A Framework for Calculus Instruction

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Based on design research, the approximation framework for the instruction of Calculus is meant to i) reflect the structure of formal limit definitions, ii) be based on natural language and ideas directly accessible to students, iii) be coherent in its application to all limit concepts, iv) have coherent meaning and structure across multiple representations, and v) be amenable to instructional techniques based on a constructivist theory of abstraction. Last semester I presented a talk that focused on how the approximation framework was central to student progress as they engaged cognitive challenges in coming to more formal understandings of limits. In this talk, I will reveal more of the application of the approximation framework as it might appear in a classroom. In dong so, you will see how the framework leverages students' notions of approximations, errors, and bounds on errors by using multiple representations within and across various limits contexts to meet the design goals.