

Developments in Business Simulation & Experiential Exercises, Volume 15, 1988

Teaching Controversies: A New Approach to Computer-Assisted Instruction and Simulation Packages

Anastasios Papathanasis, Economics¹
Patricia Sanders, School of Business
Central Connecticut State University

Abstract

Current computer-assisted instruction (CAI) and simulation modules utilize a highly linear methodology to teach business and economical concepts. They introduce topics such as supply and demand, GNP accounts, profit maximum, and business policy in a well-structured but highly mechanistic and uncritical way.

A simulation or computer-assisted-instruction (CAI) program designed to teach controversies could eliminate some of the subjectivity and shortcomings of current experiential learning methodologies.

I. Introduction

Simulation and computer-assisted-Instruction (CAI) methods are often beset with problems. They teach concepts in a highly linear, well-structured, but mechanistic, and often subjective way. This has led some researchers to assert that simulations may not be appropriate in all situations and at all times [5]. Often, the methodology itself is questioned. The participants in the conference, THE SCOPE OF ECONOMICS, held in 1986 at MIT by the Joint Council on Economic Education, have for example concluded that the teaching of economics should focus on controversies.

The need for alternative methods is acute. As Basuray and Shani [2] have indicated, many educational paradigms have as the main objective the imprint of a specialized learning philosophy on students. Fraser [4] even contends that simulations may itself be indoctrination in disguise. His prescription of designing two simple cases for every variable to be investigated is not her attempt to express dissatisfaction with the linear method and to plea for the introduction of controversies. However, even when a variety of topics is introduced via an experiential exercise, often the philosophical caveats of linearity are ignored [3].

In the following sections we assert that the successful teaching of controversies requires the development of new types of CAI and simulation. It demands a new philosophy as well as a new methodology in designing appropriate modules.

II. Design Criteria for CAE and Simulation

Technical Criteria

A successful simulation or CAI package must include the following three criteria, realism, ease of understanding, and reliability [7, p. 259]. An efficient module should convey the illusion of reality and to capture the imagination

and interest of the student, and it should be transparent to students--avoid undue complexities. Confusing screens or ambiguous instructions distract students and force them to pay attention to the form and not the content of the module. The modules should, finally, contain one-key commands and error-trapping sequences.

Another important criterion when developing experiential exercises centers on interesting presentations. Often, tedious and boring CAI and simulations alienate students. The computer screen is substantial for the printed page, or worse, the students are subjected to the boredom and monotony of the key board. The CAI package, Income-Outcomes, for example, developed by the Agency for Instructional Technology (A IT) the Canada Foundation for communication (Intl the Joint Council on Economic Education (JCEE), requires students to spend approximately fifteen minutes to half an hour in a laborious and tiring exercise of designing a hypothetical spaceship before they can proceed with the exercise II.

Finally, well-designed CAI and simulation packages should be accompanied by a clear and complete instruction manual, contain variable levels of complexity, and provide the administrator with the facility to change topic assumptions of the model.

These criteria, however, relate only to the design of the module. They do not specify what standards should be met with respect to the material that is included in the simulation. For example, little attention has been focused on the objectivity criteria which may be just as important as the design criteria.

Objectivity Criteria

Even areas such as business, economics, law, psychology, etc., is often easy to commit a number of pitfalls. When designing experiential exercises, one may commit the same mistakes that plague many textbooks. For example, one may commit some or all of the following caveats.

Bias.

The personal perceptions of the simulation architect often, and not always by design, creep into the exercise and taint its pedagogy. In simulations of markets, for instance, the urge to extol the efficiency of the market often hires the designer into ignoring the accompanying severity of market-ratification schemes. Few if any modules reflect that the efficient allocation of resources is often accomplished by the elimination of buyers who cannot afford to pay the market-clearing price. More

¹ Financial support for this project was provided by the Kazanjan Foundation for Economic Education.

Developments in Business Simulation & Experiential Exercises, Volume 15, 1988

serious, often the assumptions of the model are downright questionable. As Richard D. Teach [6] has pointed out, profits are not necessarily the surrogate measure for managerial ability, yet they are used as such in business simulations.

Loaded Terminology

The choice of expression in simulations and CAI often depends on the designer's bias or lack thereof. One author's "red tape" is another author's "enlightened government action."

Fallacy of Composition

Seldom do simulations and CAI packages extrapolate from the micro level to the macro level. As a result, they often propagate notions of efficiency which may be untenable.

Cause and Effect Errors

Avoiding causality mistakes is difficult. As the example of explaining the causes of the Great Depression has shown, it is difficult to be objective. One may easily state that the money supply caused the economic collapse in the thirties. It is just as easy, however, to argue just, as persuasively, that the economic collapse was caused by the Oust Bowl and the crash of the stock market which might have caused the failure of the banks. The accompanying financial crisis lead then to the decrease in the money supply.

