

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

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1 Gains in Skill/Knowledge and Motivation

Table 1: Correlation matrix of Gains in Skill/Knowledge and Motivation between participants' motivation and learning outcomes in the pilot empirical study

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	-0.2047	-0.1656	-0.2050	0.1235	0.1363
Intrinsic Motivation	-0.2047	1.0000	0.8820	0.5650	-0.5777	0.3183
Interest/Enjoyment	-0.1656	0.8820	1.0000	0.3877	-0.4633	0.2450
Perceived Choice	-0.2050	0.5650	0.3877	1.0000	-0.4617	0.0381
Pressure/Tension	0.1235	-0.5777	-0.4633	-0.4617	1.0000	0.1907
Effort/Importance	0.1363	0.3183	0.2450	0.0381	0.1907	1.0000

method: spearman

Table 2: Correlation matrix with p-values of Gains in Skill/Knowledge and Motivation between participants' motivation and learning outcomes in the pilot empirical study

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.4007	0.4980	0.3998	0.6144	0.5778
Intrinsic Motivation	0.4007	0.0000	0.0000	0.0117	0.0096	0.1841
Interest/Enjoyment	0.4980	0.0000	0.0000	0.1010	0.0457	0.3120
Perceived Choice	0.3998	0.0117	0.1010	0.0000	0.0466	0.8770
Pressure/Tension	0.6144	0.0096	0.0457	0.0466	0.0000	0.4342
Effort/Importance	0.5778	0.1841	0.3120	0.8770	0.4342	0.0000

method: spearman

2 Gains in Skill/Knowledge and Motivation for the group non-gamified

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	0.0721	0.3784	0.3945	0.1802	0.1182
Intrinsic Motivation	0.0721	1.0000	0.6786	0.3637	-0.2143	0.3784
Interest/Enjoyment	0.3784	0.6786	1.0000	0.0546	0.1429	0.1982
Perceived Choice	0.3945	0.3637	0.0546	1.0000	-0.5092	-0.1376
Pressure/Tension	0.1802	-0.2143	0.1429	-0.5092	1.0000	0.3784
Effort/Importance	0.1182	0.3784	0.1982	-0.1376	0.3784	1.0000

method: spearman

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.8780	0.4026	0.3811	0.6990	0.8008
Intrinsic Motivation	0.8780	0.0000	0.1095	0.4226	0.6615	0.4026
Interest/Enjoyment	0.4026	0.1095	0.0000	0.9075	0.7825	0.6701
Perceived Choice	0.3811	0.4226	0.9075	0.0000	0.2431	0.7686
Pressure/Tension	0.6990	0.6615	0.7825	0.2431	0.0000	0.4026
Effort/Importance	0.8008	0.4026	0.6701	0.7686	0.4026	0.0000

method: spearman

3 Gains in Skill/Knowledge and Motivation for the group ont-gamified

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	-0.4772	-0.5123	-0.3996	0.4137	0.3215
Intrinsic Motivation	-0.4772	1.0000	0.9161	0.6105	-0.5895	0.3646
Interest/Enjoyment	-0.5123	0.9161	1.0000	0.4070	-0.5404	0.3221

method: spearman

Table 5: (continued)

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Perceived Choice	-0.3996	0.6105	0.4070	1.0000	-0.4049	0.2522
Pressure/Tension	0.4137	-0.5895	-0.5404	-0.4049	1.0000	0.0018
Effort/Importance	0.3215	0.3646	0.3221	0.2522	0.0018	1.0000
method: spearman						

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.1167	0.0886	0.1980	0.1812	0.3082
Intrinsic Motivation	0.1167	0.0000	0.0000	0.0350	0.0437	0.2439
Interest/Enjoyment	0.0886	0.0000	0.0000	0.1891	0.0697	0.3072
Perceived Choice	0.1980	0.0350	0.1891	0.0000	0.1916	0.4290
Pressure/Tension	0.1812	0.0437	0.0697	0.1916	0.0000	0.9956
Effort/Importance	0.3082	0.2439	0.3072	0.4290	0.9956	0.0000
method: spearman						

4 Gains in Skill/Knowledge and Motivation for the group Apprentice

Table 7: Correlation matrix of Gains in Skill/Knowledge and Motivation for the group Apprentice between participants' motivation and learning outcomes in the pilot empirical study

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	0.0358	0.0648	-0.2607	0.0870	0.2524
Intrinsic Motivation	0.0358	1.0000	0.8776	0.4127	-0.6501	0.4177
Interest/Enjoyment	0.0648	0.8776	1.0000	0.1488	-0.4455	0.4972
Perceived Choice	-0.2607	0.4127	0.1488	1.0000	-0.3752	0.0429
Pressure/Tension	0.0870	-0.6501	-0.4455	-0.3752	1.0000	0.2233
Effort/Importance	0.2524	0.4177	0.4972	0.0429	0.2233	1.0000
method: spearman						

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.9075	0.8333	0.3897	0.7774	0.4054
Intrinsic Motivation	0.9075	0.0000	0.0001	0.1611	0.0161	0.1555
Interest/Enjoyment	0.8333	0.0001	0.0000	0.6277	0.1271	0.0838
Perceived Choice	0.3897	0.1611	0.6277	0.0000	0.2065	0.8892
Pressure/Tension	0.7774	0.0161	0.1271	0.2065	0.0000	0.4633
Effort/Importance	0.4054	0.1555	0.0838	0.8892	0.4633	0.0000
method: spearman						

