

Students' perception of performance before and after exams In a Surveying Course

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Abstract

Many educational institutions, at all levels, impute significant weight to examinations as they assess the overall performance of students in a course or program. Therefore it is important that students are adequately prepared in order to excel in examinations. A student's level of confidence in their ability to ace an exam, before, during and after the exam could be the same or could be very different at each of these three stages. Summary statistics show that students perceptions of their exam performance is highest before the exam (86.3%) and reduces by an average of four (4) percentage points after the exam. However, students are able to predict their actual exam grade significantly well after the exam as the average of the actual student grade (82.5%) was almost the same as the students' predicted performance after the exam (82.3%).

Keywords

Grade Perception Grade Prediction Exam Readiness Exam Preparedness Surveying

Introduction

Examinations are a key component of the overall assessment of student learning. However, a study by Bogale and Shiber¹ reported that 77% of 180 surveyed faculty did not agree that exams should be the only measure to determine student grades. On the other hand, 98% of 975 surveyed students agreed that exams should be the only determinant of a student's grade. Notwithstanding, many educational institutions, at all levels, continue to impute significant weight to examinations as they assess the overall performance of students in a course or program. Therefore it is important that students are adequately prepared by instructors or professors and fully equipped with all the tools they need to be confident in their ability to excel in examinations. A daily challenge facing teachers, instructors, professors and educators alike is how to motivate students to be proactive in their own learning and studies. If students could have an idea of how well or how poorly they would perform on an exam, based on their level of preparedness, they would undoubtedly be more fueled to pace themselves and strategize better on how to prepare for an exam and be ready for it. A student's level of confidence in their ability to ace an exam, before, during and after the exam could be the same or could be very different at each of these three stages. This paper does a comparative study on students' perception of their exam performance before an exam and their predicted performance after an exam as compared to their actual score obtained in a surveying course.

Student preparation for exams and perception of exam grades

How should students prepare for exams? This age old question is almost impossible to fully answer. Each student is different and would have their own learning style and metacognitive processes. Also, the nature of the course could influence students in choosing one study technique or resource over another. A study by Wade et al² looked at study habits of students in a thermodynamics course and concluded that students who obtained an A in the class utilized the course workbook to study for exams more than any other group of students while students that scored a C in exams reviewed old tests more than any other group. This study highlighted that the use of the course workbook for exam preparation would be a better tool than going over old tests but will that be the case for another course that is structurally dissimilar from a thermodynamics course? The authors believe the answer is not clear cut.

A paper by Meredith surveyed students to know what areas from the course learning objectives they were not confident on being tested on³. This I believe could be very beneficial to students to know what areas they are weak in before the test and this would help with their approach to studying for the test. Yet again, there is no one-mold-fits-all solution for test preparation and how does the student actually know that they are adequately prepared to attain a desired grade in a test? There is limited literature on student perception of desired and perceived exams grades especially immediately before the exam. A few studies have looked at certain aspects of exams using post-exam surveys and analysis. One such study was conducted by Adhi and Aly⁴ on a cohort of medical student to find the difference between the two commonly used types of multiple choice questions (MCQs): One-Correct and One-Best. Adhi and Aly's research concluded that although the exam scores were higher for the test in the One-Best MCQ format, students did not find that format favorable over the One-Correct format. The sparse nature of education research that focus on investigating possible student performance prior to exams is one of the motivators in conducting this research. It is envisioned that when students are able to predict their own exam performance based on their preparedness, they would be able to study more effectively

Survey Data

Data collection was done with the consent of students after the approval of the institutional review board (IRB) at the Citadel. The data collection semesters were Fall 2017, Fall 2018 and Fall 2019. There were two sections of the course taught each semester with an average of 24 students per section. The survey data was collected on exam days where students were given a questionnaire before the exam to provide responses to three (3) questions:

- A. Approximately, how many hours did you spend studying for this exam?
- B. Indicate below your level of preparedness for this exam (Circle one)
1-(Very Unprepared) 2-(Unprepared) 3-(Not Sure) 4-(Prepared) 5-(Very Prepared)
- C. After studying for this exam, how many points (out of 100) do you expect to earn?

