

Implementing Standards-Based Grading: A Structured Approach for Easy Adoption

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Abstract

This paper presents a structured approach to Standards-Based Grading (SBG) designed to minimize adoption barriers. Despite SBG's benefits of focusing on learning mastery rather than point accumulation, instructors often resist implementation due to perceived workload. Our method leverages existing Course Learning Outcomes to efficiently define standards, minimizing upfront workload for the instructor, and employs a comprehensive assessment mapping that connects every evaluation item to its corresponding standard. Preliminary results from multiple courses demonstrate that this approach successfully addresses common SBG challenges, creating positive experiences for both instructors new to SBG and their students while maintaining pedagogical benefits.

CCS Concepts

• **Social and professional topics** → **Student assessment.**

Keywords

Standards-Based Grading, Computing Education, Assessment Design

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1 Introduction and Related Work

Standards-Based Grading (SBG) is an assessment approach that focuses on students' mastery of individual learning objectives, rather than a weighted aggregation of points [5]. In essence, students' final grades are determined based on their demonstration of mastery of individual standards, with multiple opportunities to demonstrate proficiency. This approach allows students to achieve success at different rates according to their unique strengths and limitations. By evaluating learning through specific competencies or standards, SBG offers benefits such as more accurate assessment of skills, clearer feedback, a more equitable assessment environment, and increased student motivation [1, 3, 4]. Despite these advantages,

adopting SBG in higher education remains challenging. A key barrier is the significant upfront effort and pedagogical shift required of instructors, particularly the need to define detailed grade standards for the entire course before instruction begins. These barriers often lead to resistance or hesitation in implementation [2, 6].

In this paper, we present a structured Standards-Based Grading implementation in undergraduate computing courses designed to minimize barriers to entry for instructors new to SBG. Our approach leverages existing Course Learning Outcomes (CLOs) to define grading standards efficiently with minimal upfront effort. Each CLO translates directly into multiple standards that represent distinct levels of achievement. The foundation of our method is a comprehensive standard-assessment mapping developed before the course begins, which explicitly connects every assessment item to its corresponding standard. This upfront planning provides both instructors and students with a clear roadmap showing how each assessment contributes to mastering course outcomes. Consequently, students understand from the start exactly how they will be evaluated, while instructors benefit from a well-structured assessment plan that guides them throughout the term. Overall, our goals are to make SBG adoption straightforward and to enhance clarity in the teaching and learning process. Both instructor and student experiences with this SBG implementation were overwhelmingly positive, reinforcing that a well-structured, transparent system can demystify SBG and encourage broader adoption.

2 Implementation

Design Principles. Our SBG design was guided by key principles to maximize clarity and simplicity: (1) **Alignment with CLOs:** Each standard is linked to a course learning outcome, reflecting levels of mastery within those outcomes; (2) **Demonstration of Mastery:** To exhibit mastery of a standard, students must perform multiple, varied tasks associated with that standard, typically involving at least *three* distinct tasks at different times; (3) **Opportunities for Reassessment:** Students are afforded multiple opportunities to demonstrate their achievement of a standard. Since three tasks are necessary to fulfill a standard, more than three tasks will be available for students to showcase their mastery, acknowledging the educational value of initial unsuccessful attempts; (4) **Continuous Progress Tracking:** Students have continuous access to information regarding their progress, including the standards they have met and the number of tasks they have completed for each standard; and (5) **Clarity in Assessment:** All assessment questions and tasks are labeled with the specific standard they aim to assess, ensuring clarity and transparency in the evaluation process. All principles are communicated in the course syllabus and/or the learning management system.

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Standard-Assessment Mapping														
Standard	Quiz 1-1	Quiz 1-2	Lab 2-1	Lab 2-2	Test 1	Reflection 1	Quiz 3-1	Quiz 3-2	Quiz 3-3	Lab 4-1	Lab 4-2	Test 2	Reflection 2	TOTAL tasks available
CLO1-C	1	1	1	1	1	1				1	1			8
CLO1-B				1	1	1	1	1	1			1		7
CLO1-A					2					1	1	2		6
CLO2-C				1	1	1			1	1	1	1	1	8
CLO2-B				1	1	1			1	1	1	1		7
CLO2-A				1	1					1	1	2		6
CLO3-C	1	1	1	1	1					1	1	1		8
CLO3-B			1	1	2					1	1	1		7
CLO3-A			1	1	1					1	1	1		6
CLO4-C							1	1	1	1	1	2	1	8
CLO4-B							1	1	1	1	1	2		7
CLO4-A								1	1	1	1	2		6
CLO5-C							1	1	1	1	2	1	1	8
CLO5-B								1	1	2	1	1	1	7
CLO5-A								1	1	1	1	2		6

Figure 1: Example standard-assignments mapping showing how course assessments (columns) align with standards (rows).

Defining Standards. The method for defining standards is intentionally straightforward. For each course learning outcome, we define three standards representing distinct levels (A, B, and C) of achievement. For example, standards corresponding to CLO1 are designated as CLO1-A, CLO1-B, and CLO1-C. A standard such as CLO1-B indicates achievement at B-level proficiency in the competencies described in CLO1, where “B-level” aligns with the university’s established grading scale. This streamlined approach enables instructors new to SBG to create standards with close-to-zero effort, overcoming one of the main barriers to adopting SBG.

Table 1: Example criteria for final course grades

A+	all A-level, B-level, and C-level standards
A	3 out of 5 A-level standards, all B-level and C-level standards
B+	all B-level and C-level standards
B	3 out of 5 B-level standards, and all C-level standards
C	all C-level standards
D	3 out of 5 C-level standards

Assessment-Standard Mapping. A cornerstone of the implementation is a comprehensive standard-to-assessment mapping that the instructor develops before the semester. This mapping is a spreadsheet listing every assessment component (quizzes, assignments, exams, etc.) and indicating which standards each assessment addresses. A read-only link to the spreadsheet is shared with students for full transparency. Figure 1 provides an example showing columns for each assessment and rows for each standard, with numeric values indicating opportunities for students to demonstrate mastery. This structure ensures all standards are assessed following the design principles: each standard is assessed multiple times throughout the semester, students have multiple opportunities to demonstrate mastery, and students can anticipate which standards will be the focus of each assessment. From the instructor’s perspective, this provides transparency and timely updates on student progress standard-by-standard. Additionally, designing questions for each assessment becomes mechanical since the standards to be assessed are specified, eliminating the need for instructors to spend

significant creative effort deciding what content to include. Each question is labeled with the standard it assesses, helping students understand how their performance on each question contributes to their overall grade. This level organization is crucial for lowering the barrier to entry for both instructors and students.

Course Grading Scheme. The final course grade is determined based on the standards each student has achieved by the end of the course. Table 1 shows an example of the criteria for each course grade level.

3 Preliminary Results and Future Work

The SBG model has been successfully implemented in three computing courses with promising results. Our framework helps instructors with no prior SBG experience address key challenges like upfront design work and student confusion. Students appreciated the system’s transparency, understanding what they were learning and how they’d be assessed, which fostered trust and emphasized mastery. The model also enabled flexible evaluation methods including oral exams and workplace assessments. Both instructor and student feedback was overwhelmingly positive. Future work will analyze student behavioral patterns to develop refined implementation guidelines for broader adoption.

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