**Appendix A.**

**Sample vs. CPS Demographics (Pilot Test)**

|  |  |  |
| --- | --- | --- |
| Indicator  | Percent of sample (N=243) | Percent of 8th grade pop 2010-2011a (N=28,303) |
| *Gender* |  |  |
|  Female | 52% | 51%b |
| *Race/ethnicity*  |  |  |
|  African American | 41% | 44% |
|  Latinx | 57% | 43% |
|  White | 1% | 8% |
|  Asian | 1% | 3% |
| *SES* |  |  |
|  Eligible for free or reduced lunchc | 95% | 86% |
| *Other Characteristics* |  |  |
|  Has Individualized Education Program (IEP) for disability | 13% | 15% |
|  Designated ELL | 9% | 7% |

aIncludes rising and graduating 8th graders. For space considerations, I list CPS 8th grade demographics in 2010-2011; these are similar for 7th graders ([Chicago Public Schools, 2019](#_ENREF_18)).

bGender based on CPS data reported to Illinois State Board of Education for entire district ([Illinois State Board of Education, 2011](#_ENREF_40)).

cStudents who live in households at or below 130% of the federal poverty level or are “categorically” eligible (i.e., participate in SNAP, TANF, FDPIR, Head Start; are foster, migrant, homeless, runaway) can receive free lunch. Students who live in households between 130-185% of the federal poverty level are eligible for reduced-price meals. In 2010-2011 the poverty level was $18,310 for a three-person household (Food Action and Research Center, 2019; U.S. Department of Health & Human Services, 2010).

**Appendix B.**

**Pilot Model (N=243)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | First-order factor loading on DAa b | Item loadings on first order factor | Item loading on “positive” latent variable |
| **Design Logic** | .79(.115)\*\*\* | - |  |
| When I am learning a new technology, I don't think about what it was designed to do. |  | .40(.104)\*\*\* |  |
| I think about what a technology was designed to do when I am learning how to use it. |  | .87(.196)\*\*\* | .57(.232)\* |
| When I am learning a new technology, I compare what I want to do with what the technology was designed to do. |  | .69(.145)\*\*\* | .42(.175)\* |
| When I'm learning a new technology, I don’t look for things in certain places.c |  | .24(.112)\*  |  |
| **Efficiencies** | . 82(.077)\*\*\* | - |  |
| I try to figure out faster ways of using technology (for example: using short-cuts, keyboard commands, right click menus, etc.). |  | .94(.295)\*\*\* | .63(.203)\*\* |
| I do not try to find faster ways of using technology.d |  | .59(.072)\*\*\* |  |
| I do not spend time learning faster ways of using technology. |  | .48(.190)\*\*\* |  |
| Learning tricks to be faster using technology is important to me. |  | .99(.095)\*\*\* | .60(.201)\*\* |
| **Troubleshootinge** | . 95(.047)\*\*\* | - |  |
| When I have a problem using technology, I try to think of different ways to try to fix the problem. |  | .87(.295)\*\* | .82(.246)\*\*\* |
| When dealing with technology problems, I usually get stuck and don't know what to do.  |  | .47(.095)\*\*\* |  |
| When I have a problem using technology, I don't have any tricks to figure out how to fix the problem. |  | .53(.072)\*\*\* |  |
| When I have a problem using technology, I have tricks to figure out how to fix the problem. |  | .87(.190)\*\*\* | .56(.209)\*\* |
| **Willingness to try & fail** | . 71(.089)\*\*\* |  |  |
| I don't like using new technology because I'm afraid I might mess up and not know what to do. |  | .76(.062)\*\*\* |  |
| I am willing to learn new technology even if I fail. |  | .50(.134)\*\*\* | .25(.164) |
| I usually can't figure out how to use new technologies, so I don't like learning how to use them. |  | .74(.055)\*\*\* |  |
| I don't worry about whether or not I mess up when learning new technology. c |  | .37(.127)\*\*  | .38(.134)\*\* |
| **Management of frustration & boredom** | . 81(.065)\*\*\* | - |  |
| If I feel frustrated when I'm learning how to use technology, I give up or let others do it for me. |  | .65(.072)\*\*\* |  |
| Even if I get frustrated using technology, I never give up. |  | .93(.198)\*\*\* | .70(.183)\*\*\* |
| Even if learning how to use technology is boring, I never give up. |  | .75(.178)\*\*\* | .62(.177)\*\*\* |
| When I’m learning how to use technology, I am easily distracted by other things.d |  | .51(.074)\*\*\* |  |
| **Metacognitione** | . 91(.098)\*\*\* | - |  |
| I try to think through how to do a technology task before I start to do it. |  | .77(.183)\*\*\* | .64(.182)\*\*\* |
| I don’t think through how to do a technology task before I start to do it. |  | .41(.098)\*\*\* |  |
| When I am learning how to use new technology, I try to connect it to other technology I have used. f |  | .82(.259)\*\* | .60(.273)\* |
| I don't talk to others about how well I can use technology.c |  | .21(.097)\* |  |
| **Use of models** | . 79(.097)\*\*\* | - |  |
| I don’t always know how to find help if I have problems using technology. |  | .59(.084)\*\*\* |  |
| I always know how to find help if I have problems using technology. |  | .80(.171)\*\*\* | .48(.170)\*\* |
| When I can’t understand something about technology, I ask more knowledgeable people how to do it. d |  | .431(.181)\* | .51(.171)\*\* |
| If I've finished a technology project but it didn't turn out as well as more tech-savvy students, I don't usually want to revise it. d |  | .462(.095)\*\*\* |  |

aFit indices for the model are: RMSEA=.044, SRMR=.065, TLI=.842, CFI=.818; two of four indicate sufficient fit.

bLoadings are standardized. Standard errors in parentheses. Significance levels are \*p<.05, \*\*p<.01, \*\*\*p<.001.

cItems taken out in the full test; initially retained for further investigation.

dIn full test items did not load over .4; were later removed.

eExpert panelists noted that while related to technology use, these items did not measure learning process.

fIn full test item loaded on “Use of Models” and was moved.

**Appendix C.**

**Geographic Representation in Chicago Study (Full Test)**

