

6th icCSBs 2017
**The Annual International Conference on Cognitive-Social,
and Behavioural Sciences**

**EVALUATING THE PLUS/MINUS GRADING SYSTEM FOR
UNDERGRADUATE COURSES**

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Abstract

A variety of grading systems, including a whole-letter grading system, are used in American education. A letter plus/minus grading system (e.g., B+, C-) has become increasingly common in U.S. undergraduate higher education: a trend that has also attracted considerable debate. Yet the literature about the effects of the plus/minus grading system is limited. Historically, the U.S. institution in the Western Pacific where the present investigation was conducted did not allow for plus/minus grades in undergraduate courses. The present paper therefore discusses a survey of faculty, their differing perspectives, and how the institution eventually adopted plus/minus grading for undergraduate courses. This case study provides evidence that plus/minus grading, while imperfect, is superior as a measure of academic performance in terms of grade point averages, grade accuracy, and fairness in grading.

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Keywords: Plus/minus grading system, undergraduate grading, faculty senate and governance.

1. Introduction

In most cases, “students’ performance in an academic program is determined by the final grades they achieve in required courses. These grades result from the course instructor assigning letter or number grades to summarize all evaluations of a student’s performance during the course” (Barnes & Buring, 2012, p.1). In 1883, Harvard University initiated its own grading system, using letter grades which became very popular across the country (Karim & Hossain, 2014).

Academic “grading” in undergraduate higher education commonly takes on the form of five letter grades using the 4.0 scale: A = 4 (Excellent); B = 3 (Good); C = 2 (Satisfactory); D = 1 (Poor/Passing); and F = 0 (Failure). Consequently, “the rigid system of grades and evaluations has become synonymous with the modern institution of education” (Best College Reviews, 2016, 1).

Grading, which is normally provided by teachers, is a powerful tool that teachers use to communicate with students (Adams, 1998). Generally, the goal of grading is to assess individual students’ learning outcomes. Recent trends of assessing student performance, according to Malone, Nelson, and Nelson (2002), represent a departure from the traditional grading system of A, B, C, D, and F, together with Pass/Fail, Satisfactory/Unsatisfactory, Credit/No credit and other types of scales that have emerged. One that seems to have increasing implementation is the “plus/minus grading” system. Many U.S. institutions of higher education “have adopted or are considering adopting a grading system that provides a larger number of marking choices than the A through F whole-letter system. This usually takes the form of a plus/minus grading system in one version or another” (Morgan, Tallman, & Williams, 2007, p. 1)

2. Problem Statement

The most common reason to use the plus/minus grading system might be related to face validity: “the belief that a +/- grading system can either reverse the progression of grade inflation or counter its effects by establishing more grade choices so that performance can be more effectively differentiated” (Morgan et. al, 2007, p.1). Contemporary American higher education attracts a wider variety of students than ever before (Dunn, Morgan, O’Reilly, & Parry, 2004) and students are more diverse in terms of culture, ethnicity, age, socioeconomic status, and expectations. An American Pacific island university where this study was conducted had also a diverse student population. Increased differentiation among students’ levels of performance represents one important advantage of plus/minus grading (Barnes & Buring, 2012).

Important factors in support of plus/minus grading, therefore, are “the ability to better differentiate student performance, the reduction of grade inflation, the incentive to motivate students to study for final exams, and the appearance of a more rigorous academic program” (Newhouse & Swenty, 2014, p. 1). Sadler (2009) has argued that “grade inflation occurs when high grades are awarded for progressively lower and lower achievements. Grades then lose a great deal of their meaning and usefulness” (p. 823). Accordingly, “in response to the growing problem of grade inflation as well as the changing demands of students and faculty, many colleges and universities are re-examining their grading systems” (Bressette, 2002, p. 29).