Conceptual Inaccuracies

The cultural environment is seldom incorporated into modules. When students are introduced by CAI or simulation to the problem of scarcity, they blindly assume that scarcity is a universal phenomenon. Yet, it is never pointed out that scarcity is associated only with developed industrial economies. There is hardly a simulation or CAI package that mentions the fact that the Indians of the Amazon, for example, may have less of everything than people of developed nations, yet they do not understand scarcity because the notion of unlimited wants is foreign to their way of thinking.

III. Current Computer-Assisted Instruction and Simulation Models

By its very nature CAI is linear and content bound. Using CAI has many heuristic advantages, among them the facilitation of learning by presenting content in logical sequences and in manageable segments. A major objective of CAT is to assist the student in learning the content of a discipline.

The majority of the available simulation or CAI modules, however, utilize the linear tutorial- interaction-self-test procedure. The typical economic reasoning model of the popular CAI package Income- Outcomes, for example, consists of the following:

1. State the problem
2. Gather information
3. Observe relationships
4. Form a hypothesis
5. Test the Hypothesis

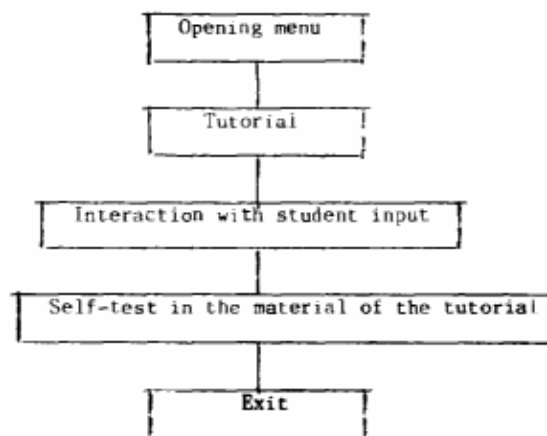
Most computerized business simulations have been designed to develop problem solving and analytical skills in students. Both CAI and computerized business simulations focus on content, and problem solving skill or analysis.

Synthesis and agreement or disagreement is the student's prerogative, but usually developed independently after the particular module or simulation is completed.

In general, CAI and simulation packages follow the same technical procedure. Upon signing on, the student enters his or her name and often a password. Next, the main menu of topics corresponding to chapters in the textbook appears on the screen. After selecting a particular topic, the student reads a tutorial that may feature animated graphs and overlays and proceeds with a multiple choice, or fill in the blanks drill session on the subject.

The modules allow students to move back and forth through the pages of the tutorial, take a break, return later, and resume at the point where they left off. Multiple readings of the tutorial are as a rule possible.

The quiz sections, finally, present multiple- choice or fill-in-the-blanks questions, and in some cases require students to enter a correct numerical response before they can proceed. Upon completion of the quiz, the students are presented with their score. A generalized and simplified linear CAT model is presented in Flowchart 1 below:



Flowchart 1
Linear CAI and Simulation Methods

IV. An Alternative: Controversies

Controversies remove the monotony of conventional linear CAI and simulations and stimulate the interest and critical evaluation capacity of students. More importantly, controversies present both sides of the argument and thus neutralize biases and loaded terminology.

Controversies could give equal emphasis to both (or more) points of view and in a dialectic fashion. They could eliminate teacher expertise bottlenecks, and allow students to decide for themselves on the issues when the issues are presented in the neutral and impartial fashion of controversies.

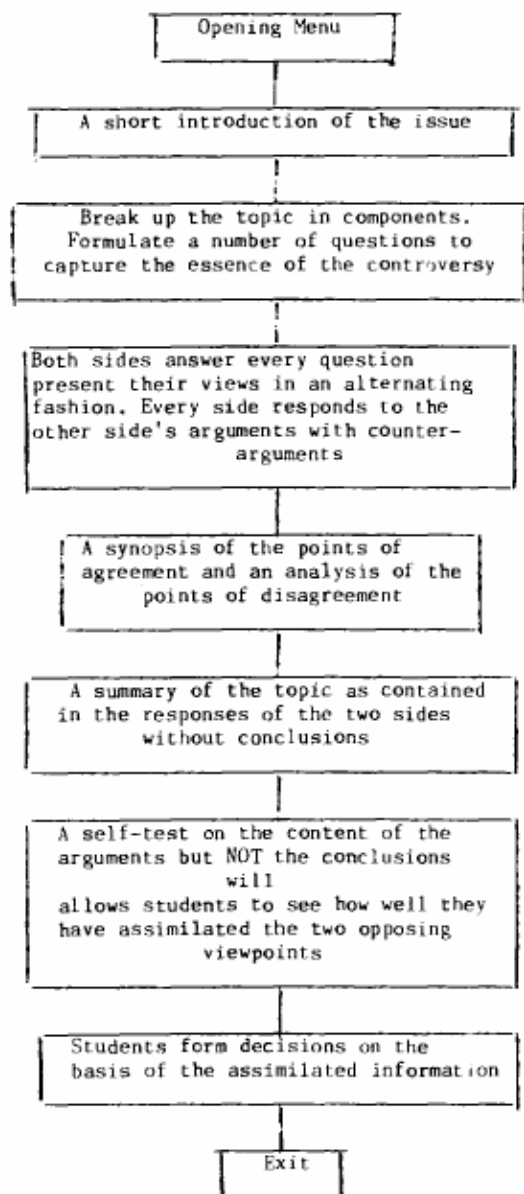
Once students have mastered the content of the opposing sides, they could be encouraged to develop and present their own opinions with supporting data, either from the CAI or from supplementary course and Library materials. For example, a common controversial issue in introductory business courses is the role of business in modern society: is it solely to maximize profit or to promote social responsibility along with profits [6]? Students would

