

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	-0.0158	-0.1486	0.0218	-0.3655	0.0539
Intrinsic Motivation	-0.0158	1.0000	0.8838	0.5862	-0.4023	0.2252
Interest/Enjoyment	-0.1486	0.8838	1.0000	0.4474	-0.2295	0.0499
Perceived Choice	0.0218	0.5862	0.4474	1.0000	0.0100	-0.1623
Pressure/Tension	-0.3655	-0.4023	-0.2295	0.0100	1.0000	-0.0090
Effort/Importance	0.0539	0.2252	0.0499	-0.1623	-0.0090	1.0000
method: spearman						

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	0.0000	0.9404	0.4783	0.9176	0.0724	0.7982
Intrinsic Motivation	0.9404	0.0000	0.0000	0.0021	0.0462	0.2792
Interest/Enjoyment	0.4783	0.0000	0.0000	0.0249	0.2699	0.8127
Perceived Choice	0.9176	0.0021	0.0249	0.0000	0.9622	0.4383
Pressure/Tension	0.0724	0.0462	0.2699	0.9622	0.0000	0.9659
Effort/Importance	0.7982	0.2792	0.8127	0.4383	0.9659	0.0000

method: spearman

4 Diference in Scores and Motivation for the group Apprentice

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	0.1643	0.2023	0.0385	−0.1523	−0.0080
Intrinsic Motivation	0.1643	1.0000	0.8660	0.8115	−0.4235	0.2184
Interest/Enjoyment	0.2023	0.8660	1.0000	0.6316	−0.2181	0.1207
Perceived Choice	0.0385	0.8115	0.6316	1.0000	−0.3062	−0.0906
Pressure/Tension	−0.1523	−0.4235	−0.2181	−0.3062	1.0000	0.1247
Effort/Importance	−0.0080	0.2184	0.1207	−0.0906	0.1247	1.0000

method: spearman

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	0.0000	0.4632	0.3665	0.8650	0.4986	0.9719
Intrinsic Motivation	0.4632	0.0000	0.0000	0.0000	0.0495	0.3289
Interest/Enjoyment	0.3665	0.0000	0.0000	0.0016	0.3295	0.5925
Perceived Choice	0.8650	0.0000	0.0016	0.0000	0.1657	0.6885
Pressure/Tension	0.4986	0.0495	0.3295	0.1657	0.0000	0.5803
Effort/Importance	0.9719	0.3289	0.5925	0.6885	0.5803	0.0000

method: spearman

5 Diference in Scores and Motivation for the group Master

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	0.2644	0.0336	0.4593	−0.3570	0.0418
Intrinsic Motivation	0.2644	1.0000	0.8308	0.5213	−0.4639	0.5015
Interest/Enjoyment	0.0336	0.8308	1.0000	0.2258	−0.3757	0.2841
Perceived Choice	0.4593	0.5213	0.2258	1.0000	−0.1852	0.2058
Pressure/Tension	−0.3570	−0.4639	−0.3757	−0.1852	1.0000	0.2159
Effort/Importance	0.0418	0.5015	0.2841	0.2058	0.2159	1.0000

method: spearman

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	0.0000	0.2468	0.8849	0.0362	0.1121	0.8572
Intrinsic Motivation	0.2468	0.0000	0.0000	0.0154	0.0342	0.0206
Interest/Enjoyment	0.8849	0.0000	0.0000	0.3250	0.0933	0.2120
Perceived Choice	0.0362	0.0154	0.3250	0.0000	0.4216	0.3709
Pressure/Tension	0.1121	0.0342	0.0933	0.4216	0.0000	0.3473
Effort/Importance	0.8572	0.0206	0.2120	0.3709	0.3473	0.0000

method: spearman

6 Diference in Scores and Motivation for the group non-gamified.Apprentice

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	0.3818	0.6074	−0.0183	−0.3587	−0.1101
Intrinsic Motivation	0.3818	1.0000	0.7792	0.7622	−0.5413	0.1590
Interest/Enjoyment	0.6074	0.7792	1.0000	0.5432	−0.3759	0.0991
Perceived Choice	−0.0183	0.7622	0.5432	1.0000	−0.6237	−0.2277
Pressure/Tension	−0.3587	−0.5413	−0.3759	−0.6237	1.0000	0.5431
Effort/Importance	−0.1101	0.1590	0.0991	−0.2277	0.5431	1.0000

