# Distinguishing Forms of Teacher Knowledge: The Case of Geometry

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Ways to develop mathematics teacher knowledge is fundamental to mathematics teacher education and professional development. Over thirty year ago, Shulman (1987) proposed seven categories of knowledge that constitute the knowledge base for teaching, two of which are particularly relevant to mathematics teacher education and professional development - content knowledge (CK), and pedagogical content knowledge (PCK). Here, CK refers to knowledge of the definitions, concepts, and procedures within mathematics, while PCK refers to knowledge of how to represent content to students while taking into account their prior knowledge and difficulties.

In using this categorisation to inform mathematics teacher education and professional development, it can be that CK is taken to be the knowledge on which PCK is based and built. However, there is evidence that PCK shapes CK or may be primary in some cases, and other evidence of a unidimensional structure for mathematical knowledge for teaching.

In this paper, we focus on research that has examined what teachers need to know in order to teach geometry. In particular, we focus on the extent to which research on CK and PCK for geometry teaching is able to distinguish between geometry CK and geometry PCK. We do this by analysing two papers, one on CK for geometry teaching and the other on PCK for geometry teaching.

Our analysis of the two studies indicates that it is not straightforward to distinguish CK and PCK for geometry teaching. The implication is that it is not straightforward to design teacher education and professional development for teachers of geometry.