Giving emphasis to that “the fair and accurate assessment of student performance is an integral part of teaching and learning, and those administering the evaluation process should take this responsibility seriously” (p. 11). Malone et al. (2002) analyzed grades for 8,088 graduate students to determine whether there were differences in grading patterns between the traditional system (A, B, C, D, and F) and the plus/minus grading system (A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D-, and F). As a result, in response to a particular question (Does the plus/minus grading system allow graduate faculty to improve the accuracy of assessing student learning and performance?), faculty in all academic areas (i.e.,

Applied Sciences, Architecture, Business, Communication Sciences, Education, Humanities/Arts, Life Sciences, Physical Sciences, and Psychology) agreed that the plus/minus system improved the accuracy of assessing student learning and performance: “Faculty felt strongly that the plus/minus grading system held an average in that it enabled them to be more precise in assigning grades” (p. 19).

In addition, Malone et al.’s study indicated that younger faculty or faculty who were lower ranked tended to use plus/minus grading more than older faculty or faculty who were higher ranked, supporting Wilamowsky, Dickman, and Epstein’s (2008) following observation:

Teachers are under pressure to give higher grades wherever possible. This may result from the current culture of students as consumers, greater involvement of parents in their children’s college lives including grades, and the use of student evaluations in assessing teacher performance. This pressure causes a professor to give any benefit of the doubt to the student, and in particular, if grade is borderline to award the higher grade. With the possibility of pluses and minuses, rather than giving an A instead of a B, a professor may give the student a B+ or an A-. (p. 1)

Broadly speaking, professors tend to give higher grades wherever possible. As argued by Wilamowsky et al., situational factors, such as perceptions of grade deflation in a particular department and a professor’s application for promotion or tenure, also contribute to high grades.

The grading system used in American undergraduate higher education is predominantly based on the notion of an index of achievement on a scale from 0 to 100, with the typical corresponding percentage scale as follows: A = 90–100, B = 80–89, C = 70–79, D = 60–69, and F = 59 or below (Elikai & Schuhmann, 2010). Professors using the traditional grading scales encounter a dilemma. For instance, a student who earned an 89 average would most likely receive the same grade as a student who earned an 80 average, such that both receive a B grade: even though the student who achieved the 89 average has substantially outperformed the one receiving the 80 average (Newhouse & Swenty, 2014). For this reason, the use of plus/minus grading may serve as a motivator for students to apply more effort on all assignments to receive higher grades (e.g., a B+ compared to a B) (Docan, 2006).

3. Research Questions

This U.S. institution of higher education is located on an island in the Western Pacific. In addition to the unique geographical location of the island, this institution functions as an intellectual conduit for the people and other institutions of the Western Pacific Region, East Asia, and the world to learn from one other, within an American higher education framework. With an enrolment of 3991 students including 295 graduate students (Fall 2016), the institution’s student demographics were as follows: 43% male and 57% female; 73% full time and 27 part time; 48.2% Pacific Islander, 44.1% Asian, 3.2% White/Non-Hispanic, 0.7% Black/African American, 0.6% Hispanic, 2.1%; 0.1 % Native American/Alaskan, and 1% Non-Resident Alien (i.e., international students); average age of undergraduates: 23, graduates: 32, non-degree: 35. On the other hand, during Fall 2016, the institution’s 191 full-time faculty demographics were as follows: 58% male and 42 female; 41% White/Non-Hispanic,

24% Asian, 28% Pacific Islander, 2% Hispanic, 2% Black/African American, and 3% Other or two or more races and ethnicities; 52% tenured, 30% on tenure track, and 17% not on tenure track.

In the academic year 2002-2003, the institution changed from the whole-letter grading system to the plus/minus grading system only for graduate courses. In the adopted system, an A+ grade is a qualitative grade difference from an A, so both grades carry the same quantitative points (as seen in Table 01). It indicates that the student has exceeded the course expectation but the point value does not change. This was a major point of disagreement when graduate faculty made this change, but it currently remains in policy. Graduate programs at this institution do not use a grade of D. The use of plus/minus grading, therefore, offers professors a wider range of differentiations among varying levels of student performance, as compared with the older system (using only A, B, C, and F), and thus, graduate faculty members seem satisfied adopting it.

