

Developments In Business Simulation & Experiential Exercises, Volume 22,1995

THE SPSS® STUDENT ASSISTANT: THE INTEGRATION OF A STATISTICAL ANALYSIS PROGRAM INTO A MARKETING RESEARCH TEXTBOOK

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ABSTRACT

This paper describes the philosophy and operation of a stand-alone tutorial developed to help students understand the many features of SPSS® for Windows™, Student Version, which is bubble-packed with a marketing research textbook (Burns and Bush 1995). The textbook and SPSS® Student Assistant are integrated so students learn the statistical analysis program's many nonstatistical features such as file handling, variable labeling, and graphs and practice them over the course of the term. With this approach, students are well versed and comfortable with basic operations in SPSS® for Windows™, Student Version, before they use it to perform statistical analyses.

INTRODUCTION

Teaching marketing research to undergraduate marketing students is difficult for several reasons. First, the course is typically one of a required core of courses in the major, and students are unexcited about their lack of choice in the matter. Second, there is a prerequisite of statistics, and students have vivid memories of the pain and agony they went through in required statistics courses. Third, it is challenging to maintain students' interest levels as one trudges through secondary data, sample size determination, and a host of statistical concepts. However, the fourth, and admittedly most difficult task, is to get students "up to speed" with a statistical analysis program so they can analyze data and make managerial sense of the results.

To date, the first three challenges mentioned remain elusive for the vast majority of marketing research instructors. However, this paper describes an integrated approach that addresses the fourth challenge, that is, the task of getting students "up to speed" with a statistical analysis program. Prior to the solution described herein, there were three options open to instructors. With tongue-in-cheek, we label them: (1) "Unmarried," (2) "Married," and (3) "With Children." The unmarried alternative requires the adoption of a marketing research textbook that has no accompanying statistical analysis program, and while there is no published research available to the authors' knowledge, observation suggests that this is the most prevalent case. Here, an instructor adopts a marketing research textbook, and he/she uses whatever statistical analysis program is available. A case in point is Ruben (1991) who has described how he adopted the statistical analysis program, MYSTAT, for use in his classes. Here, the entire burden to teach the statistical analysis program's operation falls on the marketing research instructor.

Case two, the married one, refers to an instance where the marketing research text comes with its own statistical analysis program. This characterizes the attempts of a few marketing research textbook authors in the 1980's. An early version of William Zikmund's textbook, *for* instance, included a statistical analysis program called EDUSTAT. Judging from the repeat performance data, this alternative has not been popular. That is, few, if any, marketing research textbooks include their own customized statistical analysis software today. For whatever reason, adopters have not expressed a wholesale positive response to this approach.

There remains the third case, "with children," to describe. In this instance, the marketing research textbook attempts to "be all things to most instructors" and to somehow accommodate the majority of instructors using the textbook with their various computer statistical analysis program preferences. To the authors' best knowledge, the with children case is currently championed by only two marketing research textbooks. These are Churchill's two textbooks (1991, 1992) both of which include a cardboard insert with the commands for SPSS®, SASS, and SYSTAT®. Assuming these to be the most widely adopted statistical analysis programs by teachers of marketing research, Churchill has sought to accommodate all adopters in this manner.

Unfortunately, there still remains for a vast majority of instructors of marketing research a significant practical problem no matter which one of the alternatives is selected. That problem is twofold. First, there is the problem of orienting students on statistical analysis computer program operation. This task is immense and it is worse in many ways than teaching them a foreign language. It is more difficult primarily because they do not want to speak the language, and it is exacerbated by the fact that when they make mistakes, the computer program responds with a second foreign language tantamount to gibberish. (We are referring to DOS programs, primarily.) The combination of the two is typically a disaster where students become less and less appreciative of the "wonders" of statistical analysis. In fact, because of their negative experiences with the statistical analysis program's syntax, they may develop deep aversions to it, to statistical analysis in general, and, ultimately, to the marketing research course. The second whammy of the problem is the burden placed on the instructor who must decide on precisely when in the course to unleash the statistical analysis program demon. Typically, this event is postponed until the Instructor has gained as much comfort as possible with the class, that is, late in the term. Invariably, however, the experience ends up with the

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instructor spending countless hours on orientation and damage control. To be sure, there may be instructors who have managed to bring these problems under control. However, they have come to this point unaided by the textbook.

