TEACHING ELEMENTARY STATISTICS TO COMMUNITY COLLEGE STUDENTS IN AN INTRODUCTORY BUSINESS COURSE: A CASE EXERCISE

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Abstract

Community Colleges enroll 32% of all undergraduate students in the United States. Between 15% and 20% of all community college students choose to study business, management, and marketing. Because of the large numbers involved, it is imperative that the best pedagogies be used to help these students learn. Many community college students benefit from concrete, rather than abstract, learning opportunities. For this reason, the case method is particularly well suited for this population. This paper describes a case exercise which can be used to teach community college students elementary statistics, a typical concept in an Introduction to Business course. This case can be modified to accommodate beginning students in other educational contexts and in other countries.

KEY WORDS: community college students; Introduction to Business course; teaching elementary statistics; classroom exercise

INTRODUCTION

Cohen [2006] has previously described the rapid growth in community colleges, the distinctive characteristics of the community college population, and typical texts for the business major:

According to the Digest of Education Statistics 2004 [National Center for Education Statistics, Table 247], enrollment in community colleges has been growing at a faster rate than enrollment in four-year colleges, and now accounts for 32% of all undergraduate students. Between 15% and 20% of community college students choose to major in business, management, and marketing. [National Center for Educational Statistics, Table 248]. This means that in each year roughly 90,000 community college students take business courses.

THE COMMUNITY COLLEGE POPULATION

The American Association of Community Colleges (AACC) collects and disseminates data about the 1166 community colleges in the country. [American Association of Community Colleges] According to AACC, these colleges provide publicly funded educational opportunities in neighborhoods around the country. They are open to all, regardless of academic preparation, wealth, or family background. Relative to four-year colleges and private schools, their tuition is low, making them more affordable to students with low incomes. Many community colleges have transfer agreements with four-year colleges, whereby credits taken in the first two years at a community college are accepted toward a baccalaureate degree. This allows students with limited incomes to reduce the overall cost of a bachelor's degree. Almost 60% of community college students are women who find the convenient locations helpful in juggling parenting
responsibilities with schooling. Minority students make up around 30% of the student population. Classes in English as a second language attract new immigrants. Remedial courses allow students with limited academic preparation to enroll. More than 80% students work full or part-time; for them, flexible class times provide a real advantage.

TEXTS FOR THE BUSINESS MAJOR

The business major begins with an introductory course called something like Introduction to Business or Fundamentals of Business or Business Today. An informal survey of texts for this course shows that many texts introduce the student to the basic business functions: human resources, marketing, finance, and management information systems, to name just a few. The texts introduce concepts, give examples of applications, ask discussion questions, and provide summaries and reviews. Many texts supplement the readings with visual presentations on CDs and DVDs.

These videos help students who have difficulty understanding written materials.

Although many texts give examples of young managers at work, these examples are often remote from the experience of community college students. Many community college students are the first in their families to go to college. Because neither the students nor their parents have management experience, textbook examples are frequently divorced from the reality of these students' lives. Meaningful applications are ones that grow out of their own experience. This is where cases tailored to student lives can prove particularly effective.

THE TEXTBOOK PRESENTATION OF ELEMENTARY STATISTICS

In Business, 6th edition, by Pride, Hughes and Kapoor [Pride, Hughes and Kapoor], the authors devote one chapter to “Acquiring, Organizing and Using Information.” The authors introduce the concepts of information and risk, discuss differences between qualitative and quantitative research, and describe the reasons for implementing a company-wide management information system. They then mention methods for collecting data, analyzing data, and presenting information. Elementary statistics such as measures of central tendencies and frequency distributions are defined.

Definitions of elementary statistics may be sufficient for students in four-year colleges. However, this is not the case with community college students, who must take a course in remedial mathematics before starting their business studies. These students need to work with statistical concepts in order to understand them. Also, many want to know "what's in it for me" before making the effort to work with numbers. To engage these students, it is helpful to design a case study related to something they know and care about.

THE CASE EXERCISE

Like students everywhere, community college students do care about their grades. Since the chapter on management information systems usually comes near the end of the semester, students have probably already earned several grades on examinations, presentations and projects. These grades form the basis for the class exercise. (If the class is very small and students would be uncomfortable having their real grades revealed, you could use grades from another section. Normally, however, it is better to use the students' real grades.) Here is how the exercise works.

Step One
Lecture about elementary statistics: average, median, range, frequency distributions, bar charts and pie charts.

Step Two
Form groups of 2 - 3 students. Give each group real data about the students’ grades. See Exhibit 1 for an example from one of my classes.
Step Three
Ask each group to analyze the data by following the instructions on Exhibit 1.

Step Four
Discuss and interpret the findings. Is the average for each test “reasonable?” Is the range on each test “reasonable?” Is the distribution of each test “reasonable?” Are there any trends from test 1 to tests 2 and 3?

Step Five
Raise classroom management issues. What teaching and learning strategies can help students at the bottom? What teaching and learning strategies can help students at the top? What other recommendations do you suggest?

Step Six
Relate the exercise to the world of business. What data does a business ordinarily collect? Which functional managers would be interested in an analysis of the data? What management questions can be answered by analyzing company data? When is it appropriate to use bar charts and when is it appropriate to use pie charts?

Step Seven
For homework, ask students to research how statistics are used and presented in an annual report.

DISCUSSION
Case exercises have been used in the business classroom for decades in order to engage students in their own learning. Students are asked to make decisions and to defend their decisions. However, case studies that are too far removed from student experience lose some of their potency. Particularly for community college students with limited exposure to the world of management, cases need to grow out of their own experience. This case shows how to take a management topic and embed it in daily student life. Students relate to statistics when the data are their own grades. They are eager to see where they fall in the classroom distribution of grades, and they are often willing to give the professor suggestions for making the course more successful for both high and low achievers. This discussion leads naturally into the general topic of turning business data into useful information for managers. Asking students to examine how statistics are used and presented in annual reports helps reinforce and consolidate classroom learning.

Business and management students in other educational settings such as technical schools, vocational schools, and undergraduate colleges, and in other countries can use this case. More sophisticated statistics and the use of computerized statistical packages can be introduced to more advanced students. What is important is to tailor the case to the numerical skills and life experience of the class.

EXHIBIT 1

CLASSROOM EXERCISE: TURNING DATA INTO USEFUL INFORMATION
Actual Test Data from the Introduction to Business Class

Test 2

Test 3

Organize and analyze the data by test:

1. Order the data in a list from biggest to smallest.
2. Count how many items are in a list. \(n = ?\)
3. Find the total of a list. \(T = ?\)
4. Find the average of a list. \(T / n = ?\)
5. Find the median of a list. The median has half the items above it and half the items below it.
6. Find the range of a list. The biggest – smallest = ?
7. Group the data into categories
   A = 100 – 90
   B = 89 – 80
   C = 79 – 70
   D = 69 – 60
   F = 59 and below
8. Draw a bar chart
9. Convert each category into a percentage
10. Draw a pie chart

REFERENCES