After the exam but before leaving the exam room, students were asked to provide a response to a fourth question:

D. After completing the exam, how many points (out of 100) do you think you have earned?

To complete the data collection, the exam grade for each student was added to the tabulated survey responses they provided. There were three 50-minute module exams during the semester and a comprehensive final exam at the end of the semester. A sample of the tabulated data collected is shown in Table 1.

Table 1 – Sample Student Survey Data

Module Exam 1					
Student ID	Hours Studied	Level of Preparedness for Exam	Perceived Score Before Exam	Perceived Score After Exam	Actual Exam Score
1	2.0	Prepared (4)	80.0	75.0	72.5
2	2.0	Prepared (4)	95.0	86.0	91.0
3	2.0	Very Prepared (5)	88.0	88.0	90.0
4	2.0	Not Sure (3)	95.0	70.0	61.5
5	3.0	Prepared (4)	85.0	80.0	72.5
6	0.5	Prepared (4)	90.0	95.0	97.0
7	0.5	Unprepared (2)	75.0	75.0	83.0

Results - Data Statistics and Trends

The collected datasets were first analyzed by course section and by year. The data was then combined to have a larger sample size to extract statistics for the entire sample. Overall summary statistics were obtained for all 4 exams. Summary statistics show that students perceptions of their exam performance is highest before the exam (86.3%) and reduces by an average of four (4) percentage points after the exam. Also, on average students reported to be prepared for the exam regardless of how much time they spent studying. However, students who studied 2 hours or over 3 hours felt more prepared than students who studied 1 hour or less. It is interesting to note that the 2 hour study period contained the median score for the exam. The kurtosis and skewness measures obtained from the descriptive statistics of the analysis data suggested that all three scores (perceived score before the exam, predicted score after the exam and the actual exam score) show a normally distributed dataset. Hence, mean values were used for analysis since normality suggests that there were few outliers if any in the dataset.

Figure 1 shows the mean exam scores from the student surveys (perceived score before the exam and predicted score after the exam) and the actual exam scores grouped by hours studied. The

module exams are 50 minutes exams and covers roughly four (4) weeks of course material. In this figure, the final exam data was not used. This is due to the fact that the final exams and module exams differ in variables such as length of exam (50 minutes – module, 2.5 hours - final), amount of material covered and study time available to students for review before the exam and therefore would not be representative of the 3 module exams in comparison. The main trend seen from Figure 1 is that, except the students that studied less than 1 hour, most students were very optimistic and confident in their ability to do well on the exam before the exam starts. However, after the exam their predicted score is roughly 4 points lower than perceived at the beginning of the exam. For this same group of students, their actual exam score is even lower than what they predicted after the exam.

