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**Title:** Student perception of Structural Engineering knowledge building through a technology-enhanced teaching approach

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**Abstract:** With increasingly under-prepared students enrolling in higher education, and industry complaints regarding graduate inabilities to ‘apply knowledge’, engineering educators are challenged to bridge the divide between theory and practice so as to enable cumulative learning: the ability to move between concepts and contexts. The literature abounds with reports of poor conceptual grasp of fundamental Physics concepts in STEM-based professional programmes. One such Structural Engineering concept is that of three-dimensional building behaviour and design. A research project in the SU Civil Engineering department saw the development of teaching aids to enhance student understanding of the concept. While technology-enhanced educational approaches have become increasingly popular, their efficacy varies. This paper focuses on student perceptions of which tools/technologies best enabled Structural Engineering knowledge building. Using the Legitimation Code Theory (LCT) analytical tool of Semantic Gravity, student survey responses were analysed to determine the influence of different techniques on cumulative learning. Findings demonstrate that there was a scatter of results in terms of which teaching or learning technique assisted each student the most. This highlights that a variety of teachings aids may be required to develop understanding of complex knowledge areas. LCT, a core part of a broad social realist ‘coalition’ of approaches, is emerging as a significant explanatory framework for the empirical analysis of knowledge practices across the disciplinary map. This research seeks to make a contribution both to refining our understanding of student conceptual learning as well as to the development of a more nuanced perspective on technology-based teaching aids in professional education.

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