

WIP: Contract grading as an alternative grading structure and assessment approach for a process-oriented, first-year course

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Introduction

This Work-in-Progress paper describes the application and outcomes of using contract grading in a second semester engineering seminar. A brief history of contract grading is provided, as well as possible advantages of this grading system. This paper focuses on 1) the structure of contract grading used in a first-year engineering seminar, 2) aspects of metacognitive learning in resubmitting assignments to meet the contract requirements, 3) student survey feedback, and 4) challenges and lessons learned from first-time implementation.

Background

Contract grading has a long history; it is not a new concept. Though there are numerous publications from the late twentieth century (1970s–1990s), articles date back to the 1920s [1]. In the last fifteen years, there appears to be a resurgence of interest in contract grading, partly due to deficits in traditional grading systems, such as more focus on the grade received than interest in learning (i.e., extrinsic motivation for learning) [2,3] and subjective and biased grading [4]. Implicit biases and incorporating student behavior (e.g., class participation, disinterest during class) into grades on assignments where behavior is not explicitly assessed are two examples of biased grading within traditional grading systems [5]. In contrast, contract grading is touted in literature for many benefits, including reducing grade anxiety [6], allowing students to take more ownership for their grade [7], and increasing motivation and commitment [8]. In addition, contract grading is associated with building equity and inclusion [9]. However, not all authors agree on the merits of contract grading [10].

Contract grading has been used more often in writing courses and is notably promoted by Asao Inoue [1,9]. In examining existing literature, there are very few examples of contract grading in engineering courses [11]; no published articles from the United States were found. However, contract grading is especially applicable in process-oriented courses, and it may increase student accountability since they know the requirements at the onset of the class. In addition, contract grading systems where students can repeat an assignment that falls below a threshold (i.e. mastery learning) may be advantageous for students in multiple ways. For example, repeating an assignment is one approach to reduce the grade penalty for students who come in less prepared than their peers.

Methods

Contract grading was used in lab sections of a one-credit, second semester engineering seminar in a large urban, minority serving institution in the southwestern US. The majority of students had declared an interest in civil engineering or construction management. In total, 34 students enrolled in the course, and survey results were obtained for 31 students. Not all students answered all questions on the survey. The course used contract grading as both a grading structure and a form of assessment. The contracts were determined in advance by the instructor and included attendance and number of assignments completed. Required assessments had

criteria-based rubrics indicating what was needed to achieve correct/incorrect or excellent/adequate/insufficient levels. Correct and excellent or adequate marks on the criteria meant that the student successfully completed the assignment. If students received incorrect or insufficient, the assignment did not count toward meeting contract requirements. However, students could revise and resubmit the assignment along with a reflection (metacognitive component) on what was missed and how they could avoid incorrect or insufficient marks in the future. All submissions were manually graded within a learning management system.

Results and discussion

At the end of the course, students completed a survey about their experience with contract grading in this course. Questions are shown within Figures 1 and 2, along with student responses to the questions using a 5-level Likert scale.