THE SPSS® STUDENT ASSISTANT APPROACH

The purpose of this paper is to describe the philosophy, creation, and operation of an innovation in the teaching of statistical analysis software used in marketing research. The paper covers salient background facts, underlying pedagogical concepts, and it describes the operation of the SPSS® Student Assistant, which is the integration agent created by the authors.

Background

This innovation spans approximately five years of conception, implementation, setback, and redevelopment. Initially, the authors envisioned a companion statistical package with their planned marketing research textbook. In the early experience of this project with HarperCollins as the publisher, negotiations with SPSS® landed an agreement insuring that a Student Version of SPSS® (*SPSS® PC+ Studentware P/us for Business*, 1991) would be included with each copy of the marketing research textbook. (It must be noted that this *is* a DOS program.) Work progressed with this concept in mind and the book manuscript included a single section on how to use SPSS® PC+ Studentware, commonly used commands for loading files, labeling variables, and a host of other necessary functions. To be more candid, this version of the textbook used the “married” approach, and it assumed that students were “ready” just before they were to encounter the statistical analysis chapters in the book. Statistical procedures syntax was described in the various analysis chapters contained in the last third of the book. The project moved smoothly to the point of a completely edited final copy ready for print production when an editor personnel change in HarperCollins resulted in severe disagreements, ultimately resulting in a contract termination. Several months later, a new contract was arranged with Prentice Hall, who had acquired distribution rights for SPSS® products. This contract allowed for an SPSS® student version to be included with the textbook; however, it became evident by working with SPSS® principals that the DOS version had been abandoned, and the Windows™ version was now the standard. Essentially, SPSS® principals agreed to provide the software and manual for SPSS® for Windows™, Student Version, (1993) with each copy of the textbook. On the surface, this change was seen as a significant improvement; however, its challenges soon became obvious.

The first round of the textbook with the DOS version of SPSS® PC+ was straightforward in the sense that students could be informed of a limited set of commands, and they could navigate the program successfully for their specific needs as defined in the textbook. For instance, they could be taught how to: (1) read in a file, (2) setup variable labels, (3) set up an output file, (4) run a frequency table, and (5) exit the program. These steps equate

to five commands:

```
GETFILE = 'A:DATAFILE.DAT'  
VARIABLE LABELS A 'FIRST VARIABLE'! B  
                'SECOND VARIABLE'.  
SET OUTPUT = OUTPUT.LIS.  
FREQUENCIES A B.  
FINISH.
```

Those readers who use Windows™ will appreciate the immense challenge involved with the shift from a DOS format to a Windows™ environment. Whereas the DOS format might be characterized as a blank screen where one types in commands, the Windows™ environment is akin to a full disclosure situation because all commands are evident and readily accessible by virtue of the graphical menu platform. Perhaps a homey analogy will illustrate the difference. Teaching a DOS version approach is like shining a penlight in a room in a dark house: only a few objects in that room are illuminated and those that are not plus all other dark rooms remain invisible. Hence, the invisible objects are not part of the student’s consciousness and essentially do not exist for all practical purposes. However, the Windows™ approach is like flipping a switch that turns on a wide-angle flood light in every room: everything is illuminated, and all functions and features are immediately accessible. In other words, the explanation requirement is increased manyfold. Complicating this situation further, SPSS® for Windows™ includes several features not programmed in the DOS version including complete graphing capabilities, a data editor, and online help. Thus, the integration problem mushroomed necessarily to explaining virtually all of the features of SPSS® for Windows™, Student Version.

Pedagogical Concepts Underlying the SPSS® Student Assistant

Common sense underscores the need for programmed learning of complex concepts. That is, when confronted with teaching students complicated materials or involved processes, an educator is advised to adopt the philosophy of “one step at a time.” In essence, the prevailing wisdom is to use a building block approach with ample time for each block to become cemented in place before more blocks are heaped on. The securing of each learning block requires experimentation and time. That is, students must be given the opportunity to experiment with the concept at hand, and time must pass in order for the learning to become internalized. This principle is clearly violated by the marketing research instructor who waits until the “right moment” to introduce his/her students to the nuances of the chosen statistical analysis program whereupon he/she covers the orientation in a single class period. However, the SPSS® Student Assistant approach embodies the building block philosophy of learning.