method: spearman

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	0.0000	0.2790	0.0625	0.9600	0.3087	0.7621
Intrinsic Motivation	0.2790	0.0000	0.0079	0.0104	0.1061	0.6608
Interest/Enjoyment	0.0625	0.0079	0.0000	0.1046	0.2844	0.7854
Perceived Choice	0.9600	0.0104	0.1046	0.0000	0.0540	0.5269
Pressure/Tension	0.3087	0.1061	0.2844	0.0540	0.0000	0.1047
Effort/Importance	0.7621	0.6608	0.7854	0.5269	0.1047	0.0000

method: spearman

7 Diference in Scores and Motivation for the group non-gamified.Master

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	0.8810	0.5784	0.8743	−0.4788	0.7832
Intrinsic Motivation	0.8810	1.0000	0.7952	0.7545	−0.5401	0.6627
Interest/Enjoyment	0.5784	0.7952	1.0000	0.3455	−0.4908	0.2012
Perceived Choice	0.8743	0.7545	0.3455	1.0000	−0.3087	0.8667
Pressure/Tension	−0.4788	−0.5401	−0.4908	−0.3087	1.0000	0.0559
Effort/Importance	0.7832	0.6627	0.2012	0.8667	0.0559	1.0000

method: spearman

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	0.0000	0.0072	0.1331	0.0045	0.2301	0.0215
Intrinsic Motivation	0.0072	0.0000	0.0183	0.0305	0.1670	0.0733
Interest/Enjoyment	0.1331	0.0183	0.0000	0.4020	0.2169	0.6328
Perceived Choice	0.0045	0.0305	0.4020	0.0000	0.4569	0.0053
Pressure/Tension	0.2301	0.1670	0.2169	0.4569	0.0000	0.8954
Effort/Importance	0.0215	0.0733	0.6328	0.0053	0.8954	0.0000

method: spearman

8 Diference in Scores and Motivation for the group ont-gamified.Apprentice

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	−0.2587	−0.2242	−0.0106	0.1943	0.1284
Intrinsic Motivation	−0.2587	1.0000	0.8932	0.8099	−0.3239	0.3102
Interest/Enjoyment	−0.2242	0.8932	1.0000	0.7143	−0.1298	0.1518
Perceived Choice	−0.0106	0.8099	0.7143	1.0000	0.1305	0.0844
Pressure/Tension	0.1943	−0.3239	−0.1298	0.1305	1.0000	−0.3633
Effort/Importance	0.1284	0.3102	0.1518	0.0844	−0.3633	1.0000

method: spearman

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	0.0000	0.4169	0.4837	0.9740	0.5451	0.6909
Intrinsic Motivation	0.4169	0.0000	0.0001	0.0014	0.3044	0.3264
Interest/Enjoyment	0.4837	0.0001	0.0000	0.0091	0.6877	0.6376
Perceived Choice	0.9740	0.0014	0.0091	0.0000	0.6861	0.7943
Pressure/Tension	0.5451	0.3044	0.6877	0.6861	0.0000	0.2457
Effort/Importance	0.6909	0.3264	0.6376	0.7943	0.2457	0.0000

method: spearman

9 Diference in Scores and Motivation for the group ont-gamified.Master

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

round	Diference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Diference in Scores	1.0000	−0.0055	−0.0208	0.3260	−0.0538	−0.1403
Intrinsic Motivation	−0.0055	1.0000	0.8769	0.2924	−0.5247	0.1914
Interest/Enjoyment	−0.0208	0.8769	1.0000	0.1069	−0.5554	−0.0209
Perceived Choice	0.3260	0.2924	0.1069	1.0000	−0.1016	−0.3705
Pressure/Tension	−0.0538	−0.5247	−0.5554	−0.1016	1.0000	0.3447
Effort/Importance	−0.1403	0.1914	−0.0209	−0.3705	0.3447	1.0000

method: spearman

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

round	Difference in Scores	Intrinsic Motivation	Interest/Enjoyment	Perceived Choice	Pressure/Tension	Effort/Importance
Difference in Scores	0.0000	0.9858	0.9463	0.2771	0.8614	0.6476
Intrinsic Motivation	0.9858	0.0000	0.0001	0.3323	0.0656	0.5310
Interest/Enjoyment	0.9463	0.0001	0.0000	0.7280	0.0488	0.9458
Perceived Choice	0.2771	0.3323	0.7280	0.0000	0.7413	0.2127
Pressure/Tension	0.8614	0.0656	0.0488	0.7413	0.0000	0.2488
Effort/Importance	0.6476	0.5310	0.9458	0.2127	0.2488	0.0000
method: spearman						