
Standing on the Shoulders of Peers: Tournament-Style Remixing in Project Courses

Julia Cambre

UC San Diego Design Lab
Atkinson Hall 1601
La Jolla, CA 92093
jcambre@ucsd.edu

Scott Klemmer

UC San Diego Design Lab
Atkinson Hall 1601
La Jolla, CA 92093
srk@ucsd.edu

Abstract

All design is redesign: many real-world projects directly build on others' work. By contrast, course projects usually demand the opposite: learners must use their own work from start to finish. Drawing inspiration from peer production communities, we introduce tournament-style remixing into project-based assignments. Remixing reduces learners' path dependence, enabling them to diverge from their work on early assignments. Remixing also gives learners an up-close look at other approaches to the same project. Finally, remixing provides the opportunity to practice the real-world skill of elaborating upon the work of others. We present an early pilot of remixing in a design course project and discuss implications for learning.

Author Keywords

Peer learning; remixing; peer production.

ACM Classification Keywords

K.3.1 Computer Uses in Education: Collaborative learning

Introduction

Peer production communities such as Wikipedia, GitHub, and Scratch provide powerful opportunities for

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

Copyright is held by the author/owner(s).

CSCW '17 Companion, February 25–March 1, 2017, Portland, OR, USA.

ACM ISBN 978-1-4503-4676-4/17/02.

<http://dx.doi.org/10.1145/3022198.3026353>

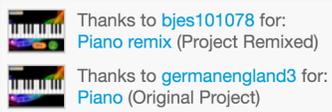


Figure 1: The Scratch interface displays a trace of remixes.

informal learning (Figure 1) by allowing contributors to build upon the work of others [1, 2]. Such self-directed work can be highly motivating and meaningful, but suffers from a lack of consistent, learning-oriented feedback [7]. By contrast, projects in formal educational contexts provide learners with clear guidelines of what to produce. Each individual or team creates an original submission, receives feedback, and typically uses that same submission and feedback as the basis for the next milestone. To build off someone else's work is often considered plagiarism.

This work-in-progress combines the structure and cadence of course projects with the open, collaborative spirit of peer production communities by introducing tournament-style remixing in course projects. Here, "remixing" means completing an assignment with another learner's prior project work as the basis. Remixing is optional: when learners submit an assignment, they have the option to allow peers to remix their work. Remixed submissions are voted upon by peers, and the top submissions become seeds for learners to remix in the following assignment.

In project courses, learners who make poor choices early on can be locked into a bad path because the switching cost of pursuing a better alternative is too high. Economists use the term path dependence to describe how downstream opportunities are constrained by prior choices. Remixing breaks path dependence in course projects. We hypothesize three ways that breaking path dependence with remixing improves learning:

First, remixing may foster a studio-like environment by allowing learners to generate and compare multiple

alternatives. In contrast to collaborative team projects, remixing affords each learner the opportunity to independently create their own work. Prior studies in massive online courses found that learners cited seeing others' work as the most valuable aspect of the peer evaluation process [3]. Because remixed submissions share a common basis, they may be more similar than submissions generated independently. This similarity might amplify the benefits of seeing peers' work by encouraging comparison and helping learners recognize the diverse range of possible elaborations.

H1: *Both remixing others' work and viewing alternative remixes of the same seed submission increases abductive thinking: the ability to see and enumerate a broad space of possibilities.*

Second, requiring learners to build on their own prior work introduces a form of double jeopardy because weak performance on early assignments carries forward. Remixing allows learners to more quickly recover and start new milestones on equal footing with peers. Sharing, voting, and remixing offer additional ways for peers to connect with each other, which may improve course performance and persistence. These connections can be especially valuable for online classes, which run the risk that learners are 'alone together' [8].

H2: *Learners who remix are less likely to drop out than those who continue their own work.*

Third, tournaments give extra visibility to high-quality work. We think this will provide extra motivation for some learners. We also want to take note of whether celebrating excellent work demotivates others [6]. In

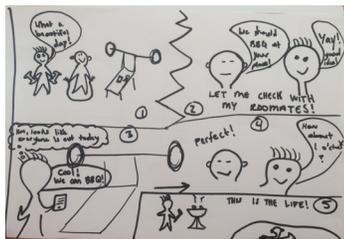
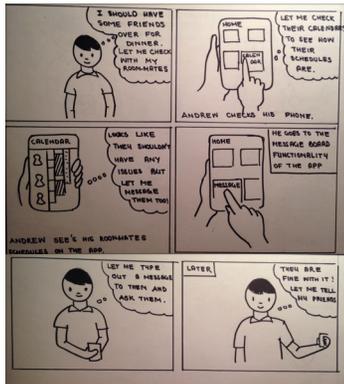


Figure 2: Two examples of storyboards created by different learners. Both storyboards remix a need submitted by a peer: “Resident needs to be able to communicate when they need certain resources, e.g. ‘I’m having friends over for dinner, please can I use the living room’”

terms of content, tournaments also offer an evolutionary benefit of being able to explore and select the most successful alternative submission. However, this evolutionary diversity is absent when a single learner or team carries a project from start to finish.

H3: *The ultimate outcome of remixed submissions is higher quality than individually produced submissions.*

Pilot Study

To investigate the efficacy of remixing in course projects, we conducted a pilot study in an online design course. Assignments 3 to 9 gave learners the option to use a peer’s exemplary submission to the prior assignment as the basis of their work, or to continue working on their own prior submission. The initial seed project was chosen by the authors and shared with the creator’s permission. When submitting assignments, learners indicated whether they would be willing to share their work under a Creative Commons license. Learners who remixed were also asked to provide attribution to their peers. After the submission deadline for each assignment passed, we distributed a Qualtrics survey to the 510 learners enrolled in the current session to vote on the best remixed submission. To incentivize participation in remixing, learners received a certificate at the end of the course if their submission was selected as the best remix for a project milestone.

