



## Teacher Knowledge for Teaching Science Digitally

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### ABSTRACT

The migration to digital teaching and learning platforms has been a game changer calling for the refinement of traditional teacher knowledge theoretical frameworks commonly used in teacher education. This paper presents findings from a study that explored the effectiveness of two differently structured interventions for developing teacher knowledge for teaching science using a newly refined theoretical construct termed digital-Topic Specific Pedagogical Content Knowledge (digital-TSPCK). Digital-TSPCK is a theoretical construct that assist teachers to utilize the complex interactions between discipline specific pedagogies, transformational education technologies, and the ways in which learners respond to multimedia learning when designing and delivering lessons over digital teaching platforms. The purpose of this study was to determine optimal ways to assist pre-service teachers (PSTs) acquire digital-TSPCK in a given topic. The study was a longitudinal study employing a qualitative research design with a cohort of Chemistry PSTs as a case study over 2 years. Primary data were post-intervention PSTs' selfbuilt teaching videos in chemical equilibrium collected in each year as well as PSTs reflections. The analysis followed an in-depth qualitative analysis for digital-TSPCK episodes. Content analysis was used to analyse the reflections for triangulation. Findings reveal differentiated scale of effectiveness across the two intervention approaches. Implications for learning to teach digitized and transformed content in teacher education programmes are made.

**Keywords:** Digital teacher knowledge, intervention, teacher education