Students Eager to Use an EXCEL-Based Tool to Boost Their Grades

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Abstract

A simple Excel based program was developed to assess various ABET criteria in courses. This program also processes the numerical grades of students during a semester which greatly smoothens the processing of mid-semester and semester-end grades by the instructors as well as it helps keep track of progress of students at any time during a semester. A shorter version was made available to students to keep record of their own grades. As a grade is entered into the program, it instantly shows the current standing in the class in terms of corresponding letter grade. The program predicts final grade based on future tests and homework grades. This allows students to budget their efforts to earn their desired grades. This version was distributed to some students in Spring 2004 semester to keep track of their own performances during the semester. The verbal response obtained from the students was encouraging. During Fall 2004 semester, the same program with a short survey questionnaire were distributed to the students in two courses. The instrument was designed to obtain unbiased responses from the students. The major focus of the survey was to determine the quantitative impact of the program on the performance enhancement of the students. The other focus areas were the frequency of use of the program and self-assessment in allocating efforts to achieve a desired grade. The questionnaires were collected at the end of the semester for analysis.

Introduction

An instructor uses various measures to assess the performance of students in a semester such as homework, pop quizzes, mid-semester tests and final examination each with varying weights. The final numerical score is computed based on the weight distributions among the measuring

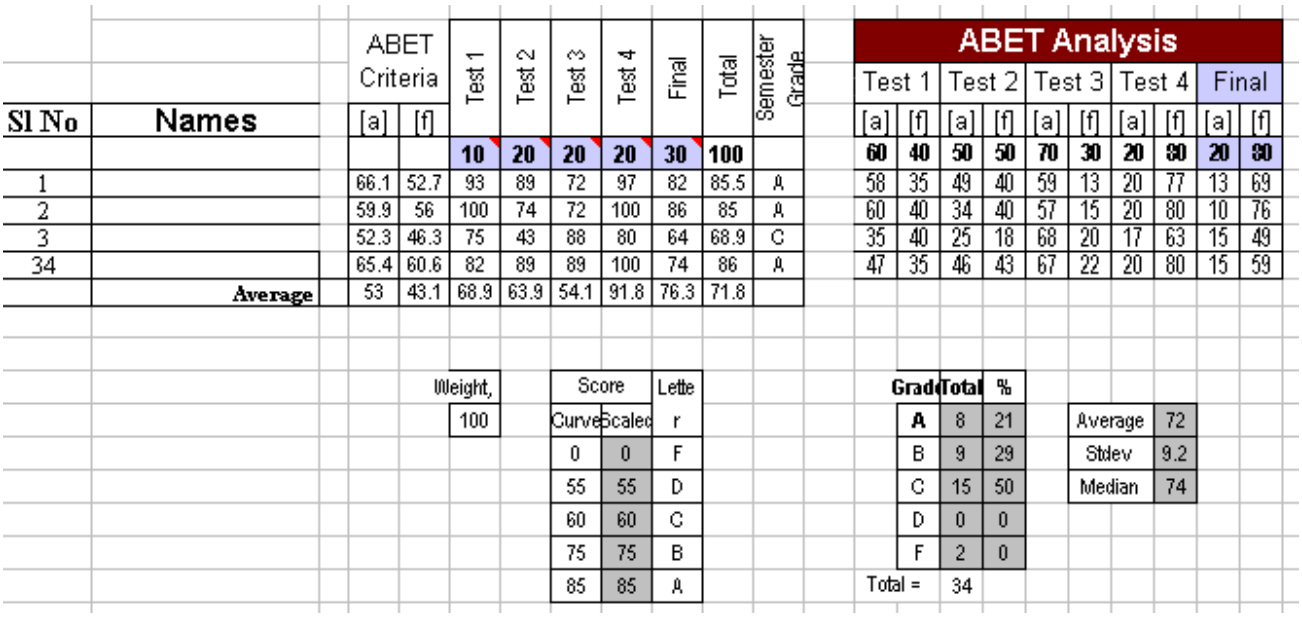
components. The numerical scores are later converted to letter grades as the final grades for the students. This used to be a cumbersome process done by the instructors until the advent of the Microsoft Excel or some commercial software. Appropriate programming of the Excel spreadsheet automates the extra analysis needed for ABET criteria as well. The students without a programmed Excel spreadsheet in hands may not predict status of their own grades during a semester. It is likely that a student makes a numerical score closer to 100 in one measure and not too well in the other measure. Making good scores in all measures gives comfort to the students. However, doing not so well in a measure may be the reasons to lose confidence in improving in other measures to still make a better grade in the course. Multiple measures in a course make this problem more complicated for the students.