Table 01. Adopted Graduate Grading System

Grade	Grade Points	Description
A+	4.0	Outstanding
A	4.0	Excellent
A-	3.7	Very Good
B+	3.3	High Average
B	3.0	Average
B-	2.7	Low Average
C+	2.3	Below Average
C	2.0	Marginal
F	0.0	Failure

At this institution, as elsewhere, the plus/minus grading system provides “an antidote to a grade inflation, since a student barely earning an A grade would receive an A–grade, rather than an A grade. Proponents also suggest that it increases student motivation (to earn a “high A” rather than an A–)” (Johnston, 2012, p. 1). It is true indeed that the present author’s own graduate students dislike receiving grades of A–, preferring to target grades of A, and hoping for A+.

4. Purpose of the Study

As stated earlier, the institution adopted plus/minus grading for graduate courses but not for undergraduate courses. Therefore, the institution’s Faculty Senate Standing Committee on Evaluation was assigned to investigate the possible adoption of plus/minus grading to undergraduate courses as well. The present paper’s author was the chair of the Committee.

It was felt that not only did the traditional whole-letter grading system not allow for adequate differentiation between students who perform at different levels, but also that students at this institution competing for scholarships or admissions to graduate programs were at an unfair disadvantage, given that some of their competition (from other universities) have grades of A+: which some students at the institution (e.g., with 99% or 100% averages) earned, but could not be awarded, under the present system.

In general, in the plus/minus grading system, there “would be little change in the overall students’ cumulative GPAs, but a decrease in the number of students with a perfect 4.0 GPA could be expected” (Long & Norabito, 2014, p. 230).

4.1. Preliminary Analysis

In this institution, plus/minus grading scales were never implemented. Therefore, when consulting with faculty members on the option of plus/minus grading, it was necessary to determine how class grade point averages as well as individual grade point averages would change if the plus/minus grading system were implemented: based on actual data.

The author of the present paper compared grades for her undergraduate courses in education, as computed using the system in place at the institution (A through F; no + or -), with the grades the same students would have received if + or - designations had been allowed. As a result, the class averages of grades each semester or summer session were largely unaffected (see Tables 02 and 03), but plus/minus grading would have influenced individual students’ GPAs.

The average class grades were quite stable from Summer 2013 through Summer 2015 (see Table 04) in both the current system (highest 3.00, lowest 2.88) and the plus/minus grading system (highest 3.11, lowest 2.79). In these courses, the grading scale was fixed (not based on a curve), so that one student’s grade did not influence another student’s grade. The data showed the stability of the mean grades. These data supply an example of the plus/minus grading system not contributing to grade inflation, since the average grades are the same in each course.

Students who have more plus grades will have slightly higher GPAs (e.g., 3.3 instead of 3.0 for students with all B+ grades, and 2.3 instead of 2.0 for students with all C+ grades); and students who have most minus grades will have slightly lower GPAs (e.g., 3.7 instead of 4.0 for students with all A- grades, or 2.7 instead of 3.0 for students with all B-grades).

While the *accuracy*, *fairness*, and *consistency* of grades will be increased in the plus/minus grading system, both the number of students receiving honors and the number of students placed on academic probation will increase. That is to say, “since a C- grade will be considered a 1.66, students who receive C- may end up on academic probation A possible benefit to the new grading system is that students who excel in their classes will have more competitive GPAs for transferring and receiving scholarships” (Arafat, 2016, p. 1).

Table 02. Adopted Graduate Grading System

Grade	Grade Points							
		SU15	SP15	FA14	SU14	SP14	FA13	SU13
A	4.0		1	6	3	4	3	1
B	3.0	11	11	12	14	14	9	10
C	2.0		2	5	2	3	3	4
D	1.0						1	
F	0.0			1				
Enrolment		11	14	24	19	21	16	15
Class Average		3.00	2.92	2.92	3.05	3.05	2.88	2.80