5 Gains in Skill/Knowledge and Motivation for the group Master

Table 9: Correlation matrix of Gains in Skill/Knowledge and Motivation for the group Master between participants' motivation and learning outcomes in the pilot empirical study

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	-0.8697	-0.5798	-0.6471	0.4058	-0.2500
Intrinsic Motivation	-0.8697	1.0000	0.8286	0.8407	-0.4857	0.1160
Interest/Enjoyment	-0.5798	0.8286	1.0000	0.9276	-0.7714	-0.3189
Perceived Choice	-0.6471	0.8407	0.9276	1.0000	-0.7827	0.0147
Pressure/Tension	0.4058	-0.4857	-0.7714	-0.7827	1.0000	0.3189
Effort/Importance	-0.2500	0.1160	-0.3189	0.0147	0.3189	1.0000
method: spearman						

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.0244	0.2278	0.1649	0.4247	0.6328
Intrinsic Motivation	0.0244	0.0000	0.0583	0.0361	0.3556	0.8268
Interest/Enjoyment	0.2278	0.0583	0.0000	0.0077	0.1028	0.5379
Perceived Choice	0.1649	0.0361	0.0077	0.0000	0.0657	0.9779
Pressure/Tension	0.4247	0.3556	0.1028	0.0657	0.0000	0.5379
Effort/Importance	0.6328	0.8268	0.5379	0.9779	0.5379	0.0000
method: spearman						

6 Gains in Skill/Knowledge and Motivation for the group non-gamified.Apprentice

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	0.1026	0.5643	-0.7105	0.4104	0.6579
Intrinsic Motivation	0.1026	1.0000	0.8000	0.3591	-0.2000	0.2052
Interest/Enjoyment	0.5643	0.8000	1.0000	-0.2052	0.3000	0.6669
Perceived Choice	-0.7105	0.3591	-0.2052	1.0000	-0.8721	-0.3947
Pressure/Tension	0.4104	-0.2000	0.3000	-0.8721	1.0000	0.3591
Effort/Importance	0.6579	0.2052	0.6669	-0.3947	0.3591	1.0000

method: spearman

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.8696	0.3217	0.1786	0.4925	0.2275
Intrinsic Motivation	0.8696	0.0000	0.1333	0.5528	0.7833	0.7406
Interest/Enjoyment	0.3217	0.1333	0.0000	0.7406	0.6833	0.2189
Perceived Choice	0.1786	0.5528	0.7406	0.0000	0.0539	0.5108
Pressure/Tension	0.4925	0.7833	0.6833	0.0539	0.0000	0.5528
Effort/Importance	0.2275	0.7406	0.2189	0.5108	0.5528	0.0000

method: spearman

7 Gains in Skill/Knowledge and Motivation for the group non-gamified.Master

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	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 Gains in Skill/Knowledge and Motivation for the group non-gamified.Master between participants' motivation and learning outcomes in the pilot empirical study

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	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 Gains in Skill/Knowledge and Motivation for the group ont-gamified.Apprentice

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	-0.3114	-0.1796	-0.0599	0.4424	0.4817
Intrinsic Motivation	-0.3114	1.0000	0.9048	0.4762	-0.6627	0.4849
Interest/Enjoyment	-0.1796	0.9048	1.0000	0.1905	-0.6025	0.5213
Perceived Choice	-0.0599	0.4762	0.1905	1.0000	-0.1928	0.2425
Pressure/Tension	0.4424	-0.6627	-0.6025	-0.1928	1.0000	0.1350
Effort/Importance	0.4817	0.4849	0.5213	0.2425	0.1350	1.0000

method: spearman

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.4528	0.6703	0.8880	0.2723	0.2268
Intrinsic Motivation	0.4528	0.0000	0.0046	0.2431	0.0733	0.2232
Interest/Enjoyment	0.6703	0.0046	0.0000	0.6646	0.1140	0.1852
Perceived Choice	0.8880	0.2431	0.6646	0.0000	0.6474	0.5629
Pressure/Tension	0.2723	0.0733	0.1140	0.6474	0.0000	0.7500
Effort/Importance	0.2268	0.2232	0.1852	0.5629	0.7500	0.0000

method: spearman

9 Gains in Skill/Knowledge and Motivation for the group ont-gamified.Master

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	1.0000	-0.9487	-0.9487	-0.9487	0.7379	-0.1054
Intrinsic Motivation	-0.9487	1.0000	1.0000	0.8000	-0.6000	-0.2000
Interest/Enjoyment	-0.9487	1.0000	1.0000	0.8000	-0.6000	-0.2000
Perceived Choice	-0.9487	0.8000	0.8000	1.0000	-0.8000	0.4000
Pressure/Tension	0.7379	-0.6000	-0.6000	-0.8000	1.0000	-0.2000
Effort/Importance	-0.1054	-0.2000	-0.2000	0.4000	-0.2000	1.0000

method: spearman

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

round	Gains in Skill/Knowledge	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Gains in Skill/Knowledge	0.0000	0.0513	0.0513	0.0513	0.2621	0.8946
Intrinsic Motivation	0.0513	0.0000	0.0833	0.3333	0.4167	0.9167
Interest/Enjoyment	0.0513	0.0833	0.0000	0.3333	0.4167	0.9167
Perceived Choice	0.0513	0.3333	0.3333	0.0000	0.3333	0.7500
Pressure/Tension	0.2621	0.4167	0.4167	0.3333	0.0000	0.9167
Effort/Importance	0.8946	0.9167	0.9167	0.7500	0.9167	0.0000

method: spearman