

Work in progress

For educational practice, this paper presents a PLICT test for educational practitioners that wish to assess the ICT skills students need to learn in a personalized way using ICT. The PLICT test is a novel contribution of this study. To our knowledge, this type of test is the first of its kind. However, we used nine schools for this study and did not take into account their differences before the study. While this underlines the practical applicability of our PLICT test, we leave to determination if our test is more accurate for specific types of schools or grades for future research. Also, testing in 'real-life' introduces noise that hinders learning quality, such as mind wandering, misbehavior, poor memory retention, lack of concentration, demotivation, disinterest, and fatigue (Seghier et al., 2019). This noise is generally not found (or reduced to an absolute minimum) in experimental lab-based retention testing. It is possible that the real life classroom context had a negative effect on understanding or completing the PLICT test. To counteract this effect, we prepared the PLICT test (through 3 rounds of cognitive validation and a usability study) and the student (supplied an introductory video, 5 training exercises and voice-overs). The upside to this approach is that we can test if our approach as a whole is viable in educational practice, rather than controlled conditions (Skuballa et al., 2019). Finally, the PLICT test was presented in the Dutch language at Dutch elementary schools. While we assume that an English version would not perform differently because of the uniform definitions of digital literacy, we do advise future researchers to modify the English translations of our test items to their participants and re-check cognitive validity. Should future researchers develop a Personalized Learning with ICT (PLICT) test for a different population (such as higher education) it stands to reason other conditions could be integrated in the PLICT. The locus of control (1) may shift more towards the learner, requiring the skill to manage control; student engagement (3) may develop as their aspirations, purpose and motivations take shape; and students may also be expected to carry more responsibility for the classroom culture (6). This now fell outside the scope of our study.

For educational theory, this paper provides a thorough insight into the development, validation and reliability of our PLICT test. We addressed the uncertainty of test development by basing our test on a thorough conceptual framework. Our analysis consisted of multiple rounds of cognitive validity testing, an internal consistency check, fitting 6 different models and reporting outcomes in the most conservative method by calculating coefficient McDonald's omega and accepting results above 60% explained variance. This allowed us to overcome the problems surrounding assuming tau-equivalency (Dunn et al., 2014). However, the conclusions regarding the reliability of our conceptual 5 factor model are reason for discussion. A 5-factor model can be more informative compared to a 3-factor model. Adding more items to the two factors 'reaching a wider audience' and 'real-time communication' of the 5-factor model could give us more detailed information on the student development of the personalized learning related ICT skills. Developing additional test items for these two factors may be an exciting field for future research. Also, our analysis can be improved in future research by adding a test-retest Alpha or Coefficient of Equivalence and Stability after a second run of our PLICT test. This will give the researcher a greater insight into the long-term stability of the test