A Simple But Scary Mid-Semester Evaluation Instrument

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Abstract

This paper describes a mid-semester evaluation instrument used effectively for continuous improvement in a required sophomore course in electrical engineering. The instrument is simple in that it contains only six questions and takes no more than 10 minutes to complete. The instrument is scary in that the questions invite candid responses from students that might possibly injure an instructor's ego. After manually performing content analysis on the four open-ended questions in the survey, the instructor can obtain a clear picture of the strengths and weaknesses of the course. Results of surveys from two recent semesters demonstrate the value of this instrument.

Introduction

The goal of teaching is that students learn. This goal is never perfectly achieved, but is rather something toward which instructors continually strive. Moreover, this goal is not fixed, as students, technology, resources, and markets play an important role in determining both what and how students learn. Thus, a philosophy of continuous improvement in undergraduate education is vital to continued success in curriculum development [1]. A mid-semester course evaluation permits adjustments to the course before the course is completed.

The Evaluation Instrument

The evaluation instrument for Electronics I, a required sophomore electrical engineering course taught at New Mexico State University, has only six questions, three of which pertain to an accompanying laboratory. The laboratory makes up approximately one fourth of the student's grade and is mandatory for successful completion of the course. If a course does not have an accompanying laboratory, these two questions could be omitted. Alternately, these questions can be replaced with other ones focussing on another major component of the course, e.g., projects, homework, or recitations.

The six questions are:

1. Write one or more things about the laboratory that are good.
2. Write one or more things about the laboratory that need improvement.
3. Average number of hours spent per week on lab (including lab time).
4. Write two or more things about the class that are good.
5. Write two or more things about the class that need improvement.
6. Average number of hours spent per week on the class (including class time).

These six questions fill one side of a letter-sized piece of paper.

This instrument is based on one shown to me by Philip De Leon, an instructor of Digital Signal Processing at New Mexico State University [1]. Through several years of experience developing the instrument, I recommend the following guidelines in its use:

- The class size should be moderate to large, i.e., greater than 30 students. In that way, students will sense that it is very unlikely that the instructor could associate a particular response with a particular student.
- Let the instrument be a surprise. Administer it 1/2 to 2/3 of the way through the semester, after at least one exam and after the last day to withdraw from the class.
- Do the evaluation instrument during class time. The students will feel it is more important if the instructor is willing to give up lecture time. Moreover, the number of completed surveys will be much higher than if the instrument were given as a take-home assignment.
- Leave the room while they are taking it and have a student in the class collect them.
- For an even greater sense of security, have someone the students trust, such as a department secretary or student leader, type the written responses into a database and throw away the originals. In that way, someone's handwriting is not known.

Thus far, I have not followed the last guideline, as I sense that students trust me not to take personally any negative criticisms of the course.

Performing Content Analysis

It is recommended that you do not look at the student responses until approximately two days after the instrument was given. In addition, ensure that you are in a relaxed mood.

As you read through the responses, write categories for each comment the student has that pertains to some specific attribute of the course [3]. For every new comment, write a new category with one tick mark. For every comment similar to a category, tally another tick mark beside that category. Eventually, categories with five or more tick marks will emerge. These categories represent the major strengths and weaknesses of the course. Note that the larger the number of total responses, the more accurate the picture of strengths and weaknesses will become.

Results from Two Semesters

The evaluation instrument in the form described in this paper has been in use for two semesters at New Mexico State University in the course Electronics I. Table 1 will show a summary of results from Spring, 1999. The first column shows the top five major responses for each of the four open-ended questions, while the second column describes specific actions made by the instructor toward improvement the course. Table 2 will show a summary results from Fall, 1999. The first column is similar to that in Table 1, whereas the second column shows largely actions that can be taken only in its Spring, 2000 offering.

Discussion and Conclusions

A simple evaluation instrument has been effective for helping to continuously improve a sophomore electrical engineering course at New Mexico State University. This instrument can be scary since the questions invite candid responses from students. Results from two semesters demonstrate the effectiveness of the survey.

[1] ABET 2000 Criteria.
[2] Philip De Leon, personal communication, New Mexico State University, Fall, 1995.
[3] Linda Riley, personal communication, New Mexico State University, Fall, 1999.