

FLEXIBLE DEADLINES AND STATISTICAL COMMUNICATION

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Proper communication of statistical methods and results are pertinent to the progression of scientific discovery. With stress levels of post-secondary students being on the rise, appropriate assessment design is vital to ensuring that students are supported. This paper discusses the implementation of a flexible late policy, with no grade penalty, applied to writing assignments of a large third-year statistics, undergraduate course. The paper investigates the usage of the flexible late policy across report style assignments, and students' feelings about the late policy. Results show that 310 (97%) of students in the course used the grace period, and 264 (83%) used it on all assignments. Additionally, results show that 313 (98%) of the students in the study were happy that the grace period was available. Thus, it is recommended that instructors of large classes consider invoking a flexible grace period policy on large writing assessments in statistics (or other STEM) courses.

INTRODUCTION

Stress levels of post-secondary students are on the rise as students balance adjustment to post-secondary lifestyle, navigate social issues and handle new financial stressors (Linden, 2020). Poor mental health can be associated with negative physical health outcomes, depression, and even suicide. In addition to the stressors mentioned previously, a large portion of student stress attributed to pressure associated with student academics (e.g., test grades, deadlines, etc.) (Linden, 2022). Additionally, students in STEM (Science, Technology, Engineering and Mathematics) courses tend to feel under-equipped when tasked with communication-style assessments, as their training is often self-viewed as more technical and objective (Wilkins, 2015). This generally relates the subjectivity of writing/communicating to be a daunting, anxiety-inducing task.

Invoking “kind”, “generous” and “flexible” policies, to improve student mental health outcomes, when designing courses for post-secondary students is becoming more popular amongst instructors (Easton, 2022). In hopes of reducing student stressors/anxiety, a “flexible-late policy” was instated in a large, third-year, undergraduate statistics course for writing-based, report-style assessments.

The course investigated in this study is a large third year (one semester, 12-week) course with a focus on exploring survey design, sampling techniques and observational data analysis. The course took place in Fall of 2022 and included two lecture section, with a total of approximately 500 students at the start of the course and approximately 450 students at the end of the semester. The course assessments have a strong focus on statistical communication, along with statistical programming and theory, consisting of two methods-style reports, one midterm, a final exam and weekly quizzes/surveys.

As previously mentioned, communication of statistical findings is pertinent to all aspects of the scientific process. Thus, being able to relay motivations, methods, results and conclusions of a statistical analysis to a scientific audience is a learning expectation of the course described in this study. In order to assess this learning outcome, the course has been designed to have students work on two different report style Assignments in the course. In the first assignment (due about four weeks into the semester) students are asked to design a survey, collect or simulate data from the survey, and perform a small analysis (one hypothesis test and confidence interval) of the collected/simulated data. The main deliverable of Assignment 1 is a written report which includes: (1) a research goal/question, (2) a description/critique of the survey, (3) a description of the method(s) used to analyze the collected/simulated data, and (4) a description of the findings of the analysis (i.e., an answer to the proposed research question). Assignment 1 is completed individually. In the second assignment (due about 10 weeks into the semester) students are asked to write a methods style paper (i.e., Abstract, Introduction, Data, Methods, Results, Conclusions) of a multilevel regression post-stratification analysis applied to some election poll data, to predict the outcome of the next Canadian federal election. For Assignment 2, students had the option to work individually or in pairs or in groups of size three or four, all groups were self-selected.

Throughout the course, many resources were provided to students in order to support the development of their writing skills, specific to the writing assignments in the course. For example, detailed instructions were provided at least two weeks in advance of the due date, many teaching assistant (TA) office hours were offered leading up to the assignment due date, detailed rubrics were posted at least one week prior to due dates, writing center contact information was promoted in class and on the course website, workshops tailored to writing reports were offered specifically to students in the class, and lessons were designed to have formative assessments for students to work on their writing and communication. Beyond all this, a special English Language Learning (ELL) TA was hired in the Fall of 2022 for this course. This TA was specifically trained on Writing-Integrated Teaching (WIT) and thus they reviewed all assessment instructions, rubrics and class materials. Additionally, this TA offered training to the TAs who performed grading of writing and would do benchmarking to ensure grading was consistent across the course.

