Tech Snacks: Intro to Mastery-Based Learning

Do you struggle to keep students on pace with your course and with each other? Do you worry about students who seem to get further and further behind as the semester moves along? A mastery learning model can help you address individual learning needs in a group-based classroom, reducing skills gaps and boosting student confidence.
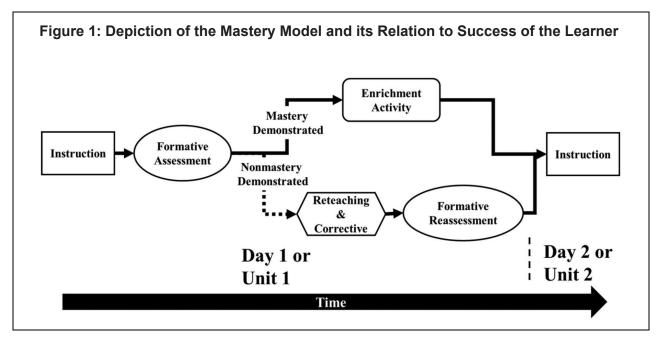
What is Mastery-Based Learning?

Mastery-based learning requires students to demonstrate a certain threshold of competence with a task or concept before moving on. According to "A Practical Review of Mastery Learning" (Winget & Persky, 2022):

> *Mastery learning's goal is for all or nearly all students to "master" or become competent in the course material. For the system to be successful, the instructor must **clearly define the learning outcomes and what constitutes mastery** for students.*
>
> *Each topic or grouping of topics (eg, instructional units) organize learning outcomes into one- or two-week intervals (as displayed in Figure 1). Following the initial instructional period, **students complete a formative assessment** based on the established learning outcomes. For students who accomplish the predefined level of mastery, **enrichment activities are offered** to supplement the students' understanding of the material.*
>
> *Conversely, students who do not accomplish the predefined level of mastery are given **corrective exercises specific to the concepts missed** by the student. These students are then given a separate formative assessment, pertaining to the same learning outcomes, and must demonstrate mastery prior to moving to the next unit. That is, students who do not accomplish mastery the first time are **remediated until they demonstrate mastery.**[1]*

Figure 1: Depiction of the Mastery Model and its Relation to Success of the Learner

Winget and Persky point out that mastery learning stresses five key principles:

1. The student is graded [primarily] based on their performance on the (final) summative assessment.
2. The student is assessed on predetermined standards and not relative to peers.
3. Students who attain the standard receive the appropriate grade reward.
4. Throughout learning the student is given a series of [...] diagnostic assessments to promote and pace learning.
5. Each student is given all the help they need to learn.

---

[1]Winget, M., Persky, A. M. (2022, December) A Practical Review of Mastery Learning. *American Journal of Pharmaceutical Education*, *86*(10); DOI: https://doi.org/10.5688/ajpe8906

The Benefits of Implementing Mastery-Based Learning

Generally, With regard to overall achievement, Mastery-based learning has some overall benefits when compared with traditional "fixed-pace" learning (Gentile & Lalley, 2003):[2]

- Students ultimately perform better on criterion-referenced tests (e.g., final exams).
- Students ultimately perform better on standardized tests (slightly but significantly).
- Regarding memory: students undergoing mastery learning tend to score higher on retention tests after several weeks or months.
- Regarding standards: the higher the passing standard, the larger the gains by those undergoing mastery learning.
- Regarding affective outcomes: students taught via mastery learning are more likely to self-report positive attitudes and confidence in their abilities regarding the material taught.
- Regarding effects on teachers: the use of mastery learning in their own classes alters their overall expectations for student achievement and what causes it.
- Regarding memory by fast and slow learners: it is not the rate of attainment but rather the amount initially learned that determines how much is forgotten/retained. Both fast and slow learners forget/retain at the same rate after mastering material at the same level.

Grading in a Mastery-Based Learning Environment

Gonzalez (2021) notes:

> One of the most important elements of building an effective mastery-based grading classroom is **cultivating a culture of revision**. Students need to internalize that to achieve mastery you should EXPECT to revise your work. This is a novel concept to many students and will result in some pushback, which is a good thing.
>
> During this practice time, students should be submitting assignments and receiving feedback from their teacher on areas that need improvement. Unlike a traditional setting, where students turn in assignments and never see them again until they are "graded," in a mastery-based classroom, students are constantly revisiting their assignment until they understand the material enough to demonstrate their mastery.[3]

Correspondingly, gradebooks for an MBL classroom will look different from traditional gradebooks. See Gonzalez' example below:

Traditional Gradebook:

L1 A	L1 MC	L2 A	L2 MC	L3 A	L3 MC	L4 A	L4 MC	L5 A	L5 MC	Test
9/10	1/2	7/10	2/2	6.5/10	1/2	6/10	1/2	5/10	1/2	38/50
90%	50%	70%	100%	65%	100%	60%	50%	50%	50%	76%

Mastery-Based Gradebook:

L1 A	L1 MC	L2 A	L2 MC	L3 A	L3 MC	L4 A	L4 MC	L5 A	L5 MC	Test
10/10	2/2	10/10	2/2	9/10	2/2	10/10	2/2	0/10	0/2	41/50
100%	100%	100%	100%	90%	100%	100%	100%	0%	0%	82%

****Note that Brightspace does not yet have a "mastery grading" feature; however,many instructors have developed ways around this issue. For instance, some will create a quiz with unlimited attempts but let students know that they must achieve an 80% or higher to receive a grade on that quiz. They then enter zeroes manually to override anything lower than an 80%.

[2] Lalley, J. P., Gentile, J. R. (2003). *Standards and Mastery Learning: Aligning Teaching and Assessment So All Children Can Learn*. Corwin.
[3] Farah, K., (2021, March). *How to Set Up Mastery-Based Learning in Your Classroom.* Cult of Pedagogy. https://www.cultofpedagogy.com/mastery-based-grading/