Table 03. The Case Used the Plus/Minus Grading System

Grade	Grade Points							
		SU15	SP15	FA14	SU14	SP14	FA13	SU13
A+	4.3							
A	4.0			1				
A-	3.7		1	5	3	4	3	1
B+	3.3	5	2	2	1	5	3	3
B	3.0	5	9	3	10	5	3	7
B-	2.7	1	1	7	4	4	3	
C+	2.3		1	1	1	1	1	2
C	2.0			3		2	2	2
C-	1.7			1				
D+	1.3							
D	1.0						1	
D-	0.7							
F	0			1				
Enrolment		11	14	24	19	21	16	15
Class Average		3.11	3.02	2.79	3.03	3.02	2.83	2.88

Table 04. The Case Used the Plus/Minus Grading System

Semester/Session	Enrolment	Traditional system	Plus/minus system
		Class average	Class average
Summer 2015	11	3.00	3.11
Spring 2015	14	2.92	3.02
Fall 2015	24	2.92	2.79
Summer 2014	19	3.05	3.03
Spring 2014	21	3.05	3.02
Fall 2013	16	2.88	2.83
Summer 2013	15	2.80	2.88

5. Research Methods

In September of 2016, the Committee used Qualtrics (a web-based survey tool) to conduct an online survey of faculty, publicized with multiple emails to all faculty. Historically, this institution's standard letter grading system of A, B, C, D, and F has not included grades such as B+ or C- as an option. The survey therefore concentrated on one issue, to determine whether faculty consensus on this important yet intriguing question, is possible. The internal survey (combining quantitative and qualitative items) focused on the following question: "Would you prefer to have the option of using the plus/minus grading system in undergraduate courses?" (a yes-no question; quantitative) and asked participating faculty to indicate their reasons for answering Yes or No (an open-ended question; qualitative). The eight days during which the survey was available included a reminder emailed to all faculty. To interpret the obtained response rate, the following information was practically useful: "Internal surveys will generally receive a 30–40% response rate (or more) on average, compared to an average 10–15% response rate for external surveys" (survey gizmo, 5–6).

6. Findings

Out of 191 full-time faculty members, 123 faculty members responded (64% response rate), although 7 respondents did not respond Yes or No to the survey question. Among the 116 faculty who did answer the question, 76 (66%) responded affirmatively and 40 (34%) responded negatively. Representative reasons for both affirmative and negative responses are as follows:

6.1. Reasons in favor of the option

- The plus/minus grading system better reflects the variances in academic achievement, especially with regards to effort and success. The distance between the letter grades makes it difficult to accurately reflect the performance of the students and to distinguish among them.
- The current grading system does not accurately and fairly represent the work students are doing in the undergraduate courses.
- Our students are competing (for graduate admissions, scholarships, etc.) with other students who get A+ grades. Therefore, students who earned an A+ should get it, and the earned advantages that come with it.
- It gives greater flexibility and provides a more accurate picture of class performance. A student who received 99% and another who received a 91% should not end up with the same "A." An A+ and A- would be a more realistic depiction of in-class performance.
- This system would be an asset to students who apply to various graduate programs in making them potentially more competitive, with B+ increasing their GPA.
- It is a significantly more fair to the students. A student who barely makes a B gets the same grade currently as someone who just missed moving into an A.
- Students will be motivated to their best instead of the minimal of an A, B, C, or D. I think that the students that put more work into the class should be rewarded a higher grade than someone who doesn't such as getting an A+ compared to an A-.

6.2. Reasons against the option

- The numerical values provide a clearer position. Why would we need to translate it?
- Much more work in justifying small variations in overall qualitative difference for no real purpose. Needlessly complicates grading.
- Waste of time for faculty and not really clear how you differentiate +/-levels.
- Evaluation of undergraduate student must be quantitative exact to A = 4.0; B = 3.0; C = 2.0; D = 1.0, and F= 0.0.
- The plus/minus system does not help the student. It is unnecessarily complex.
- There is no need to categorize or separate undergraduate performances to this degree.
- In the case of transfers, numerical equivalents would be more accurate.
- This is more cumbersome than the current system and may not work as well for courses with more holistic grading schemes.

A clear majority of the faculty who responded favor the adoption of the plus/minus grading system as an option. Moreover, in comparison with the minority voting “No,” faculty supporting this option typically provided more detailed and more clearly described reasons.

