ABSTRACT

Journals, also called notebooks or log books, are frequently used in conjunction with computerized business simulations. This paper discusses the use of notebooks, as a form of learning device. The paper takes the position that while notebooks are used by most instructors -- as a written assignment to accompany the simulation -- instructors are not sure what to expect of notebooks and/or have no criteria by which to evaluate notebooks. The paper suggests that a notebook’s use can be enhanced through the use of menu-driven computer support programs. The paper describes one such support program written with LOTUS 1-2-3 (release 2.00)™ for the DECIDE™ simulation.

INTRODUCTION

Many instructors who use computerized simulations in their courses frequently require their students to keep a log, journal or notebook of their decisions. If you are one of them, then this article is for you. Similar to our experience you may have found that for the most part, notebooks tend to reflect “seat-of-the-pants” decision making and analysis, rather than clearly thought out planning and strategic analysis. Before a recent semester, one of the authors put what he considered to be examples of “excellent” notebooks from past semesters on the reserve reading shelf in the Business Library (three different notebooks). You can imagine the result: students simply mimicked these notebooks. Perhaps Dr. Samuel Johnson’s epigram for the student would be appropriate here, “Dear students, your notebooks are both good and original; unfortunately the good parts are not original and the original parts are not good!” Thus, instead of reading about well defined strategies and carefully planned decisions, we read entries such as: “We really did not understand why stock price or ROI (or almost any dependent variable) was acting this way, so we went ahead and changed our price or promotion (or some other independent variable).” Or, “We changed X or Y and it seemed to come out okay.” Or, “We wanted to experiment with promotion, but we ran out of time.” While such statements are more or less expected during the first round of decision making, these comments unfortunately appear throughout the rounds of play. In fact it sometimes appears that students’ confusion about which variable(s) is related to which only increases during subsequent periods of play. Conclusions stated in the notebook reflect a general feeling that they got a lot out of the game, even though there were problems with the computer. Some students are candid enough to confess that they are not sure what to write in their notebooks. Unfortunately, reading a notebook of this kind leaves one with the feeling that students are still using guesswork to make many of their decisions.

Notebooks reflect the failure of students to adequately integrate the qualitative and quantitative techniques. This seriously limits the value of notebooks as a learning tool.

We should not, however, totally blame the students for this lack of sophisticated analysis. We believe that the inadequate kinds of analyses frequently found in notebooks reflect a shortcoming of both students and instructors. Instructors, for example, expect that students have become so familiar with various kinds of quantitative techniques that the students can use them quickly to assist in making their decisions. This expectation, however, fails to take account of the fact that students have only a cursory knowledge of most techniques, and also that computer support in utilizing such techniques is not readily available to the students -- or if it is, it is not tied into simulation in such a way so as to make it readily available for the student to apply. Perhaps we expect the students to integrate many different skills and techniques, when in fact, we ourselves have not provided students with adequate ways in which to do the integration. This led us to ask several questions:

1. What do we expect of the notebook?
2. Can we improve the method by which students maintain the notebook -- and if so, how?
3. How should we evaluate the notebook?

The Notebook

It is not uncommon to find the use of notebooks or journals in classroom settings. Many Literature courses, for example, require that students keep a notebook as part of the course (Platt, 1975b). The idea being that notebooks can augment writing skills simply by requiring that the student write daily and that the notebook forces the student to carefully and clearly think through their explanations for or about various phenomena.

Surprisingly, little has been written about the “notebook” as a pedagogical tool for computerized management simulations. This is particularly noteworthy since we know, based upon casual conversations with ABSEL members that their use or recommended use is standard in many courses. Many of the instructors’ manuals which accompany computerized simulations recommend that a notebook or journal of team decisions should be maintained and that it should reflect the rationale for the teams’ decisions. As instructors, however, we have to ask ourselves whether we make it clear what the notebook should contain. While it might be difficult to state precisely what an ideal notebook should look like, most would agree that It should have something more than guesses as to why certain numbers were chosen. One particularly
important feature might be the demonstration of students' ability to understand the interrelationships among the variables. Unfortunately, students' other attempts at understanding or analyzing various relationships generally fell well short of expectations. There are several possible explanations for this: 1) students do not understand what is expected of them in the notebooks; 2) students do not have the skills, time or permission to analyze data and conclude what those relationships mean; 3) students have forgotten how to use or never truly understood the basic quantitative skills necessary to serve as the basis of a notebook; or 4) students have forgotten how to use or never truly understood the basic quantitative skills necessary to serve as the basis of a notebook.

From the instructors' standpoint, the notebook has the potential to maintain a data base which serves as the basis of a notebook; or 3) students have forgotten how to use or never truly understood the basic quantitative skills necessary to serve as the basis of a notebook. It serves as the basis of a notebook; or 3) students have forgotten how to use or never truly understood the basic quantitative skills necessary to serve as the basis of a notebook.

Improving the Notebook Through Automation

If we accept the idea that keeping a notebook contributes to learning, then we must look for ways to improve that process, and thereby, minimize the problems above. To facilitate use of a menu-driven notebook, a menu-driven data-base and report program was developed for a general purpose policy simulation, DECIDE. The authors believe that this program can easily be adapted for use on any general purpose policy-type simulation. In order to develop a totally integrated program, the authors decided to combine a data-base/report program with the program already developed for the DECIDE program.