Until now there is no known software available for students to monitor their own progress during a semester. Microsoft Excel allows developing efficient utility programs as needed. Sarker and Ketkar [1] described a detailed method of developing EXCEL spreadsheet to process raw grades from various measures in a class. They also showed how to develop a shorter version for students to use to monitor their own progress in a course. This shorter version was distributed to students in Spring 2004. The students reported the advantage of its use. In 2004 Fall, the same program was distributed to two classes with a questionnaire. This paper discusses the responses on the impact of the use of this program.

Method

The program in diskettes was distributed to the students of two classes at the beginning of the Fall 2004 semester. The names of the courses are, a) Microprocessor Assembly Language, and b) Software Engineering-I with enrollments of 34 and 14 respectively. An advanced copy of a questionnaire was distributed to help them understand the intention of the survey. The same questionnaire was distributed again to those who were present (34 from two classes) at the end of the semester to collect their responses.

An extract of a sample spreadsheet used by an instructor is shown in Figure 1. This shows the raw numerical score distribution of various tests. Each score is further shown broken as per two ABET criteria under the highlighted caption, "ABET Analysis." The tests, test 1, test 2, test 3, test 4 and final test results were pooled down under varying weights of 10, 20, 20, 20 and 30 percents respectively. The column "ABET Criteria" shows the weighted averages for the individual students. The class totals and corresponding letter grades are computed as well.



Sl No	Names	ABET Criteria [a]	ABET Criteria [f]	Test 1	Test 2	Test 3	Test 4	Final	Total	Semester Grade
				10	20	20	20	30	100	
1		66.1	52.7	93	89	72	97	82	85.5	A
2		59.9	56	100	74	72	100	86	85	A
3		52.3	46.3	75	43	88	80	64	68.9	C
34		65.4	60.6	82	89	89	100	74	86	A
	Average	53	43.1	68.9	63.9	54.1	91.8	76.3	71.8	

ABET Analysis									
Test 1		Test 2		Test 3		Test 4		Final	
[a]	[f]	[a]	[f]	[a]	[f]	[a]	[f]	[a]	[f]
60	40	50	50	70	30	20	80	20	80
58	35	49	40	59	13	20	77	13	69
60	40	34	40	57	15	20	80	10	76
35	40	25	18	68	20	17	63	15	49
47	35	46	43	67	22	20	80	15	59

Weight,
100

Score		Letter
Curve	Scaled	
0	0	F
55	55	D
60	60	C
75	75	B
85	85	A

Grade	Total	%
A	8	21
B	9	29
C	15	50
D	0	0
F	2	0
Total =	34	

Average	72
Stdev	9.2
Median	74

Figure 1 A section of a spreadsheet used by an instructor for automatic processing of grades.

The student version of the above spreadsheet is shown in Figure 2. In this paper, this file is referred to as "instantGrade" file. In the Figure, 'abc' and 'xyz' are some fictitious student names. A student can put his/her name in one cell and keep the other vacant or can use the second line for another course with similar weight distribution. A student has to do two things with this file, viz, a) enter grades in the white cell as obtained from the instructor, and b) update the blue cell with their weights. The weights automatically show up as the cursor is pulled over these cells. The following changes take place after the score and the corresponding weight cells are updated:

- The cell under column 'Total' is updated
- Student's current total score under column 'Total' is updated
- The corresponding letter grade under column 'Letter Grade' is updated
- The percentage of test measures covered thus far appears under column, 'Weight%' and the corresponding numerical score appears in the third column of that block in the Figure. These are the minimum scores needed for certain letter grades.

