An Introduction to Mastery Based Grading and its Effectiveness in a Remote Instruction Environment
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Why look at our grading policies?

Traditional Grading:

- Students have difficulty knowing how they are doing.
- Students struggle to compute their current or future course grade.
- Giving meaningful advice can be difficult and time-consuming (and students often ignore it)
- Lots of lost information (why DID I give 7 points instead of 6?)
- A student can accumulate a lot of PARTIAL credit without actually mastering the content of the course

In Remote Instruction:

- High stakes assessments increase incentives to cheat.
- Potential distortion of course grades due to awarding lots of points to activities that do not demonstrate mastery of course content.
- Access to books, notes, technology and people leads to having to ask the question “What exactly are we assessing? Math skills? Or Google Skills?”
“Grades should reflect **demonstrated mastery of course content** and have a positive effect on student **learning**.”

—Kate Owens  
College of Charleston

“What you assess is what they learn.”

—Sharona Krinsky  
Cal State Los Angeles
1 What is Mastery Grading?
Mastery Grading is an approach to grading that involves three key features:

1. **A clear list of learning targets, objectives or standards.**
   Students are given access to a list of learning targets and what skills are necessary in order to meet those targets.

2. **Assessment of mastery** instead of points or partial credit.
   Student work is graded based on mastery of the associated learning target(s) using a scale from “no mastery shown” to “full mastery demonstrated”.

3. **Eventual mastery** matters.
   Students are given multiple attempts to demonstrate mastery and are not penalized for failing to demonstrate mastery on earlier attempts. Students are given opportunities to revise, resubmit, and/or retry their work.

Adapted from *Introduction to Mastery Grading*
Mastery Grading Online:

1. Opportunity to “fail forward”
2. Student autonomy
3. Flexible ways of demonstrating mastery
4. Encourages a growth mindset
5. Transparent, detailed learning objectives are usually misaligned with answers available from outside sources.
6. Removes the instructor as the gatekeeper of the points.
Quiz problem - Assessing content

Standard: Introduction to Sequences
I can:
● Find the terms of a sequence defined implicitly or explicitly.

Problem:

Describe the first four terms of the following sequence

\[ a_{n+1} = \begin{cases} 2a_n - 1, & \text{if } a_n \text{ is even} \\ 3a_n + 1, & \text{if } a_n \text{ is odd} \end{cases}, \quad a_1 = 6 \]

Correct Work:

\[ a_1 = 6, a_2 = 2(6) - 1 = 11, a_3 = 3(11) + 1 = 34, a_4 = 2(34) - 1 = 67 \]

Typical incorrect work:

A

- \[ a_2 = 2(6) - 1 = 11 \]
- \[ a_3 = 2(11) - 1 = 21 \]
- \[ a_4 = 2(21) - 1 = 41 \]

B

- \[ a_2 = 3(6) + 1 = 19 \]
- \[ a_3 = 3(19) + 1 = 58 \]
- \[ a_4 = 3(58) + 1 = 175 \]
- \[ a_2 = 2(6) - 1 = 11 \]
- \[ a_3 = 3(11) - 1 = 33 \]
- \[ a_4 = 3(33) + 1 = 100 \]
Example

**Linear Algebra**

- 24 Linear Algebra Standards
- 4 Mathematical Practice Standards
- One P³ “Habits of Mind” Standard

**A** - Master 27 or more standards

**B** - Master 24 or more standards

**C** - Master 21 or more standards
Example

To Master a Linear Algebra or Mathematical Practice Standard

Get a ✔️ on two mastery assessments

Opportunities:

1. Portfolio style “homework” assessment
2. Initial Quiz
3. Requiz #1
4. Requiz #2
5. Final Exam

To Master the P³ Standard

Get 620 or more points (out of at least 800 available).
How has this worked in practice?

**Statistics**
- In use since Fall 2018.
- 3,000+ students
- Spring 2020 - over 400 students taking the course, only 4 identified instances of cheating via “Chegg”

**Calculus**
- In use since Spring 2017.
- 13 courses in the Calculus sequence
- 325+ students
- Pass rate over 80%, most with A’s and B’s
- Students report never having worked harder and have pushed through their learning longer than in other classes
“If you can revise and resubmit just about any significant piece of work - multiple times, and get helpful feedback each time - until you’re happy with your grade, then the value proposition of cheating becomes empty.”

—Robert Talbert
Grand Valley State University
Author of Flipped Learning: A Guide for Higher Education Faculty
Blog: r talbert.org
Mastery Grading Conference
June 2020

Over 500 Math and STEM faculty from around the country (and in some cases the world) attended a 2-day online conference.

www.masterygrading.com

- Two days of recordings of various Zoom Webinars
- Resources page with links
- Pre-conference assignment to get started
Join the Community

- Mastery Grading Slack Channel (link on resources page at www.masterygrading.com)
- Twitter
  #MasteryGrading
  @SouthBaySharona
  @KateOwens
  @dccmath (Dave Clark)
Thanks!

Do you have any questions?

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