In this pilot, 8 learners submitted 35 remixed submissions across the 7 assignments. Figure 3 shows the submission network. Of the 618 total submissions, 54.7% were shared under a Creative Commons license.

The initial round of remixing yielded submissions with similar ideas (Figure 2). By the fourth round, submis-

sions began to diverge in emphasis (Figure 4). Future studies will measure originality and content quality more systematically through expert and peer ratings.

Voting participation was minimal; the voting surveys received between 4 and 7 votes. Two voting rounds resulted in a tie, in which case both submissions were featured. Winning submissions were authored by 4 distinct learners (Figure 3), and one learner’s work was selected as the winning submission on 5 milestones. To reduce effort and scale learner-curated review, we are combining peer feedback and voting into a single step through ordinal peer evaluation [5]. This pilot used

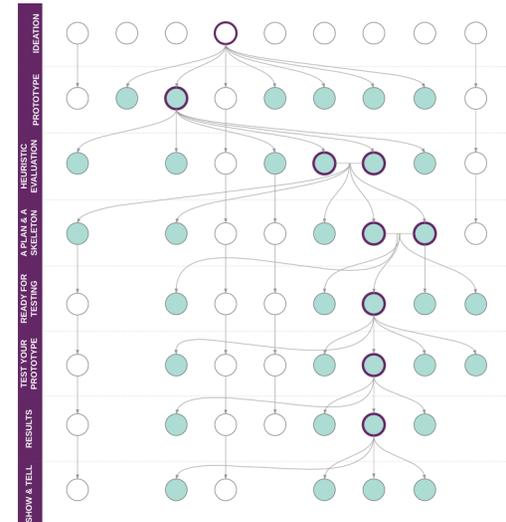


Figure 3: Network of remix submissions across 8 project milestones in an online design course. Each column represents a learner’s submissions. Teal circles represent remixed submissions. White circles represent non-remixed submissions, or submissions in which learners provided no attribution to peers. Circles with a heavy purple outline indicate winning submissions which served as the seed for the next assignment.

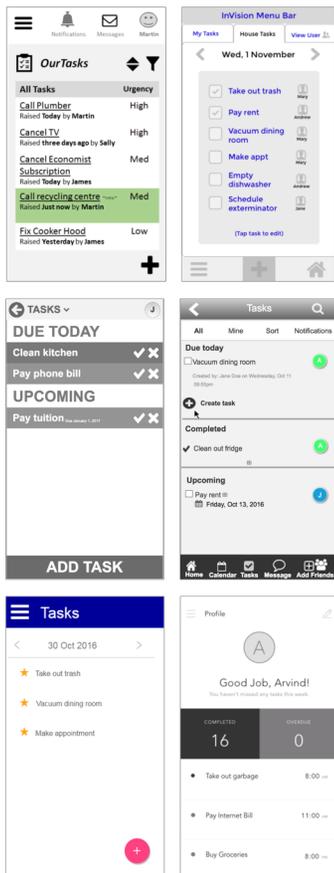


Figure 4: Task tracking dashboards from the fourth assignment in which remixing was permitted. While these prototypes all center around group task tracking, implementations vary in completeness and focus.

submission quality as the heuristic for selecting seeds for remixing. However, showcasing the top submission may reduce remix activity if the submission is perceived as too polished. Future studies will investigate alternative methods to select seed submissions that are generative in nature.

Plagiarism, Attribution, and Originality

One perennial concern with student work, especially in online education, is plagiarism. In peer assessed projects, learners can plagiarize creative work by reviewing others' work and submitting something similar as their own. Remixing magnifies two concerns related to plagiarism. First, explicitly encouraging learners to build upon peers' work may increase the prevalence of uncredited borrowing, in which learners fail to provide proper attribution to antecedent work. Second, learners may submit a properly credited remix, but with such trivial modifications that the submission should not be considered an original elaboration.

Identifying and evaluating submission originality remains an open question for future work. Prior systems involving remixing have relied upon computational measures such as edit distance for plagiarism detection [4]. To amplify and extend plagiarism detection to submission types that are not as amenable to machine grading, we plan to assess attribution and originality by incorporating comparison between source and remixed submissions as a component of the peer evaluation process.

Scaling Up

Currently, we are scaling the pilot to a larger deployment and study which investigates our hypotheses in

additional domains such as creative writing, business, and computer science.

Acknowledgements

We thank SAP & Google for helping support this work.

References

- 1 Dasgupta, S. et al., Remixing as a Pathway to Computational Thinking. In *Proc. CSCW* (2016).
- 2 Forte, A., & Bruckman, A. From Wikipedia to the classroom: exploring online publication and learning. *Proc. Int. Conference of Learning Sciences* (2006).
- 3 Kulkarni, C. et al., Peer and self assessment in massive online classes. *ACM TOCHI*. 20, 6 (2013).
- 4 Hill, B.M. and Monroy-Hernández, A. The Remixing Dilemma: The Trade-off Between Generativity and Originality. *American Behavioral Scientist* 57, 5 (2013), 643-663.
- 5 Raman, K., & Joachims, T. Bayesian Ordinal Peer Grading. In *Learning at Scale* (2015).
- 6 Rogers, Todd, & Feller, T. 2016. Discouraged by Peer Excellence: Exposure to Exemplary Peer Performance Causes Quitting. *Psychological Science* 27 (3): 365–74.
- 7 Tsay, J. et al., Influence of Social and Technical Factors for Evaluating Contribution in GitHub. In *Proc. ICSE* (2014).
- 8 Turkle, S. *Alone Together: Why We Expect More from Technology and Less from Each Other*. Basic Books, Inc., (2011).