In valuing the importance of statistical communication, but whilst keeping in mind the student-specific stress surrounding writing and communication, for those in statistics programs, a flexible late policy was offered to students for the two report-style assignments in the course. Specifically, students were instructed of the due dates for Assignment 1 and Assignment 2 at the start of the course but were told if they needed more time on either assignment there was a one-week grace period available for each assignment, no questions asked, no grade penalty. The only “disincentive” for using the grace period was a longer turn around time in returning of grades to students. Namely, students who submitted by the assignment deadline (i.e., did not use the grace period) would receive their grade (and personal feedback on their writing/report) within one week, whereas those who used the grace period would need to wait at least 3 weeks for their grade (and personal feedback). Note: grades and feedback were still returned to all students before instructions for the next communication style assessment, and a “common points of feedback on Assignment X” document was posted on the course website (and discussed in class) was posted immediately after the grace period closed. Overall, this flexible grace period policy was first introduced into this course in the Fall 2022 iteration, and it was developed based on previously published studies invoking “radical generosity” assessments in classes with a focus on writing (Caldwell, 2022).

In addition to the desire to support students’ well-being, this grace period was also invoked to reduce the amount of administrative work applied to the teaching team (instructor and 10 TAs) of this large undergraduate course. Specifically, by creating a global policy that is flexible for all students, the teaching team was aiming to reduce the number of extension requests needed to be processed for the two assignments in the course.

The purpose of this study is to explore the students’ feelings and attitudes toward the “flexible grace period policy”. Specifically, we are looking to answer the following two research questions: (1) *What are the rates of usage of the grace period on Assignment 1 and Assignment 2, of all students in the course in Fall 2022?* and (2) *What are students’ general opinions of the grace period? Specifically, did they like or dislike the grace period being available for Assignment 1 and Assignment 2?*

In the Methods section of this paper, I will describe the implementation and design of the survey used to collect student feedback on their usage of the grace period and the feelings about it being available. Additionally, the Methods section will also discuss the subsequent analysis performed on the collected data in order to answer the research questions described above. The Results section of this paper will provide the outcomes of the analysis described in the Methods section along with a description of the key points of interest. The Discussion section will provide a brief summary of the study, describe key findings and discuss limitations of this student and future recommendations.

METHOD

Survey Design and Collection

As mentioned previously, (a small) part of the student grades was contributed by completion, and successfulness of a weekly quiz (or survey). After the submission of the two writing-based, report-style assignments, a questionnaire/survey was delivered to the students, as one of their weekly graded quizzes, to gauge their feelings and attitudes towards the courses’ writing assessments and the grace period policies associated with the writing assessments in the course. A 0.5% incentive was awarded for completing the survey, although this incentive did not require students to agree to share

their data for this study. This protocol was approved by the university's Research Ethics Board (Protocol #44176), and the sample size reported reflects the number of students who gave permission for their data to be used, across all sections of the course in Fall of 2022; in total, 437 students were enrolled in the course across the study period at the end of the semester, of which 318 (73%) consented to participate and completed the survey.

In this paper we will investigate the usage of the grace period on both assignments and students' opinions and attitudes. On the first question of the survey students were specifically asked *Which of the following best describes your experience with the Assignment 1 and Assignment 2 one week grace periods in STA304 Fall 2022?* and would select from the following four options: (1) *I used the grace period for Assignment 1, but not Assignment 2.*; (2) *I used the grace period for Assignment 2, but not Assignment 1.*; (3) *I used the grace period for both Assignment 1 and Assignment 2.*; and (4) *I did not know about or use the grace periods.* Immediately following the question on usage of the grace period, students were asked about their feelings regarding the grace period. Specifically, question two of the survey asked: *Which of the following best describes your experience regarding the one-week grace periods for Assignments 1 & 2 in STA304?* and students would select from the following three options: (1) *I am happy that there was a one-week grace period available for both assignments*; (2) *I feel indifferent of the one-week grace period being available for the assignments*; and (3) *I disliked that there was a one-week grace period available for the assignments.* In addition to these questions, the lecture section students were enrolled in was also recorded.

