.4207	0.3731
Perceived Choice	-0.0424	0.5030	0.0061	1.0000	-0.1890	0.1101
Pressure/Tension	0.2378	-0.5244	-0.4207	-0.1890	1.0000	0.1354
Effort/Importance	0.5505	0.5138	0.3731	0.1101	0.1354	1.0000

method: spearman

Table 16: Correlation matrix with p-values of Difference of Scores and Motivation for the group ont-gamified.Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.7072	0.9457	0.9186	0.5082	0.0992
Intrinsic Motivation	0.7072	0.0000	0.0212	0.1434	0.1197	0.1287
Interest/Enjoyment	0.9457	0.0212	0.0000	1.0000	0.2260	0.2883
Perceived Choice	0.9186	0.1434	1.0000	0.0000	0.6010	0.7621
Pressure/Tension	0.5082	0.1197	0.2260	0.6010	0.0000	0.7092
Effort/Importance	0.0992	0.1287	0.2883	0.7621	0.7092	0.0000

method: spearman

9 Difference of Scores and Motivation for the group ont-gamified.Master

Table 17: Correlation matrix of Difference of Scores and Motivation for the group ont-gamified.Master between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	1.0	-0.8	-1.0	-0.8	0.6	0.2
Intrinsic Motivation	-0.8	1.0	0.8	1.0	-0.8	0.4
Interest/Enjoyment	-1.0	0.8	1.0	0.8	-0.6	-0.2
Perceived Choice	-0.8	1.0	0.8	1.0	-0.8	0.4
Pressure/Tension	0.6	-0.8	-0.6	-0.8	1.0	-0.2
Effort/Importance	0.2	0.4	-0.2	0.4	-0.2	1.0

method: spearman

Table 18: Correlation matrix with p-values of Difference of Scores and Motivation for the group ont-gamified.Master between participants' motivation and learning outcomes in the pilot empirical study

round	Diff of Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diff of Scores	0.0000	0.3333	0.0833	0.3333	0.4167	0.9167
Intrinsic Motivation	0.3333	0.0000	0.3333	0.0833	0.3333	0.7500
Interest/Enjoyment	0.0833	0.3333	0.0000	0.3333	0.4167	0.9167
Perceived Choice	0.3333	0.0833	0.3333	0.0000	0.3333	0.7500
Pressure/Tension	0.4167	0.3333	0.4167	0.3333	0.0000	0.9167
Effort/Importance	0.9167	0.7500	0.9167	0.7500	0.9167	0.0000

method: spearman