

# RiPLE: Recommendation in Peer-Learning Environments Based on Knowledge Gaps and Interests

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## ABSTRACT

Various forms of Peer-Learning Environments are increasingly being used in post-secondary education, often to help build repositories of student generated learning objects. However, large classes can result in an extensive repository, which can make it more challenging for students to search for suitable objects that both reflect their interests and address their knowledge gaps. Recommender Systems for Technology Enhanced Learning (RecSysTEL) offer a potential solution to this problem by providing sophisticated filtering techniques to help students to find the resources that they need in a timely manner. Here, a new RecSysTEL for Recommendation in Peer-Learning Environments (RiPLE) is presented. The approach uses a collaborative filtering algorithm based upon matrix factorization to create personalized recommendations for individual students that address their interests and their current knowledge gaps. The approach is validated using both synthetic and real data sets. The results are promising, indicating RiPLE is able to provide sensible personalized recommendations for both regular and cold-start users under reasonable assumptions about parameters and user behavior.

## Keywords

Peer-Learning Environments, Recommender Systems, Knowledge Gaps