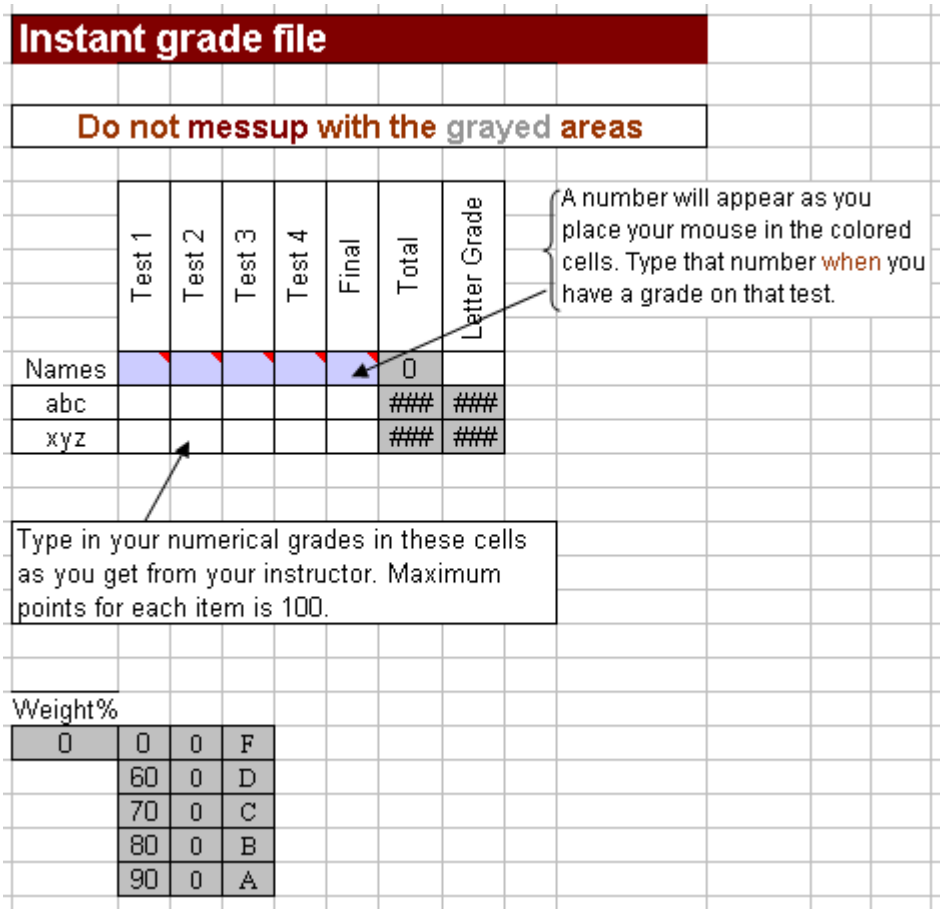
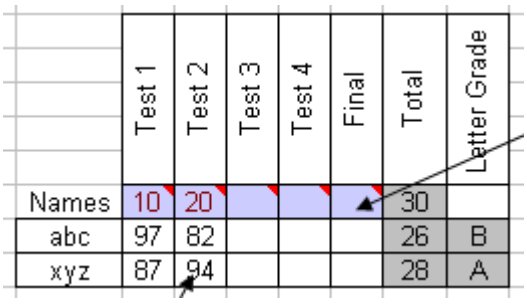


Figure 2 The instantGrade file for students to monitor their performance during a semester

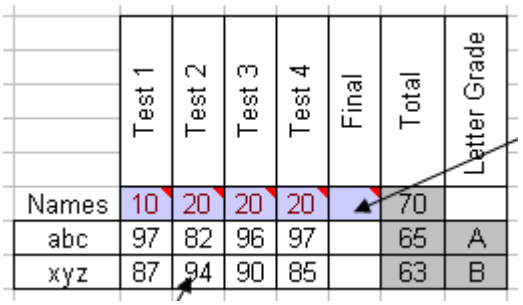
Figure 3 shows some fictitious scores with corresponding status of two students after 30 % and 70 % of the tests are covered respectively. As in Figure 3a, the student 'abc' seemed to be relaxing after obtaining 97 in Test 1. This caused him to make only 82 in Test 2 with an average standing gone down to B while the student 'xyz' seemed to have a warning and thus she enhanced her grade from B to A. The instantGrade file may act as a wakeup call. As in Figure 3b, the student 'abc' kept hard working and thus his score went up to make an A after 70 % of the course materials were covered. But the student 'xyz' seemed to relax after attaining an average of A after test 2 which caused her grade to go down to B at the same time.