Statistical Analysis

In order to analyze these survey results to best investigate the usage of the flexible late policy and attitudes regarding the late policy summary statistics, specifically counts and percentages, were calculated for the questions of interest. In order to investigate usage of the grace period of students in the class the counts of the selected options in question one were tabulated for students in each of the two lecture sections, as well as the total number of students in each lecture section and the overall students' usage of the grace period for the entire class. The conditional percentages were calculated based on the lecture section students were enrolled in was also tabulated, in order to investigate if there is inconsistent usage of the grace periods across the two different lecture sections. In order to investigate students' feelings about the grace period the counts of the selected options in question two, of the survey, were tabulated, based on the usage of the grace period. The total number of students who selected each option in question two, based on whether they did not use the grace period, used the grace period for one assignment, or used the grace for both assignments was calculate, as well as the overall number of students who selected each option for questions two of the survey for the entire class. The conditional percentages were calculated based on the usage of the grace period (i.e., total of each of option for question 1), in order to investigate if there is inconsistent feelings toward the grace period based on whether or not the students actually used the grace period.

RESULTS

The purpose of this study is to investigate the usage of the flexible late policy within the course, relay student attitudes regarding the late policy, offered for report style, statistical communication assessments.

Table 1 showcases the frequency and percentage of students, within the study, who had used the grace period offered within the flexible late policy on Assignment 1 and Assignment 2, across the two lecture sections in the course. In this table we can see that the usage of the grace period for Assignment 1 only, Assignment 2 only, both assignments or neither assignment seems to be similar across the two different lecture sections. Moreover, we can see that 264 (83%), out of the 318 students in the study, had used the grace period on both Assignment 1 and Assignment 2. Additionally, 310 students (97%), out of the 318 students in the study, had used the grace period on either Assignment 1 or Assignment 2, or both.

Table 1. Frequency (and percentage) of usage of the grace period on Assignment 1 and Assignment 2 across the different lecture sections

		Neither	Only Assignment 1	Only Assignment 2	Both Assignment 1 and Assignment 2	Total
Section 1	Count(%)	6(4)	6(4)	19(11)	133(81)	164(100)
Section 2	Count(%)	2(1)	9(6)	12(8)	131(85)	154(100)
Total	Count(%)	8(3)	15(5)	31(10)	264(83)	318(100)

Table 2 showcases the frequency and percentage of students' opinion of the grace period when prompted to respond if they were "happy that there was a one-week grace period available", "indifference of the one-week grace period" or "disliked the one week grace period". Specifically, the data is further sorted based on the students' usage of the grace period, i.e., whether they did not use the grace period available for either assignment, whether they used the grace period on only Assignment 1 or Assignment 2, or whether they used the grace period on both Assignment 1 and Assignment 2. In this table we can see that overall, 313 (98%) out of 318 students were happy that the grace period was available on both assignments. Moreover only 1 (0%) of students disliked the grace period and 4 (1%) were indifferent. Additionally, the table demonstrates that usage of the grace period in any way (i.e., only Assignment 1, only Assignment 2, or both assignments) yielded higher rates of happiness, than those students that did not use either grace period. But notice that the rate of students who were happy is still fairly high in the group that did not use the grace period, namely, that 5 (63%) out of these 8 students still reported being happy that the grace period was available and the rest being indifferent, since 0 (0%) of them disliking the grace period.

Table 2. Frequency (and percentage) of opinion of the grace period, based on the distribution of usage of the grace period on Assignment 1 and Assignment 2

			Disliked grace period	Indifferent about grace period	Happy grace period was available	Total
Usage of grace period	Neither	Count(%)	0(0)	3(9)	5(63)	8(100)
	Assignment 1 Only	Count(%)	1(1)	0(0)	14(93)	15(100)
	Assignment 2 Only	Count(%)	0(0)	1(3)	30(97)	31(100)
	Both Assignment 1 & Assignment 2	Count(%)	0(0)	0(0)	264(100)	264(100)
	Total	Count(%)	1(0)	4(1)	313(98)	318(100)