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What is the SPSS® Student Assistant?

The SPSS® Student Assistant is a tutorial program programmed in Visual Basic that is integrated into the authors' marketing research textbook (Burns and Bush 1995). Consistent with the "one step at a time" approach, beginning in Chapter 2 and continuing in each subsequent chapter, students are directed to access some menu item in the SPSS® Student Assistant and review its contents. Basically, the SPSS® Student Assistant contains annotated examples of windows they will encounter when using SPSS® for Windows™, Student Version. The related material in each chapter describes how to operate certain features of SPSS® for Windows™, Student Version, and the SPSS® Student Assistant actually shows how these operations are performed. With the analysis chapters (15-18), the SPSS® Student Assistant is explicitly tied to the materials covered in each chapter. In the other chapters (2-14), an "SPSS® for Windows™" section is included that introduces the SPSS® for Windows™ concept(s), directs the student to review the menu item in the SPSS® Student Assistant, and review questions and exercises are also included to guide the student's experimentation with the program. The SPSS® Student Assistant is not designed to be a stand-alone tutorial program for SPSS®. The SPSS® for Windows™ materials and exercises in each chapter are there to help students gain familiarity and comfort with SPSS® for Windows™ so when they encounter statistical analysis chapters, they will not be forced to climb a very steep learning curve on software use alone. By the time they reach the analysis chapters, they are versed in graphics, file handling, labeling variables, variable labels, and a great many other functions of SPSS® for Windows™, Student Version.

A Guided Tour of the SPSS® Student Assistant

Students are instructed to install the SPSS® Student Assistant on the hard drives of their computers in the second chapter of the textbook. The installation procedure results in a program group with the SPSS® Student Assistant icon that can be double clicked for program access. In the first use, the SPSS® Student Assistant prompts the student to register his or her name, which then remains as part of the main menu. Figure 1 illustrates the main menu. Actually, Figure 1 is only one-half of the menu items as the main menu continues onto another "page" with the Next button. The operation of the SPSS® Student Assistant is identical across all of its menus. That is, the cursor is used to select an item by clicking on the open selection circle before the menu item desired, and a click on OK will activate the item (as will a double click on the selection circle). In most cases, a main menu item selection results in a menu item submenu where there are selection options pertaining to various aspects of the selected main menu item.

As can be seen in Figure 1, students are systematically introduced to the various features of SPSS® for Windows™, Student Version, as they work through the SPSS® Student Assistant menu items directed on a chapter-by-chapter basis. Chapter 2 describes the marketing research industry, and the "Overview of the Marketing

Research Industry" contains two graphs of the income and profits of the industry's major players plus two graphs on what marketing research activities are undertaken and how various U.S. industries' marketing research activities are generally organized. This is the only SPSS® Student Assistant selection that is not explicitly related to SPSS® for Windows™, Student Version, (although the graphs were made with SPSS® for Windows™, Student Version).

The "Quick Tour" menu items provide an overview of SPSS® for Windows™, Student Version, and summarize the operations under each of its main menu item. Figure 2 illustrates the basic format of the SPSS® Student Assistant, and it will familiarize those who have not worked with SPSS® for Windows™, Student Version, on its basic appearance and operation. As can be seen, the SPSS® Student Assistant shows a window from SPSS® for Windows™, Student Version, and there is an explanation below of what is being shown to the student in the window. Note the Next and Menu buttons that are used to "page" through the set of annotated windows under each menu item. The window in Figure 2 is the first one in its series. Subsequent windows have a "Prey" button to accommodate moving backward.

How the SPSS® Student Assistant Accomplishes Integration

Figure 1 illustrates the basic logic of the SPSS® Student Assistant's integration into the textbook. That is, as topics such as problem definition, secondary data, and qualitative research techniques are covered in the early chapters of the text, the SPSS® Student Assistant menu items that students are directed to review cover basic operations such as entering, naming, and saving data, labeling variables, and graphs. Typically, each chapter has a section identified with a special SPSS® icon that ties the SPSS® material to some example in the chapter. Note, for example, the references to Milk Bone, NFO syndicated data, and Red Lobster Restaurant. These companies are described or used as examples in the various chapters, and the SPSS® icon section refers to the company in some way. In the case of NFO (National Family Opinion) syndicated data, the students are provided with an abbreviated data set provided to the textbook authors by NFO, and they use SPSS® for Windows™, Student Version, to perform pie and bar charts to identify patterns in the data. With the other cases, however, a small data set is often provided, and students are directed in a later section of the chapter to perform the operations with SPSS® for Windows™, Student Version. Figure 3 is an example of these exercises in Chapter 10 which deals with measurement and question formats. In this exercise, students are to direct SPSS® for Windows™, Student Version, to identify missing values in a semantic differential measurement of Red Lobster Restaurant's image that have been coded with a "9."