At this point, the students were yet to take the final test worth 30 points. The students could play with some numerical scores for the final exam to find out how much numerical score is needed to make A or B etc.



	Test 1	Test 2	Test 3	Test 4	Final	Total	Letter Grade
Names	10	20				30	
abc	97	82				26	B
xyz	87	94				28	A

a) 30 % of the course is covered



	Test 1	Test 2	Test 3	Test 4	Final	Total	Letter Grade
Names	10	20	20	20		70	
abc	97	82	96	97		65	A
xyz	87	94	90	85		63	B

b) 70% of the course is covered

Figure 3 Some fictitious scores are entered in to the file to show letter grades at two specific instances during the semester.

The student 'abc' has some extra points over the scale of 90. A little trial will show that he needs only 83% as minimum in the final test to make an A in the course. Thus he has flexibility to divert some effort to better prepare for other courses. But the student 'xyz' needs to make a minimum of 92% in order to make an A. However, to make a B, she needs a minimum of as low as 59% only in the final test.

The response of students on the effectiveness of the instantGrade file was collected using a simple questionnaire with two sections. The first section had questions to assess the intensity of use of the instantGrade file. The second section had questions to assess the impact of the file in enhancing the grades of students.

Results and Discussion

The instantGrade file was distributed to students during the spring semester of 2004 to obtain its impact of student performance. Many students came forward to express its advantage in budgeting their time and effort and finally obtaining desired grades. This encouraging response from the students, in fact, was the reason for conducting an actual survey on students of two classes in fall semester of 2004. At the end of the semester, 34 questionnaires were distributed to two classes. A total of 29 students responded. Three responses were discarded due to inconsistent entries. Thus the analysis was made based on 26 respondents. The survey sheet and responses are shown in Figure 4. The responses from the students are presented in the form of weighted averages and bar charts. No statistical analysis was performed due to the small sample size.

Nearly half of the sample entered all mid-semester grades on a regular basis. Ninety four percent of the sample consulted the file in varying degrees to track their own performance status during the semester. Therefore, their overall response to the advantage of the file varied widely. Those, who did not do the best use of the file, did not agree well that the file helped them improve the chance of getting better grades. About 26 percent of the students consulted the file very regularly; they were found to agree on the benefit of the file.

Cosolidated Survey on instantGrade file

Number of quesionnaires distributed 34
Number of students responded 29

Part A	Never	Few	All
1. Entered Mid semester grades in the instantGrade file	0	14	12
2. Consulted the instantGrade file during the semester	0	19	7

Part B	Not Agreed				Agreed Strongly
	1	2	3	4	5
3. The file helped improve my mid semester grades	2	3	8	7	6
4. The file helped assess my own seriousness for the final	0	3	2	9	12
5. The file helped me get my desired grade in the course	4	1	9	4	8

Analysis

Part A	Never	Few	All
1. Entered Mid semester grades in the instantGrade file	0.00	48.28	41.38
2. Consulted the instantGrade file during the semester	0.00	65.52	24.138

Part B	Not Agreed				Agreed Strongly	Average
	1	2	3	4	5	
B.. The file helped improve my mid semester grades	6.90	10.34	27.59	24.14	20.69	3.10
B.4 The file helped assess my own seriousness for the final	0.00	10.34	6.90	31.03	41.38	3.72
B.5 The file helped me get my desired grade in the course	13.79	3.45	31.03	13.79	27.59	3.07

Figure 4. Survey instruments with response analysis

Figure 5 shows the impact of the file on preparation for tests. All agreed that the file helped them prepare for tests. About 44% of the students strongly agreed that the file helped them budget their time and effort set aside for test preparation. In a scale of 1 - 5, the agreement average was 4.0.

