

Mastery Learning

In materials taught with mastery learning, you don't move on to future materials until you've mastered a concept, so you do not try to learn information without prerequisite knowledge. A famous result by Bloom (http://en.wikipedia.org/wiki/Bloom's_2_Sigma_Problem) showed that typical tutored students will outperform 95% of students in a traditional classroom. About half of this benefit comes from mastery learning. If a student phases out for a moment in lecture, they might miss a critical concept, and misunderstand the rest of the lecture. In contrast, a tutor will stop on a concept until the student masters it.

Aside from learning science, support for many of the techniques used to typically implement mastery learning are found in a number of disciplines:

- Self-regulated learning. Many forms of one include the other.
- Gamification (<http://www.penny-arcade.com/patv/episode/gamifying-education>). In mastery learning, students are generally rewarded for progress, rather than seriously punished for errors (e.g. you try again, rather than permanently losing a letter grade). This matches what we know about motivation.
- Mindset and attitude. Traditional classroom grading severely punishes intellectual risktaking, since penalties for errors are severe and permanent.
- Rapid feedback and formative assessment. Mastery learning generally requires providing students or instructors with means to immediately monitor student learning.

Complex problems with infinite attempts are one way to help promote mastery learning. The ability to stop, pause, and review videos is another. Think of other things we could do around either student or instructor experience to promote mastery learning? If you think we've done everything, think about more complex disciplines (where edX traditionally has used multiple choice questions, or asynchronous grading).