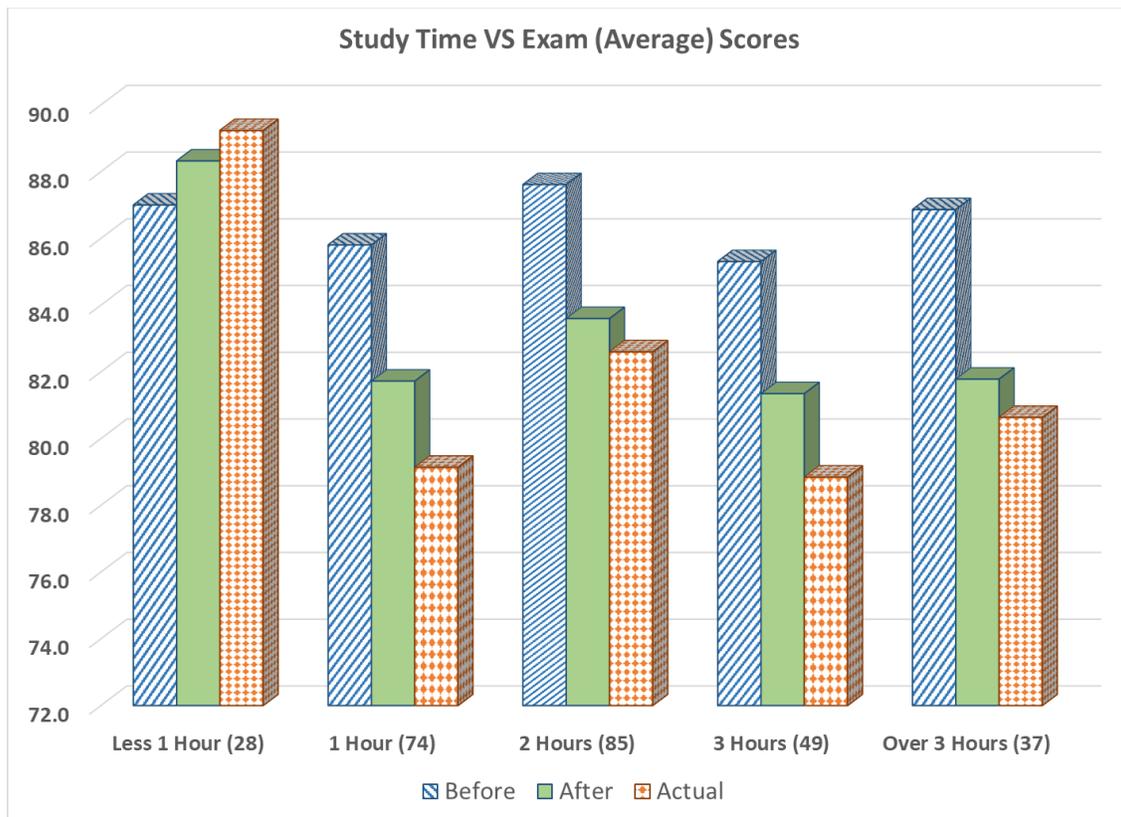


Figure 1 – Average scores grouped by hours studied

The trend seen in the average student is opposite for the group of students that study less than 1 hour. These students tend to predict an even higher exam score after completing the exam and actually scoring higher than their predicted score. The trends observed in Figure 1 are interesting, in that contrary to common knowledge, it could be taken to suggest that students should study less to perform better in exams. However, upon close observation, most of the students who fall within this study time overall were the higher performing students who were head and shoulders above the average student and therefore needed very little time to prepare for exams in general. The 2 hour study time group had the highest exam score apart from the group containing the high performing students. This suggests that the average student should study roughly 2 hours for a similar type of course to get optimum results.

A comparison of the student survey data and actual exam scores across all 4 exams was done and the results are shown in Figure 2. Although there are differences between the 4 exams, the common trend observed from the groupings in Figure 1 was also observed in Figure 2. Which is that students perceived that they would obtain a higher score before the exam compared to their predicted score after the exam and their actual exam score. This shows optimism before the exam which is a valuable trait but a misconception on how well they would do. Although the final exams and module exams differ in variables such as length of exam, amount of material covered and study time available to students for review before the exam, the figure shows a very similar pattern between module exam 3 and the final exam.