DISCUSSION

Overview

With stress levels of post-secondary students being on the rise, it is important to appropriately design assessments in order to ensure that we are supporting statistics students, who often have anxiety around writing and communication. This paper discussed the implementation of a flexible late policy, with no grade penalty, applied to writing assignments of a large third year statistics, undergraduate course. This was done via student feedback provided in a survey taken at the end of the semester following completion the two assignments, for which the grace period was available. The paper investigated the usage of the flexible late policy across two different assignments and students' feelings about the availability of the late policy on both assignments. Results show that 310 (97%) of students in the course used the grace period on at least one assignment, and that 264 (83%) used it on both assignments. Results showed that usage of the grace period was consistent across both lecture sections in the course. Additionally, results show that 313 (98%) of the students in the study were happy that the grace period was available for both writing assignments. Moreover, students who did not use the grace period tended to have higher rates of indifference than the students who had used the

grace period. For those students who had used the grace period on both assignments, 100% of them reported that they were happy with the grace period being available.

Limitations

This study builds on the work of previous scholars by shedding light on the use of a flexible grace period in supporting students in their comfortability in creating and submitting written communication reports. Further research is warranted to not only understand and learn from the experiences of teachers and learners in the context of this study but also, as our research has highlighted, to support communication skill development in large undergraduate statistics and data sciences (as well as other STEM) courses. Specifically, additional research is needed to understand the experiences of university students studying at institutions in which they are language minorities or may have learning needs regarding communication.

It is also worthwhile to note that only some aspects of the data collected, both in the course and in the survey, were either not collected for this study or were not considered for analysis in this article. Specifically, the researchers had requested ethics approval on a survey regarding tasks and assessments that were closely linked to student report-style writing assessments in the course. There were other assessments in the course, including the midterm test, in-class polls, weekly quizzes, and the final exam. Additionally, there were also, ungraded, communication components of the course, including the anonymous, ungraded discussion board (Piazza), weekly TA office hours, lecture activities and interactions with the course website, that may support students' statistical literacy, but were not asked about in the survey included in this study. Although these components may be of interest for future studies, the researchers were not directly interested in them as they did not directly relate to the flexible grace period. Additionally, there were other questions in the survey in which data was collected on the students regarding the assignments and grace period. These data collected from these other questions were not directly tied to the usage and student feelings regarding the grace period, and thus were left out as they did not directly align with the research questions investigated in this paper. Thus, future projects may also consider including more survey questions regarding other course components involving communication. Additionally, future work may dive deeper in to student feedback regarding the grace period and this would be further investigated using the student answers to the other survey questions collected.

Another limitation to consider is the generalizability of this particular study. One must remember that the data was collected on students from a specific course that is fairly unique. Specifically, the course itself is from a large Canadian public research university, thus the statistics program and class sizes (approximately 500 students per semester) across all semesters are fairly large and uncommon when comparing to other institutes. Thus, it is important to emphasize that findings of this paper are viewed at from a global perspective, as opposed to on a granular level. Beyond this the course was provided additional support to hire a specialized ELL/WIT-trained TA who would specialize in developing materials for students, offering workshops and supporting TA benchmarking while grading written work. Having a TA with this skillset is uncommon in statistics courses. Thus, it is recommended to consider looking into similar training availability at your local institution prior to trying to mimic the assessments and/or grace period considered in this study. Thus, again, it is recommended that researchers consider the findings of this study from a global level, as opposed to a granular approach, and to be mindful of potential limitations (i.e., financial restrictions) if intending to design a course (or research study) similar to the one described in this paper.

Recommendations

Again, the results of this study showed a high usage rate of the flexible grace period and high happiness rate regarding the grace period. Namely, 97% of students in the study used the grace period on at least one assignment, and 98% of the students in the study were happy that the grace period was available for both writing assignments. Additionally, the development of the grace period was designed and implemented in order to reduce the administrative workload of the course instructor and TAs. Thus, the grace period was well received by both the students and the teaching team. So, I would recommend that instructors of large classes consider invoking a flexible grace period policy on large writing assessments in statistics (or other STEM) courses.

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