Developments in Business Simulation & Experiential Exercises, Volume 15, 1988

be exposed to the opposing points of view and develop their own opinion using the dialectic model in Flowchart 2.

A whole subset of experiential exercises are possible and could be used in conjunction with the CAT to teach controversial issues. These include role playing, formal classroom debates, or small group 'buss sessions.' The dialectic CAI model to teach controversy could be used as a basis to develop full research papers, position papers, or to develop decision matrices where best case and worst case business scenarios could be developed.

There are many advantages of using CAT to teach controversy and to present controversial issues to students. One of the most important advantages is that it encourages the development of critical thinking skills and independent analysis. In addition, it forces students to make subjective evaluations and to use value judgments.



Flowchart 2

If used along with a role play or formal debate, controversies encourage students to 'think on their feet,' so to speak, to be spontaneous and to anticipate questions and other points of view.

Another important advantage to using controversies is that it focuses on process as well as content. That is, it encourages students to be selective in using information, and to distinguish fact from opinion.

V. Evaluation of the Two Methods

Although current linear modules may satisfy the technical criteria, they fail in meeting the test of objectivity and fairness demanded by the Objectivity criteria. It is difficult to design a tutorial that eliminates all elements of discretion or error.

The major benefit and advantage of the controversy approach, on the other hand, is its absence of subjectivity. When students are presented with both sides of an argument in an evenhanded way, they understand the issue in a more complete fashion-- controversies may be interpreted as conflicts of opinion based on facts and logic, not sentiment.

Obviously, there are also some disadvantages or areas for concern in using controversy as a method of instruction. Two major areas of concern are time management and evaluation. The instructor must be cautious that students do not wander too far from the main content area of a given course, and that emotionality and opinion are not dysfunctional to conceptual content.

While it is easy to evaluate the content in a controversial issue, it is more difficult, and more important, to evaluate the process. That is, how does the student come to his or her conclusions, what is the logic or rationale behind the conclusions, what supporting data is provided, what are the assumptions underlying the data or conclusions? Above all, the instructor must avoid the temptation to evaluate students on the basis of agreement or disagreement with the students' conclusions,

VI. Summary and Conclusions

This paper introduced a model for using controversies as a classroom learning method. The basis for the controversy model is the Socratic dialectic method where content is consciously organized into opposing points of view or in dialectically opposed schools of thought. A major objective for using controversy as a learning method is to encourage students to synthesize content, to develop critical thinking skills, and finally to develop their own independent opinion or position.

Selected References

1. Agency for Instructional Technology (AIT), Income Outcomes, the Canadian Foundation for economic Education, the Joint Council on Economic Education Bloomington, Indiana,
2. Basuray, Tom M., and A. B. Shani, "Experiential Learning Revisited: Some Thoughts on Designing More Adaptive Management Education Programs," Developments in Business Simulation & Experiential Exercises, 1986, pp. 80-84.
3. Edwards, W. F., "Learning Macroeconomic Theory And Policy Analysis Via Microcomputer Simulation," Developments in Business Simulation & Experiential Exercises 1987, pp. 50-52.

Developments in Business Simulation & Experiential Exercises, Volume 15, 1988

4. Frazer, Ronald J., "Simulation, Indoctrination or Learning," Developments in Business Simulation & Experiential Exercises 1986. pp. 108-9.
5. Soukup, W.R. , "A .Powerful Tool--For What?" Developments in Business Simulation & Experiential Exercises , 1987, pp. 97-200.
6. Teach R.D., "Profits: The False Prophet," Developments in Business Simulation & Experiential Exercises 1987, pp. 205-7.
7. Whitney, Gary, "A Comparison of Two Business Strategy Simulations For Microcomputers," Developments in Business Simulation & Experiential Exercises, 1984.