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Characterizing Pedagogical Practices of University Physics Students in Informal Learning Environments
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University educators (UEs) have a long history of teaching physics not only in formal classroom settings but also in informal outreach environments. The pedagogical practices of UEs in informal physics teaching have not been widely studied, and they may provide insight into formal practices and preparation. We investigate the interactions between UEs and children in an afterschool physics program facilitated by university physics students from the University of Colorado Boulder. In this program, physics undergraduates, graduate students and post-doctoral researchers work with K-8 children on hands-on physics activities on a weekly basis over the course of a semester. We use an Activity Theoretic framework as a tool to examine situational aspects of individuals' behavior in the complex structure of the afterschool program. Using this framework, we analyze video of UE-child interactions and identify three main pedagogical modalities that UEs display during activities: Instruction, Consultation and Participation modes. These modes are characterized by certain language, physical location, and objectives that establish differences in UE-child roles and division of labor. Based on this analysis, we discuss implications for promoting pedagogical strategies through purposeful curriculum development and university educator preparation.