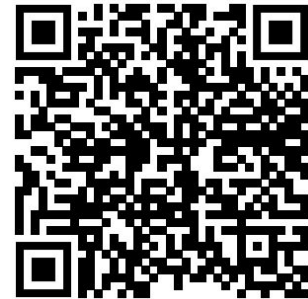


Standards Based Grading

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Outline

- Standards Based Grading vs Points Based Grading
- Why I use standards based grading
- My first try at SBG - Fall 2023 - General Ed Statistics
- How I'm implementing standards based grading now
- How to set my approach up with a LMS
- Resources I used and that you can use to learn more

Standards

vs.

Points

- Standards-based grading (SBG), or mastery-based grading, is a system that evaluates students' progress toward mastering specific learning targets called standards.
 - When a student underperforms, they are concerned with how they can learn/master the learning targets.
 - It's easy to see where student knowledge deficiencies are and to give them resources to help them.
 - By linking learning targets to the course learning objectives, completing assessment reports is easy.
- Traditional points-based grading systems assign point values to exercises. Points are taken off for small careless mistakes as well as content mistakes.
 - Students who underperform don't seem interested in mastering the skills that caused them to do poorly.
 - Without having the assessments in front of me, it's difficult to determine what caused a student to do poorly.
 - Sometimes this grading system feels arbitrary.

Why I decided to use SBG

1. Policies around assessment
2. I began questioning the points-based-grading systems
3. A colleague of mine started using SBG first
4. IMACC 2023 had multiple presentations on the topic
5. I'm far more confident in the grades I am assigning

My first attempt at SBG (1)

- **Learning Targets:** The 7 course learning objectives (CLOs) are the only learning targets.
- **Homework:** A homework assignment was assigned for some preliminary material and one for each CLO. Homework was not used in the final grade calculation.
- **Knowledge Checks:** Each CLO was assessed at least twice during the semester. Each knowledge check assessed the entire CLO on a scale from 0 to 4.

0	1	2 (C level)	3	4
No submission, no evidence	Fail to meet expectations	Partially meets expectations	Meets expectations	Exceeds expectations

General Education Stats Learning Objectives at BHC

- A. Provide and interpret graphical displays of data
- B. Calculate and interpret the sample mean, median, mode, variance, and standard deviation
- C. Calculate and interpret probabilities using sample spaces and probability laws
- D. Calculate and interpret probabilities from probability distributions such as binomial distributions and normal distributions
- E. Construct and interpret confidence intervals for population means and proportions based on sample data
- F. Test and interpret hypotheses of population means and proportions based on sample data
- G. Calculate and interpret regression lines, and use regression lines to make predictions

My first attempt at SBG (2)

- **Final Knowledge Check:** All CLOs were assessed for a third time.
- **Semester Project:** Students submitted a final draft of a semester long project which assessed most CLOs (not the probability laws).
- **Final Grade:** The final score for each CLO was the median of score of the knowledge checks for each CLO category. A final letter grade was assigned based on the number of 4s, 3s, 2s, 1s, and 0s earned for the 7 CLOs.
- **Reassess Knowledge:** A student could reassess a CLO. This did not replace earlier scores, only increased the number of scores in the CLO category. This should be done before the final.



First Attempt Pros and Cons

Pros:

1. Improved confidence in the assigned grades
2. Students were interested in mastering topics, not earning points!
3. Easy to submit my college's required assessment reports

Con:

1. It took way too much time to compute letter grades. If I want to keep using SBG, I needed to come up with a more sustainable approach.

How I Implement Standards Based Grading Now

1. **Course Learning Objectives** are used as the course units.
2. **Learning Targets:** divide each learning objective into several smaller objectives that students must demonstrate to show they have mastered the content.
3. **Equal grade intervals:**
 - a. F = [0,0.2); D = [0.2,0.4); C = [0.4,0.6); B = [0.6,0.8); A = [0.8,1]
4. **Knowledge Checks:**
 - a. usually given as tests or quizzes and assess one or more learning targets.
 - b. The mastery points from knowledge checks make up about 60% of the course grade.
5. **Final:** The final category includes a
 - a. final knowledge check which will assess all learning targets.
 - b. And it includes a semester long project which assesses most of the learning targets.
 - c. The mastery points from this category make up about 40% of the grade.
6. **Homework:** I assign “Check Your Understanding” exercises each class.
 - a. I do not collect this or include it as part of their grade. It’s for practice.