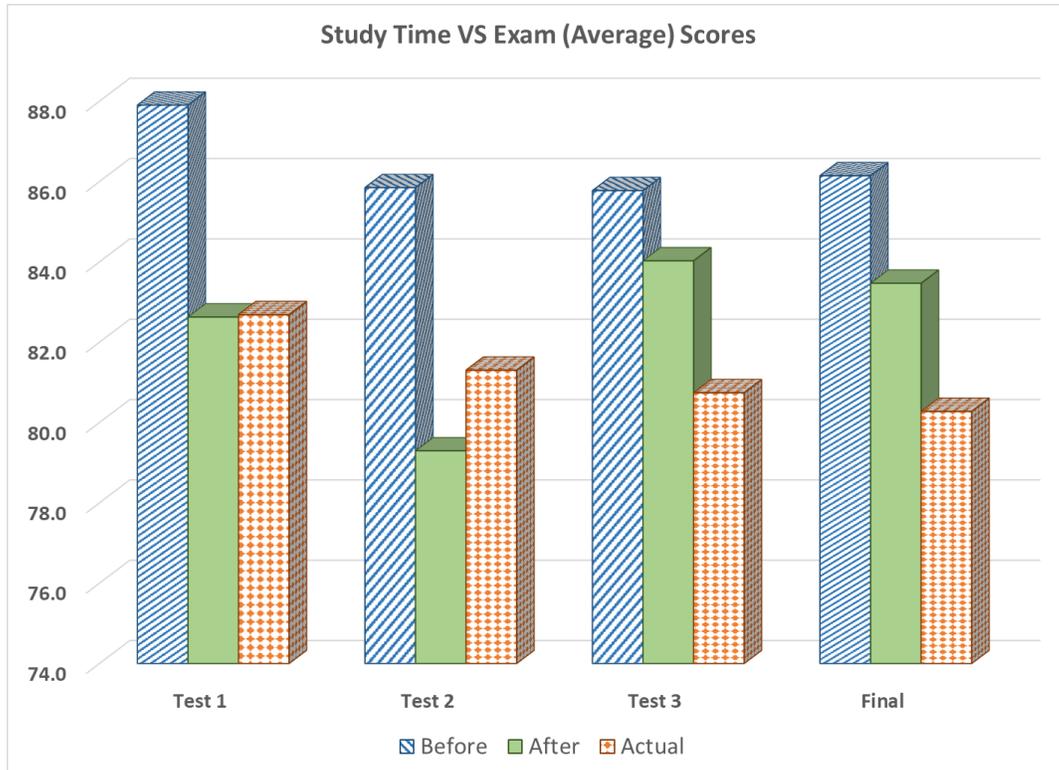


Figure 2 – Average scores of student responses and actual exam scores across all 4 exams

Module exam 1 and module exam 2 however have different trends. A few situations come to mind with the first two module exams with regards to the students' thinking and mindset. In module exam 1, majority of students would be in the phase of familiarizing themselves with various aspects of a new environment such as a new course with a new professor, the nature of course material, the tendencies of the professor with regards to grading, the difficulty of exams from that particular professor and many more. These could be potential reasons for the difference in trends. However, students would be familiar with all the aforementioned variables by the third module exam and the final course exam to be consistent in their predictions and perceptions of their grade.

Further investigation into the exam score predictive prowess of students was done using simple regression analysis for all data points in the dataset. The results of the regression analysis is shown in Table 2. The dependent variable for the regression model was the actual exam score

while the independent (predictive) variables were the hours studied, the perceived score before the exam and the predicted score after the exam. The R-Squared value for the model was 0.46 which shows that model does have some predictive capabilities

Table 2 – Regression Model Results

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	7.05	5.145	1.371	0.171
Hours Studied	0.110	0.369	0.299	0.765
Perceived Score Before The Exam	0.155	0.069	2.228	0.027
Predicted Score After The Exam	0.748	0.061	12.187	9.8E-29

The regression results suggest that the student’s predicted exam score is the most significant contributor in predicting their own exam score in this model. This shows that student have a reasonably good estimate of how well they did on an exam. This can be further extrapolated to deduce that students actually know what it takes to do well on a given exam.

Another measure of the predictive prowess of students is shown in Figure 3. It can be seen that approximately 48% of students and 65% of students can predict their exam score within 5 and 7.5 points respectively of their actual exam score.

