**Supplement 3.** Supplementary tables

(A) Correlation matrix of the network in the total sample

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CS | IS | OC | M | SC | SL |
| CS |  | 0.476 | 0.302 | 0.000 | 0.091 | 0.029 |
| IS | 0.476 |  | 0.000 | 0.313 | -0.023 | 0.069 |
| OC | 0.302 | 0.313 |  | 0.156 | 0.044 | 0.059 |
| M | 0.000 | 0.000 | 0.156 |  | 0.434 | 0.208 |
| SC | 0.091 | -0.023 | 0.044 | 0.434 |  | 0.501 |
| SL | 0.029 | 0.068 | 0.059 | 0.208 | 0.501 |  |

CS, computer skills; IS, internet skills; OC, online communication; M, online motivation; SC, self-control; SL, self-learning.

(B) Correlation matrix of the network in male students

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CS | IS | OC | M | SC | SL |
| CS |  | 0.535 | 0.340 | 0.000 | 0.064 | 0.000 |
| IS | 0.535 |  | 0.263 | 0.000 | 0.000 | 0.028 |
| OC | 0.340 | 0.263 |  | 0.144 | 0.000 | 0.068 |
| M | 0.000 | 0.000 | 0.144 |  | 0.402 | 0.228 |
| SC | 0.064 | 0.000 | 0.000 | 0.402 |  | 0.573 |
| SL | 0.000 | 0.028 | 0.068 | 0.228 | 0.573 |  |

CS, computer skills; IS, internet skills; OC, online communication; M, online motivation; SC, self-control; SL, self-learning.

(C) Correlation matrix of the network in female students

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CS | IS | OC | M | SC | SL |
| CS |  | 0.424 | 0.272 | 0.030 | 0.077 | 0.077 |
| IS | 0.424 |  | 0.335 | 0.000 | 0.000 | 0.062 |
| OC | 0.271 | 0.335 |  | 0.154 | 0.075 | 0.064 |
| M | 0.030 | 0.000 | 0.154 |  | 0.441 | 0.190 |
| SC | 0.077 | 0.000 | 0.075 | 0.441 |  | 0.453 |
| SL | 0.077 | 0.062 | 0.064 | 0.190 | 0.453 |  |

CS, computer skills; IS, internet skills; OC, online communication; M, online motivation; SC, self-control; SL, self-learning.

(D) Correlation matrix of the network in lower grade students

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | CS | IS | OC | M | SC | SL |
| CS |  | 0.447 | 0.288 | 0.020 | 0.118 | 0.024 |
| IS | 0.447 |  | 0.310 | 0.000 | 0.000 | 0.074 |
| OC | 0.288 | 0.310 |  | 0.166 | 0.057 | 0.054 |
| M | 0.020 | 0.000 | 0.166 |  | 0.392 | 0.204 |
| SC | 0.118 | 0.000 | 0.057 | 0.392 |  | 0.494 |
| SL | 0.024 | 0.074 | 0.054 | 0.204 | 0.494 |  |

CS, computer skills; IS, internet skills; OC, online communication; M, online motivation; SC, self-control; SL, self-learning.

(E) Correlation matrix of the network in higher grade students

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Nodes | CS | IS | OC | M | SC | SL |
| CS |  | 0.495 | 0.300 | 0.000 | 0.044 | 0.054 |
| IS | 0.49 |  | 0.307 | 0.000 | 0.000 | 0.028 |
| OC | 0.301 | 0.307 |  | 0.122 | 0.042 | 0.079 |
| M | 0.000 | 0.000 | 0.122 |  | 0.463 | 0.224 |
| SC | 0.045 | 0.000 | 0.042 | 0.463 |  | 0.486 |
| SL | 0.054 | 0.028 | 0.079 | 0.224 | 0.486 |  |

CS, computer skills; IS, internet skills; OC, online communication; M, online motivation; SC, self-control; SL, self-learning.

(F) Comparison of nodal strength by gender and grade levels

|  |  |  |  |
| --- | --- | --- | --- |
| Nodes | Total | Gender | Grade levels |
| Male | Female | Change | Lower grade | Higher grade | Change |
| CS | -0.038 | 0.588 | -0.057 | -0.645 | 0.164 | 0.156 | -0.008 |
| IS | -0.221 | -0.565 | -0.745 | -0.181 | -0.537 | -0.648 | -0.111 |
| OC | -0.272 | -0.689 | 0.173 | 0.862 | -0.086 | -0.383 | -0.297 |
| M | -1.034 | -1.107 | -0.813 | 0.294 | -1.055 | -0.896 | 0.159 |
| SC | 1.919 | 1.616 | 1.885 | 0.270 | 1.857 | 1.895 | 0.038 |
| SL | -0.354 | 0.157 | -0.444 | -0.601 | -0.342 | -0.123 | 0.219 |

CS, computer skills; IS, internet skills; OC, online communication; M, online motivation; SC, self-control; SL, self-learning.

(G) Global connectivity of the estimated network structures

|  |  |  |
| --- | --- | --- |
| Testing | Sexes | Groups |
| Male (n=451) | Female (n=926) | P-valuea) | Lower-grade (n=652) | Higher-grade (n=725) | P-value |
| Density | 0.667 | 0.867 | 0.033 | 0.867 | 0.80 | 0.516 |
| Global strength | 2.645 | 2.65 | 0.867 | 2.65 | 2.646 | 0.938 |
| Average clustering coefficient | 0.50 | 0.90 | 0.014 | 0.900 | 0.844 | 0.760 |
| Modularity quality index (Q) | 0.385 | 0.297 | 0.024 | 0.306 | 0.360 | 0.094 |
| Average shortest path length | 1.333 | 1.133 | 0.025 | 1.133 | 1.200 | 0.773 |

a)Calculated by the permutation test (global strength from network comparison test and others from NetworkToolbox).