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Teacher Cognition: A Model of How Teachers Build Distributed and Enactive Narratives, to Generate and Finetune Mechanism Concepts in Student Minds

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Abstract

Science teaching is a complex socio-cognitive practice, where teachers simultaneously collaborate with and influence student minds. This process is distributed across textbooks, explanations, blackboard activities, student questions, student performance, etc.; and enactive, as teachers act out scientific mechanisms using descriptions, gestures, teaching props, models etc. This complex process of Teacher Cognition (TC) is not well understood, as existing studies are disparate, and based on disjointed approaches. The lack of a TC theory limits the design of systematic education policies - currently based on intuitions about teacher cognition - leading to policy guidelines that teachers find difficult to implement. Recent developments in embodied/enactive cognition theory – particularly the enactive simulation model of language and the enactive simulation theory of other minds – provide useful ways to develop models of TC, especially related to science teaching. Here we extend and develop a finer-grained version of a recent enactive model of TC, using classroom data.