There is a departure from this approach when students encounter statistical analysis procedures in Chapters 15-18. Here, each form of statistical analysis is first described conceptually, and an

FIGURE 1
THE FIRST PAGE OF
THE SPSS® STUDENT ASSISTANT'S MAIN MENU

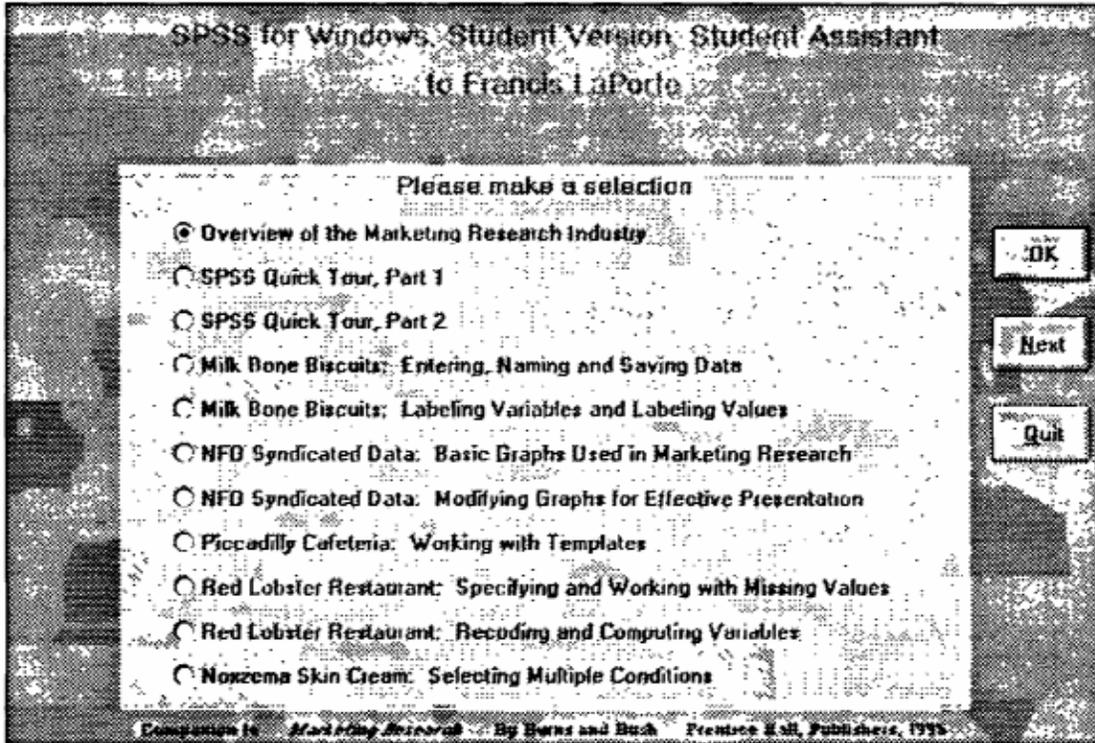


FIGURE 2
THE SPSS® STUDENT ASSISTANT SHOWS THE SPSS® FOR WINDOWS™, STUDENT
VERSION, MAIN WINDOW AND DESCRIBES ITS FEATURES

