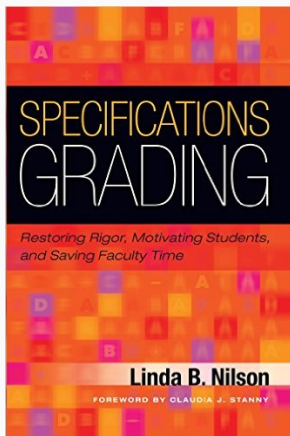


An Overview of Specifications Grading

Mike Janssen
Dordt College
21st ACMS Biennial Conference
Charleston, SC
June 2, 2017

Introduction



The main question

What do you want students to learn, and how will you know when they've learned it?

The main question

What do you want students to learn, and how will you know when they've learned it?

Or:

What are the (explicit) student learning objectives, and what assessments will you use to gauge student progress toward mastering these learning objectives?

Specifications: Assessing the work

Grade your assessments Pass/No Pass according to set *specifications*, allowing sufficient opportunities for revision.

Specifications: Assessing the work

Grade your assessments Pass/No Pass according to set *specifications*, allowing sufficient opportunities for revision.

Example

- If you wish to use a result we have not proved in class or you have not proved on an earlier homework problem, it should be stated as a lemma and proved independently.
- All solutions must be typeset using the free, open-source mathematical typesetting system, \LaTeX .
- Solutions to proofs and problems should be free of errors.

Specifications: Assessing the work

Grade your assessments Pass/No Pass according to set *specifications*, allowing sufficient opportunities for revision.

Example

- If you wish to use a result we have not proved in class or you have not proved on an earlier homework problem, it should be stated as a lemma and proved independently.
- All solutions must be typeset using the free, open-source mathematical typesetting system, \LaTeX .
- Solutions to proofs and problems should be free of errors.

The specifications are designed to encourage *self-regulation*: metacognition, strategic planning, and evaluating personal progress against a standard.

Final grades

- Assign final grades by counting the amount/depth of work completed at a satisfactory level; more hurdles or higher hurdles (or both)?
- Students are encouraged to choose their grade goal and *only do the work they need to do in order to achieve that goal.*

Example course: Abstract Algebra I

Mathematical Content Targets (38)

The mathematical content on which I wanted students to demonstrate competency.

Mathematical Content Targets (38)

The mathematical content on which I wanted students to demonstrate competency.

- **Example:** “R5 – I can determine whether a given subset of a ring is an ideal.”
- **Example:** “G2 – I can verify elementary properties of abstract groups using basic definitions.”

Each content objective assessed twice: once on weekly homework, once on a take-home exam. One free revision on learning targets given good-faith effort.

Feedback and Revisions

- Copious feedback given on initial submissions – where it went wrong, and a nudge in the direction of a correct solution
- Revisions due one week after initial feedback, re-uploaded to LMS
- Students given tokens to use to extend deadlines, get a second (or third) revision, or revise non-GFE work

Final Grades (Simplified)

Grade	Homework (38)	Exams (38)
A	36	27
B	34	21
C	32	17
D	26	14

Example Course: Calculus II

Assessments

- 18 learning targets covering the big ideas
- Learning targets assessed 3–4 times each on 7 mastery exams: multiple opportunities, only need to pass a learning target once, etc.
- In-office oral retakes at a cost

benefit from studying again?

tokens?

Assessments

- 18 learning targets covering the big ideas
- Learning targets assessed 3–4 times each on 7 mastery exams: multiple opportunities, only need to pass a learning target once, etc.
- In-office oral retakes at a cost
- Online homework

benefit from studying again?

tokens?

Assessments

- 18 learning targets covering the big ideas
- Learning targets assessed 3–4 times each on 7 mastery exams: multiple opportunities, only need to pass a learning target once, etc.
- In-office oral retakes at a cost
- Online homework
- Mini-projects

benefit from studying again?

tokens?

Assessments

- 18 learning targets covering the big ideas
- Learning targets assessed 3–4 times each on 7 mastery exams: multiple opportunities, only need to pass a learning target once, etc. *benefit from studying again?*
- In-office oral retakes at a cost *tokens?*
- Online homework
- Mini-projects
- “Engagement credits” earned by completing various tasks (readings, reflections, in-class problem presentations, etc.)

Course grades (simplified)

Grade	EC's	Learning Targets (18)	Mini-Projects (8)	WebAssign (227)
A	40	17	6	216
B	30	15	4	198
C	25	12	2	178
D	15	10	0	158

Student Reactions

- One abstract algebra student did *not* like tying his choices so clearly to his final grade; would have rather been subject to the mystical weighted average

Student Reactions

- One abstract algebra student did *not* like tying his choices so clearly to his final grade; would have rather been subject to the mystical weighted average
- The Integration by Parts Incident

sell! sell! sell!

Student Reactions

- One abstract algebra student did *not* like tying his choices so clearly to his final grade; would have rather been subject to the mystical weighted average
- The Integration by Parts Incident

sell! sell! sell!

End-of-semester student email:

"I felt like I learned the material better than if it was a traditional system. It allowed me to focus on certain aspects at a time for the mastery exams. It also felt more manageable as long as I stayed on top of the homework/projects/studying and didn't let it build up."

Thanks!

mike.janssen@dordt.edu