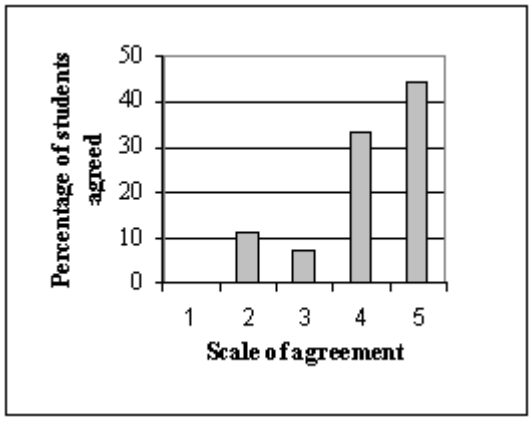


Figure 5 Help in preparing for tests

Figure 6 shows the impact on the improvement of mid-semester grades. The response is distributed across the response scale. However, there is a distinct pattern of a skew to the right which means that the majority tend to agree that the file really helped them improve their mid-semester grades. In a scale of 1-5, the agreement was 3.33. The disagreements as revealed in the Figure 6 are mostly due to the fact that some students did not consult the file on a regular basis.

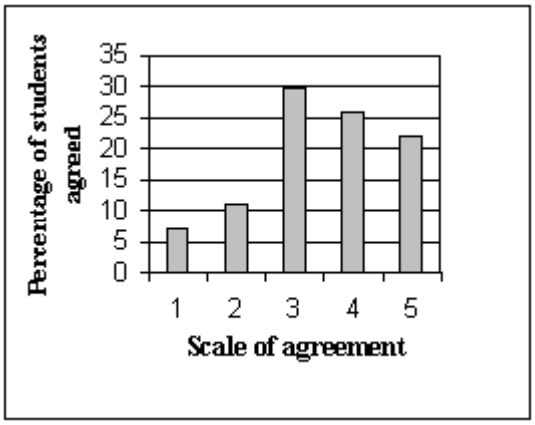


Figure 6 Responses to improvement of grades

Figure 7 shows how the file helped in obtaining the desired grades for the semester. About 30% students agreed very strongly that the file helped them obtain their desired grades while as many as 15% did not agree at all. A group of 33% students opined exactly at the middle of the scale.

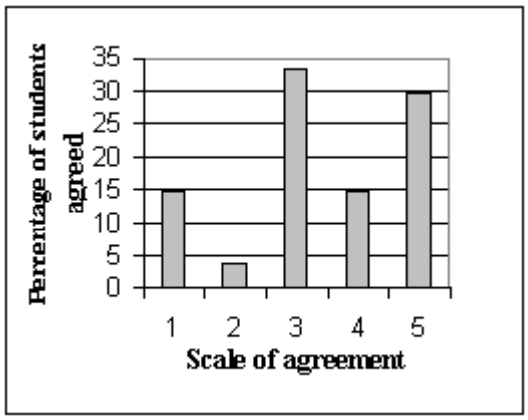


Figure 7 Helped in achieving desired grades

Figure 7 does not demonstrate very clearly the impact of the file on enhancing the grades of the students because many students did not consult the file quite regularly. A closer look over all the Figures collectively shows that the file really helped the students in achieving their desired grades. It clearly helped those who consulted the file to assess their own preparedness for the tests. About 46% of the students entered all mid-semester grades and 27% students utilized the file regularly and seriously. As a result and as evident from Figures 5, 6, and 7, 44% of the students strongly agreed that the file helped them become serious about the final test. Twenty two students strongly agreed that the file helped them improve their mid-semester grades and 30% students strongly agreed that the file helped them obtain their desired grades.

Conclusions

A Microsoft Excel file was developed for students to process their own scores during a semester with an intention to boost their performance. An initial trial of the file in Spring of 2004 shows encouraging responses from the students. This file along with a questionnaire was distributed to the students in Fall 2004.

Many students used this file less frequently and as a result they could not find its impact on their performance. However, those students who used this file on a regular basis strongly agreed that this file really helped them to obtain desired grades in the semester. The result found in this survey strongly suggests the use of the instantGrade file to help improve the students' learning process and to enhance their grades.

References

1. Sarker, N. N. and M. A. Ketkar. Automating grading system for faculty and students. Proc. of ASEE 2004 Gulf-Southwest Section Conference, March 10-12, 2004, Lubbock, Texas.

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