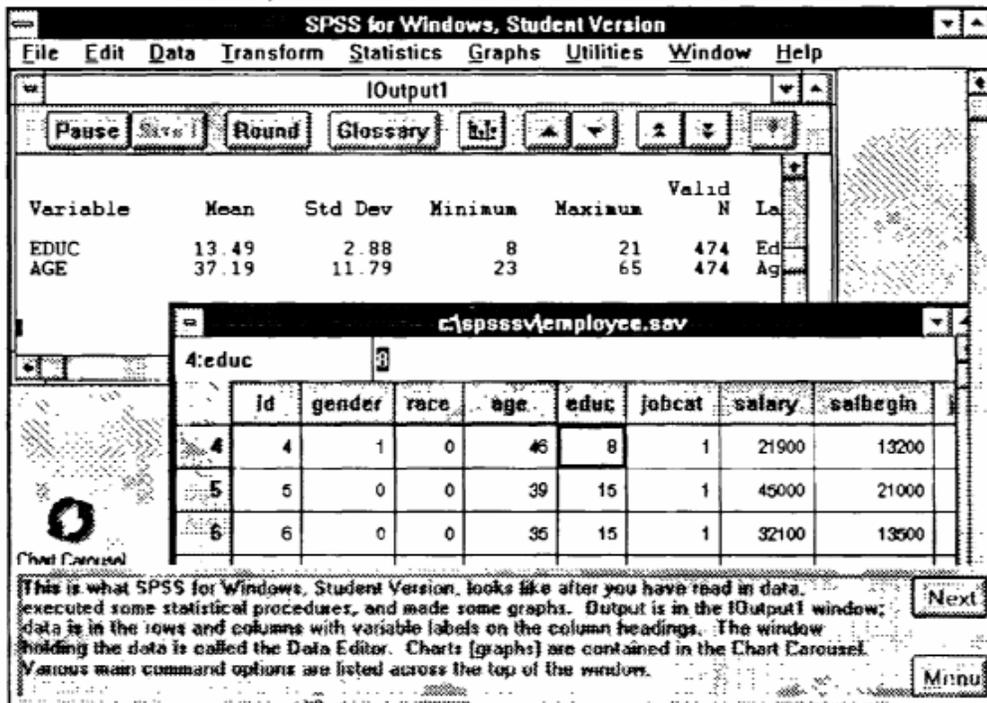


FIGURE 3
SPSS® END-OF-CHAPTER EXERCISES REQUIRE THAT STUDENTS PRACTICE THE FEATURES DESCRIBED IN THE SPSS® STUDENT ASSISTANT MENU ITEM ASSOCIATED WITH EACH CHAPTER

This set of SPSS® for Windows™, Student Version, exercises pertains to missing values. Before attempting the exercises, you should review the SPSS® Student Assistant Main Menu item, "Red Lobster Restaurant: Specifying and Working with Missing Values."

Below are the responses of six people who participated in the Red Lobster-Jake's Seafood Restaurant survey using the semantic differential scale described in this chapter. The semantic differential scale contained 7 response options along each bipolar opposite with labels. In the table below is a sample of ratings for Jake's Seafood Restaurant, and the number "9" was used to indicate that a respondent left the line blank.

Respondent	High-Low Prices	For Me-Not For Me	Limited-Wide Menu
1	1	5	2
2	3	6	3
3	9	9	2
4	2	5	9
5	5	9	2
6	3	9	3

Use the SPSS® for Windows™, Student Version, data editor to input these responses, and perform the each of the following.

1. Set up the following value labels for each of the three areas of Jake's Seafood Restaurant rated above.
 For high-low prices: Very high, High, Somewhat high, Neutral, Somewhat low, Low, Very low prices
 For for me-not for me: Very much for me; For me; Somewhat for me; Neutral; Somewhat not for me, Not for me; Very much not for me
 For limited-wide menu: Very limited; Limited; Somewhat limited; Neutral; Somewhat wide; Wide; Very wide
2. Identify "9" as a missing value for all three semantic differential rating areas.
3. Create a pie chart that includes the missing values slice for each area rated by the ten respondents
4. Create a pie chart that excludes the missing values slice for each area rated by the respondents.