Considering the faculty survey results, the Committee decided to recommend implementing the plus/minus grading system for undergraduate courses as an **option** for instructors. In that case, instructors who do not wish to make use of the plus/minus designations may continue to assign simple letter grades (current A–B–C–D–F system) without changes to the corresponding numerical values.

For instance, in Southern Illinois University, Bemidji State University, and Case Western Reserve University in the United States, faculty members could add plus and minus designations to traditional letter grades. The new system simply gives instructors more options for evaluation, and an increased flexibility. The decision of whether to employ it or not is left to the discretion of the instructor.

The proposed expanded system for the various grades along with their corresponding numerical values is shown in Table 5. The suffixes plus (+) and minus (–) distinguish higher and lower levels of performance, respectively, within each of the letter grade domains, A through D. And note that, as with the institution’s current graduate grading system, 4.0 grade points will be assigned for an A+ (an A+ grade is a qualitative grade difference from an A: both grades carry the same quantitative points). Some institutions use 4.3 points for an A+. The following comment from a participating faculty member addresses this point:

“The plus/minus grading system will allow for a more accurate difference between the work of students. The only thing I do not agree with is an A+ and an A having equal weight. This will not allow for a distinction between the very top students.”

Table 05. Proposed Plus/Minus Grading System

Letter Grade	Grade Points	Percentage Scale	Description
A+	4.0	98–100	Excellent
A	4.0	93–97	
A–	3.7	90–92	
B+	3.3	88–89	Above Average
B	3.0	83–87	
B–	2.7	80–82	
C+	2.3	78–79	Average
C	2.0	73–77	
C–	1.7	70–72	Minimal Passing
D+	1.3	68–69	
D	1.0	63–67	
D–	0.7	60–62	
F	0.0	>59	Failure

The proposal submitted by the Committee was presented during the Faculty Senate meeting in October of 2016. Consequently, the Committee developed a resolution supporting an optional plus/minus grading system for undergraduate courses. In the December meeting of 2016, the Senate passed this

resolution. It should be noted, however, that just as professors cannot satisfy every student, it is impossible to satisfy all faculty members on the issue of plus/minus grading.

It was announced by the institution's Senior Vice President of Academic and Student Affairs that the new grading system policy, effective for the Fall 2017 semester, which now allows faculty to utilize plus/minus options on letter grades, including "A+"; and this policy applies to all undergraduate courses.

7. Conclusion

As a final analysis, as noted by Mohler (2000), major advantages of the plus/minus grading system include: a more accurate reflection of differing levels of students' achievements in a course; more informative feedback to students on the quality of their work; better motivating students in the middle of a letter grade range to complete end-of-semester work; and for students of an A grade, a greater competitive edge in the graduate school admissions process. Disadvantages of the plus/minus grading system include: GPAs decreasing very slightly in this system; and the possibility of more clerical errors in the recording of grades. Furthermore, as Malone, et al (2002) states, some believe that the standard 5-point (A-B-C-D-F) system creates a competitive disadvantage for the institution's best performing students; and in contrast, that the plus/minus grading system validly adds information to student profiles and improves accuracy in grading.

One must concede that, even though the plus/minus grading system may provide a more fair and accurate evaluation of student performance (a fundamental responsibility of the faculty), no faculty member can assess student performance entirely fairly and accurately. All grading includes a subjective component. Even so, the "plus/minus grading" system arguably offers a superior response to the fact that "the accuracy and consistency of grades as a measure of academic performance is increasingly being called into question" (Best College Reviews, n. d., 1).

Consistent with the available literature, this study indicates that strong reasons support plus/minus grading, including these provided by the faculty: that grades are more accurate and refined under the new system; and that grades are fairer for students, providing more appropriate rewards for demonstrated mastery. Based on the notion that "students are motivated to work harder under a +/-system" (Morgan, Tallman, & Williams, 2007, p. 3), future studies should focus on its impact on student motivation. In addition, studies may address the possibility that +/- grades will help combat grade inflation.

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