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## Computers & Education

Volume 57, Issue 1, August 2011, Pages 1184-1193

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# Modeling primary school pre-service teachers' Technological Pedagogical Content Knowledge (TPACK) for meaningful learning with information and communication technology (ICT)

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<https://doi.org/10.1016/j.compedu.2011.01.007>

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### Abstract

Within the field of educational technology, Technological Pedagogical Content Knowledge (TPACK) has been theorized as a seven-factor construct to describe teacher's integration of information and communication technology (ICT) in their teaching. However, this framework has yet to be successfully validated through survey instruments. This paper examines the construct validity of a TPACK survey that was contextualized for the pedagogical approaches employed in a 12-week ICT course designed with reference to the TPACK framework for Singaporean primary school pre-service teachers. Using this framework, the researchers were able to uncover five of the

seven TPACK constructs which were a better model fit as compared with several extant studies of TPACK surveys. Using these results, pre and post-course structural equation models were constructed to explain the relationships amongst the different constructs of teachers'™ TPACK perceptions. It was found that pedagogical knowledge had a direct impact on TPACK at the beginning of the course. As teachers made connections between their technological knowledge and pedagogical knowledge to form technological pedagogical knowledge during the course, the direct relation between pedagogical knowledge and TPACK became insignificant where as the relations between pedagogical knowledge and technological pedagogical knowledge, and technological pedagogical knowledge and TPACK were strengthened. The comparison between the pre and post-course models also revealed that the pre-service teachers'™ perceived relations between content knowledge and TPACK changes from insignificant to significant. The implications of these findings and suggestions to improve the construct validation of the TPACK framework are discussed in this paper.



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## Keywords

Adult learning; Improving classroom teaching; Pedagogical issues; Teaching/learning strategies

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