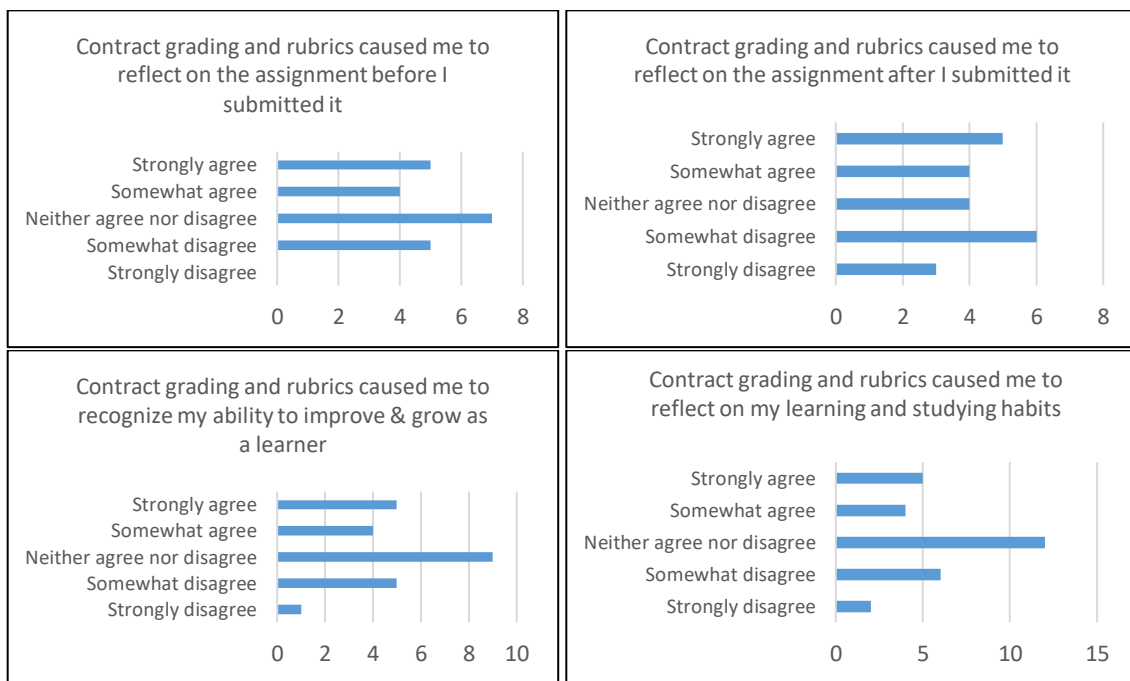


Figure 1. Student responses to questions about reflection and growth as a learner through contract grading and rubrics.

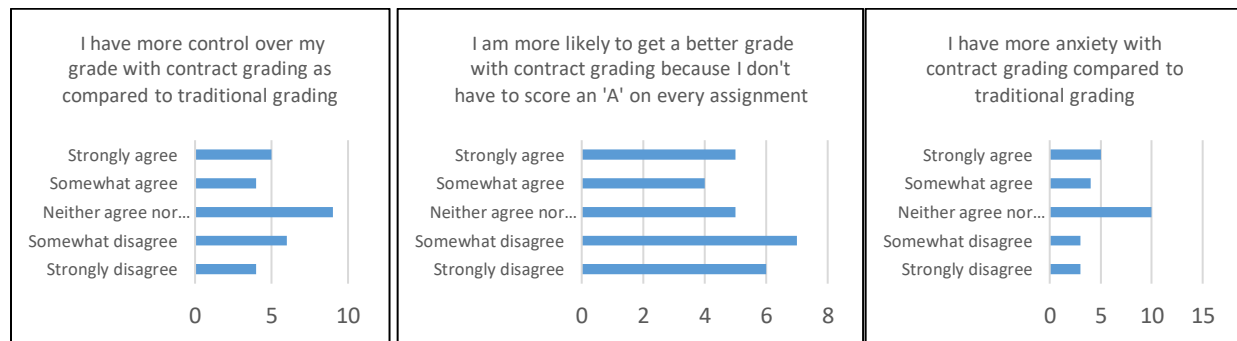


Figure 2. Student responses to questions about control over their grade and anxiety associated with grades.

A greater proportion of students agreed (vs. disagreed) that they reflected on rubric criteria before submitting as compared to after submitting the assignment. A greater proportion of students agreed (vs. disagreed) that the grading system caused them to recognize their ability to improve and grow as a learner. Students did not feel that contract grading gave them more control over their grade nor that they were likely to get a better grade compared to traditional grading. Also, most students did not have more or less anxiety with contract grading.

Lessons learned

As this was the first course where most students (84%) experienced contract grading and the instructor's first attempt with this approach, there were challenges on both ends. Lessons learned are provided to help other instructors wishing to convert from a traditional grading system to contract grading. First, the contract was imposed by the instructor with no negotiation from the student. In retrospect, it would be better to involve the students in the process. Second, the students were not experienced in comparing their assignment to the rubric prior to submitting. Although, by the end of the course, about half of the students (42%) indicated that rubrics caused them to reflect on their assignment before submitting, this number should be much higher. After giving the first assignment, the instructor could take time in class to have students look at the rubric, compare it to their product, and complete peer evaluation of assignments. This could reduce the number of students who end up not meeting the criteria and resubmitting the assignment. It may also improve their overall view and understanding of the grading system.

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