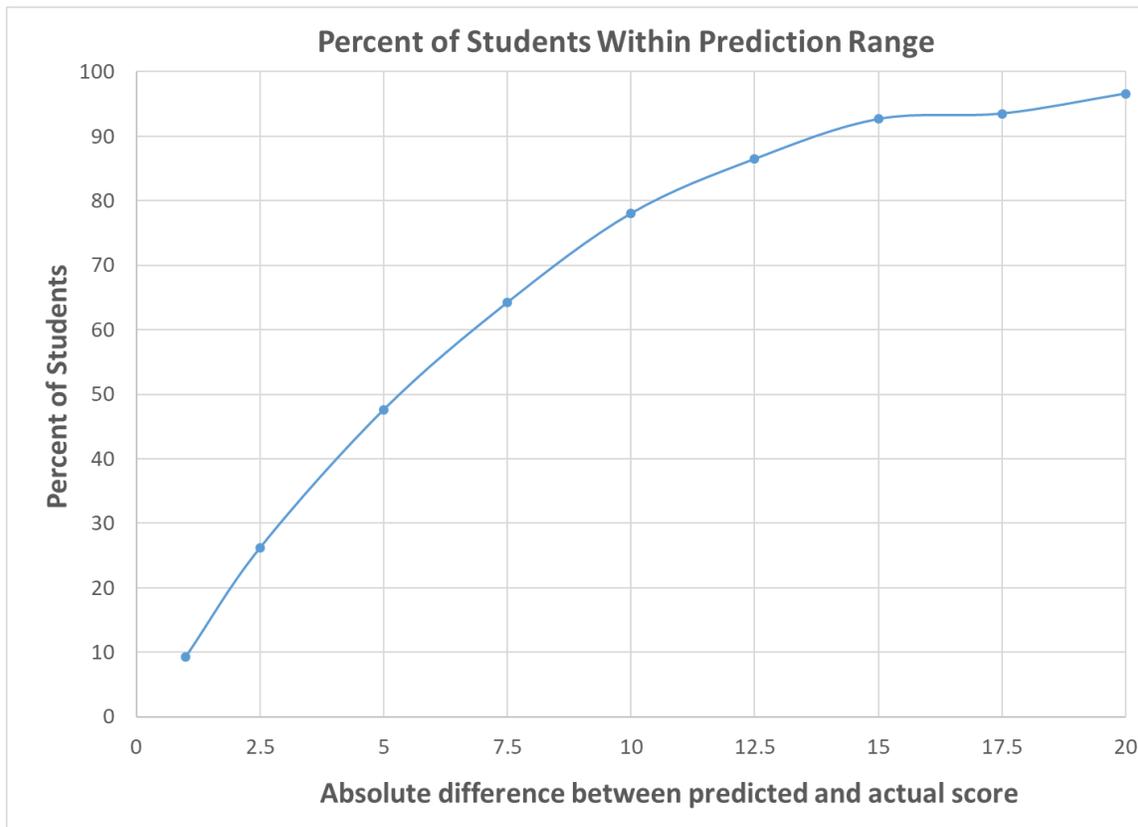


Figure 3 – Percentage of students by absolute difference in students’ predicted and actual scores

Conclusion

The research data statistics and trends shown in the previous section, indicate an inherent ability of a majority (approximately 80% from Figure 3) students to predict their exam score within 10 points of their actual grade. This indicates that a majority of students can reasonably predict their letter grade even though they might be a few percentage points higher or lower in predicting the actual score. This is particularly true for students' predictions after the exam but not as strong of a correlation for perceived scores before the exam and the actual exam score.

Also, it is anticipated that the students would gain familiarity with certain characteristics about the professor and the exams over the course of the semester. Specifically, the students would be more familiar with the professor and his or her tendencies on grading. The students would also be familiar with the exam format and difficulty of a typical exam from that professor by the third and final exam hence this could possibly contribute to the change in predictive patterns between exams over the course of the semester.

This research shows that for the average student, two (2) hours of studying and preparing for a 50 minute exam in a surveying course would optimize their ability to do well in the exam. It is envisioned that when students are able to predict their own exam performance based on their preparedness, they would be able to study more effectively for subsequent exams using the experience gained in their predicted performances from previous exams.

References

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