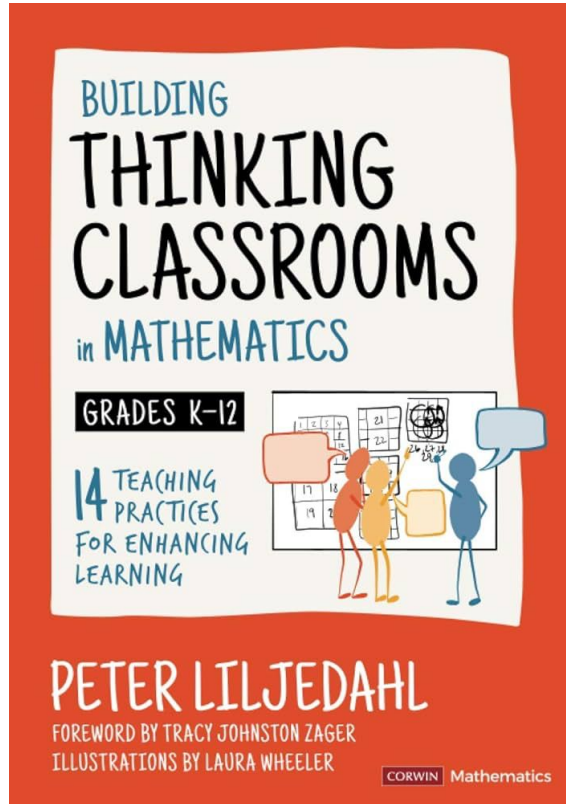
Learning Targets linked to CLOs

- **CLO A: Provide and interpret graphical displays of data**
 - Construct a histogram and/or bar graph from raw data
 - Interpret a histogram and/or bar graph.
 - Determine the shape of a set of data.
 - Construct a box and whisker plot.
 - Interpret a box and whisker plot.
 - Draw scatter plots of bi-variate data.
- **CLO B: Compute and interpret summary statistics**
 - Compute the five number summary and interpret.
 - Determine if there are outliers.
 - Compute the measures of center (mean, median, mode) and interpret them.
 - Compute the measures of spread (IQR, Range, Standard Deviation) and interpret them.
 - Know which measure of spread and center is appropriate for a given set of data.
- **CLO C: Calculate and interpret probabilities using sample spaces and probability laws**
 - Compute probabilities using empirical and theoretical approaches.
 - Compute probabilities that involve “and”.
 - Compute probabilities that involve “or”.
 - Compute conditional probabilities.
 - Determine if two events are independent.
 - Determine if two events are mutually exclusive.
- **CLO D: Calculate and interpret probabilities from probability distributions**
 - Determine if a discrete random variable meets the criteria for a binomial variable.
 - Compute probabilities using the binomial distribution.
 - Determine if a continuous random variable follows a normal distribution.
 - Compute probabilities using the normal distribution.
- **CLO E: Construct and interpret confidence intervals for means and proportions**
 - Use the central limit theorem
 - Construct and interpret a confidence interval for a proportion.
 - Construct and interpret a confidence interval for mean.
- **CLO F: Test and interpret hypotheses of population means and proportions**
 - State type 1 and type 2 errors.
 - State the null and alternative hypotheses.
 - Compute p-values and interpret the results.
- **CLO G: Calculate and interpret regression lines**
 - Compute the correlation coefficient coefficient of determination
 - Determine if there is a significant linear relationship between two numeric variables.
 - Compute and interpret the coefficient of determination
 - Compute the slope and y-intercept of a linear regression model.
 - Use a regression model to make predictions.

How to make this work with your LMS

1. Create a gradebook category for each course learning objective.
 - a. This semester I set these categories to be equally weighted and to add up to 60%.
 - b. Add a gradebook item worth 4 points for each learning target.
2. Create a gradebook category for the final and weight it at 40%.
 - a. Add the project and the final knowledge check.
 - b. The points for these equals $4 * (\text{number of learning targets assessed})$.
3. In Canvas, I set up a grade scheme so that the appropriate letter grade is displayed based on their current percent.
4. Create a miscellaneous category for any other assignments that won't be used as part of the final grade.
 - a. This is where I post the check your understanding problems. I use MyOpenMath and can see who does these.
 - b. Anytime I post an assignment on Canvas, students always complete it, even if it's not part of the final grade

Resources



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