Improved Personalization in MOOCs to Enhance Student Learning

Berkeley SCHOOL OF INFORMATION

MIMS Final Project 2018

Team members: Sana Iqbal, Suchismita Padhy, Priyanka Patki, Nianthrini Vivekanandan

Advisor: Dr. Zachary Pardos

What is MOOCs?

Massive Open Online Courses (MOOCs) provide an economical and flexible way to learn new skills and to deliver quality educational experiences at scale. Some benefits of MOOCs include:

- Access to world class education
- Learn anywhere, anytime at your own convenience
- Cost effective
- Flexibility to complete courses at your own pace

What are the problems in MOOCs?

Lack of Feedback
In comparison to traditional education system, there is no feedback. This results in a knowledge gap when students try to apply concepts.

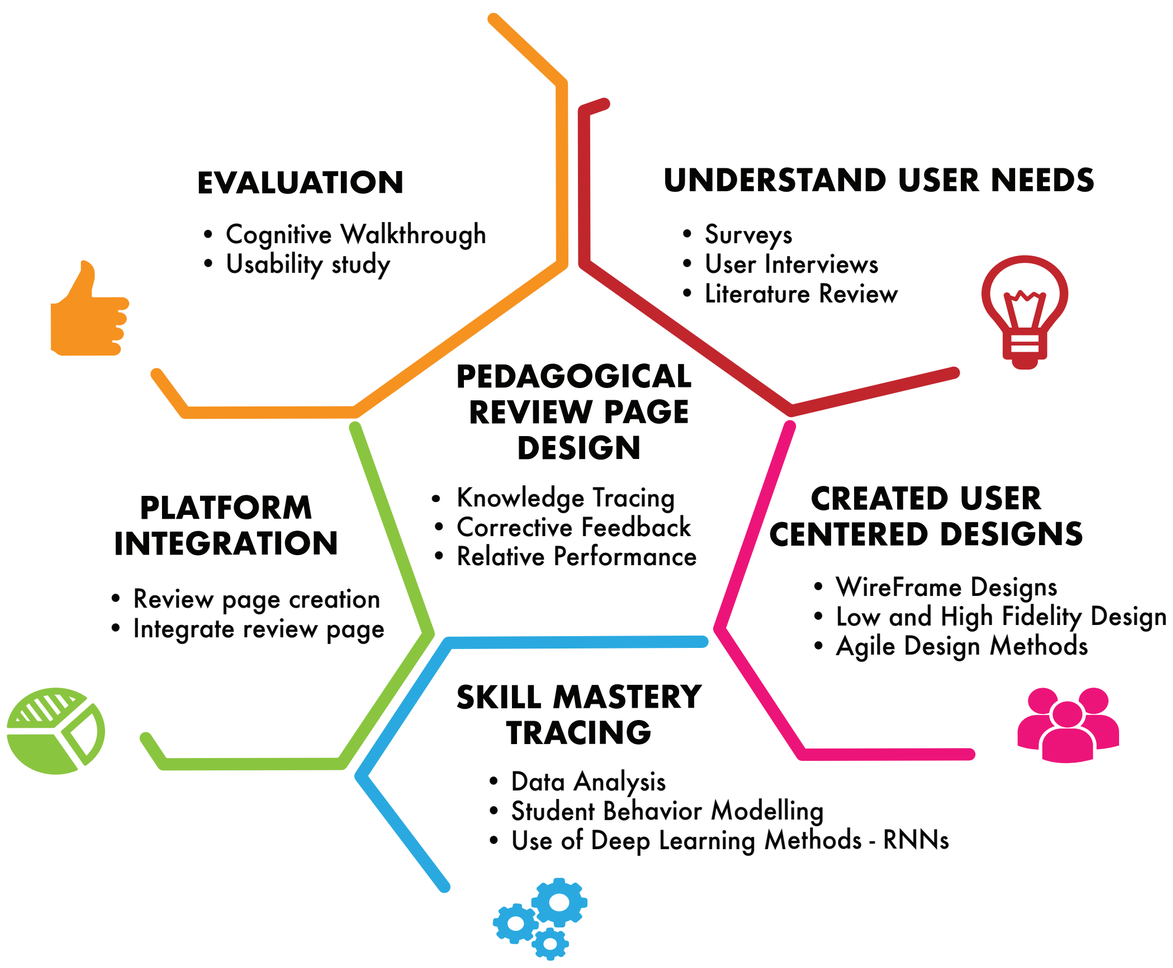
Absence of Pedagogical Guidance
When a student is struggling with a concept, he has no idea on how to proceed with the course.

Students with Different Motivations
Not all students take MOOCs to complete the course, some only want to learn specific topics of interest.

Lack of Community /Peer Learning
Many students are peer-driven where colloborative learning and the pressure to excel helps a student to perform better.

→ **High Dropouts**

Process Map



Solution

A personalized review page generated at the end of each section, after every quiz, is one way to inform the user about knowledge gaps and possible actions to remediate the gaps.

User Experience Research and Design

- To Understand User Behavior and Problems
- Iterative Design - Review Page

Machine Learning

- Phase 1: Deep Knowledge Tracing(DKT)
- Phase 2: DKT + Behavior Analysis

→ Personalized Corrective Feedback

Product Infrastructure

- Full stack development of review page.
- Integration with edX Platform

Features

Suggested Review Links

To decrease knowledge gap

Skill Progress Bar

Setting skill expectations

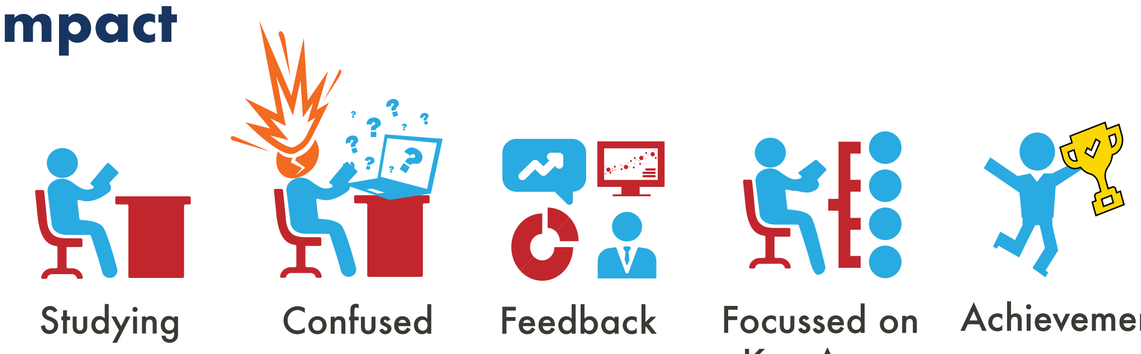
Skill Mastery Score

Measuring skill levels

Course Progress Bar

Tracking course progress

Impact



Our Main Contributions:

The experiment with DKT has shown a moderate increase in accuracy over naive baseline method. Therefore, we believe our work has set a stage for further exploration to improve accuracies by increasing model complexity and also investigating the motivational effect of "psychological framing" on student. We have laid down a detailed user study on the need to provide personalized learning environment MOOCs users.

References: Noun Projects, Freepik.com