Use of the Menu-Driven Program

Students receive a worksheet template to be used with LOTUS 1-2-3 (Release 2). On an IBM microcomputer, students are instructed to write the template diskette into Drive B, the LOTUS system diskette into Drive A, and then to load the LOTUS spreadsheet into Drive A. When the computer is then executed and from this point on, the process is completely automatic and menu-driven. At this point the student has two options, entering new data (viz., the next round of decisions for the simulation), or entering the menu management analysis (see Figure A).

Figure A: General Options Screen

1. BEGIN DATA ENTRY FOR A SPECIFIED PERIOD
2. BEGIN ANALYSIS OF DATA IN THE DATABASE

The last screen under the procedures option is designed to be used in conjunction with other options described above. The menu-driven report program provides a menu with the option to see all of the report options. The menu-driven report program estimates an integer number of iterations (and/or changes in the model) and displays a report summarizing the output. Additionally, the report program allows the user to choose the option to run the report program after obtaining the input data. The report program can be used to analyze the data and obtain a report on the results. The report program can also be used to analyze the data and obtain a report on the results. The report program can be used to analyze the data and obtain a report on the results. The report program can be used to analyze the data and obtain a report on the results.
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As shown, one of the options the student has is the QUIT option, which further allows the student to include or exclude the present round of decisions into the data management/analysis program. If the student decides to continue, he/she has the following options, as illustrated by Figure C.

This screen marks the beginning of the data management/analysis phase of the program. The student has two basic options, either perform regression analysis or graphic analysis. For example, let us assume the student elects to do some graphic analysis. He or she would select Option 3 shown in Figure C and a screen would automatically appear asking the student if he/she wanted to perform regression analysis or graphic analysis. Since the student wanted to perform graphic analysis, he/she would choose this option and another screen would appear providing his/her set of initial options regarding his/her choice of variables to be grappled. Figure D illustrates one of the first screens under the graphics option.

To construct a graph, the user simply responds to prompts which are then automatically generated. Incidentally, students may select a line graph, bar graph, or another type graph. This feature provides the student with the flexibility to view a single set of variables in several different graphical formats.

Another feature built into the program is the ability to perform bivariate and trivariate regression analysis of variables which are selected by the students. As in the case of graph construction, the regression process is fully automatic and simply requires that the student select the variables which they would like included in the analysis. Figure E shows sample output as it is presented to the student.

If more variables are to be grappled, the student would simply return to the data management screen and select another set of variables to be included in the analysis. If the student is satisfied with the variables selected, the program will automatically construct the graph and present it to the student.

In conclusion, the notebook through automation is an invaluable tool for the student in business simulation and experiential exercises. It allows the student to easily manipulate and analyze data, thereby providing a deeper understanding of the concepts being studied. The notebook also enhances the learning process by providing a visual representation of the data, which can be helpful in understanding complex relationships.

If you need further assistance or have any questions, please do not hesitate to contact me. I am here to assist you in any way I can. Thank you for your time.
One of the highlights of this program is the glossary, which is basically a brief explanation of the key terms used in regression analysis. You will notice that the glossary appears on the right side of Figure E. This feature was built in to serve as a review aid for students who presumably learned regression analysis in a previous course. Using regression analysis students can readily observe the influence of one (or more) variables upon another variable, and do so over time. The main point is that this is the actual, historical data for the student’s own firm.

Advantages of the Menu Drive Program in the Preparation of the Notebook

The use of the menu driven program facilitates the preparation of a notebook in several ways. It simplifies the process of building and maintaining a data base of decisions and results. It permits the user to generate numerous graphs and regression analyses with ease. As a result it encourages students to do far more analysis than they would be apt to do if the process were more tedious. Students are given some guidance and assistance in doing and interpreting their results and therefore generate more meaningful results.

A typical problem that this program overcomes is the one concerning historical analysis. Students often do not know which data to use in their regression analysis. For example, students make a set of decisions for a particular period, e.g., set the price of their product, determine the amount of labor to schedule and inventory to purchase, etc.; then enter those decisions into the competitive arena (with other teams) and finally receive the results of those decisions, e.g., stock price, inventory, etc. However, in constructing a data base, they should enter for a particular period, some of their decision entries for that period, e.g., price, promotion, R & D, etc., and some of the output (after the actual round of competitive play occurred) into the data base for that period. The program prevents them from confusing this data base entry by telling them which decisions actually will be taken from their present set of decisions and entered into the data base and which entries they will have to obtain from their print-out and enter into the data base for that same period of play.

The Notebook -- Evaluation

Evaluating a notebook remains the most difficult part of the instructor’s task (Platt, 1975a). However, with this program, several points about grading can be made. First a minimum standard can be set. That is, all notebooks can be expected to have graphics and regression analyses. The choice of which variables and the student explanations (e.g., reference to economic or marketing theories) account for the various relationships has to be explained by the students. This cannot and should not be part of the program. However, there is no excuse for students not to carry out such analyses with rationalizations such as: “we didn’t have time;” “we could not get the program to operate;” or more importantly, “it was too hard to transfer all the information to a spreadsheet package.”
CONCLUSION

Notebooks are an important part of the learning process, if for no other reason than they force students to express and explain their decision criteria in written form. Certainly, the maintaining of a notebook can be justified by informing the students that today's businesses are looking for people who can not only make good decisions, but accurately and concisely explain -- in writing -- why these are the "best" decisions.

The menu driven data base and DSS program described above does not (and should not) write explanations about variables for students, but it goes a long way in helping the students to focus on the explanations for why things occur, while relieving them of the drudgery of having to go outside the simulation itself for tools and software to help explain and understand why various relationships occur.

While the program above is specific to the DECIDE Simulation, it can easily be adapted for most general purpose policy simulations.

REFERENCES


