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# Test Before Study: Maximizing Adaptive Learning Gains using Prior Knowledge Assessment

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## Abstract

Digital adaptive fact learning systems tailor learning sessions to the individual learner. Most adaptive learning systems assume that the learner has no prior knowledge of the material and therefore use an initial ‘passive rehearsal’ trial for all facts. Here, we test a system that uses active retrieval trials instead of passive study trials when introducing items. This minimizes time loss associated with studying familiar materials and maximizes potential benefits of attempted retrieval before study. We test the system by having participants learn the association between the outlines and names of countries, a domain in which they are likely to have varying degrees of prior knowledge. We show that using attempted retrieval to identify known items is valuable in real-world applications, where partial knowledge of study materials before the start of a learning session is very common.