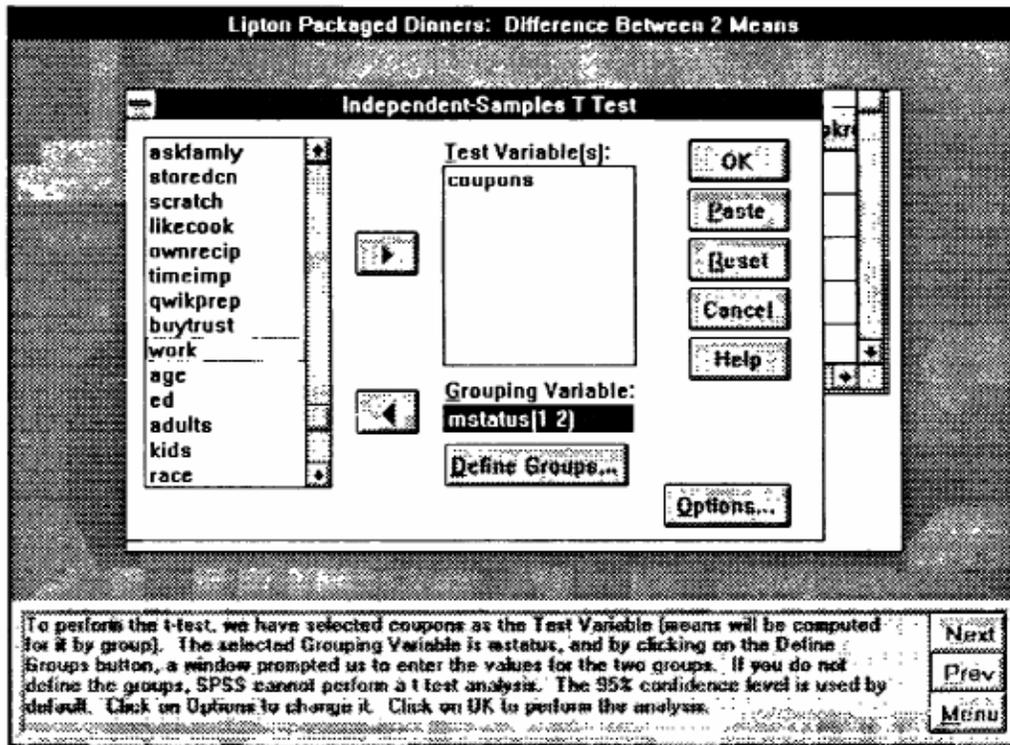
applied numerical example is described in the chapter. The SPSS® sections describe the Windows™ command sequence (e.g. Statistics-Compare Means-One-Sample T Test) and illustrates the output that is generated by SPSS® for Windows™, Student Version. The SPSS® Student Assistant uses the same data, and further shows how intermediate steps, typically with SPSS® for Windows™ dialog boxes, are performed. Figure 4 illustrates how the SPSS® Student Assistant describes the use of the dialog box associated with the t-test procedure. With each statistical analysis type, the SPSS® Student Assistant describes the data set, illustrates how to access the analysis type, explains how variables are selected and how various statistical analysis options are activated, and provides the output for students to review.

When the SPSS® Student Assistant is installed, four separate data files are also copied to the hard disk, and cases at the ends of the analysis chapters direct students to use SPSS® for Windows™, Student Version, to perform necessary statistical analysis. Smaller data sets are included in exercise questions as well.

CONCLUDING COMMENTS

Because some may see our description as self-serving, we will conscientiously avoid making a sales pitch and focus our concluding comments, instead, on the pedagogical implications directly inhering to the rapid computer technology advances that

FIGURE 4
ILLUSTRATION OF HOW THE SPSS® STUDENT ASSISTANT DESCRIBES THE OPERATION OF AN SPSS® FOR WINDOWS™, STUDENT VERSION, DIALOG BOX



are changing our collegiate pedagogical world. The Windows™ environment affords a rich communication platform, one that effectively mixes color, word, graphic icons, and multiple levels of visual detail in a single communication collage. Many of our students already embrace this technology, and most of the rest of our students are on the verge of being socialized into the use of this technology, so the challenge is for us to remain abreast of the experiential learning possibilities now before us. The SPSS® Student Assistant is but one example of how much greater integration of computer exercises can now be accomplished in a representative course. We believe that other possibilities abound; although, at the same time, we do not see appreciable evidence of our colleagues working to convert them to fruition. More significant, on the horizon, and rushing toward us as high speed, are CD-ROM capabilities, sound-and-motion packages, and access to the Information Highway, not to mention the daily advances made by software companies that render their programs ever more flexible, friendly, and faster. Collegiate business educators cannot afford to ignore the mandate these technological advances carry for their teaching effectiveness: embrace them or go the way of the dinosaurs.

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