The Teacher

FOR THE CLASSROOM

Using the Microcomputer in the Classroom: Initial Considerations

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The personal computer or micro-computer is one of many pedagogical tools available for classroom use. Depending on the area of teaching, the computer can replace or augment such standard devices as the hand calculator, typewriter, programmed-learning workbooks, and simulations.

As with all teaching tools, the computer requires a great deal of preparation by the instructor. The computer must be integrated with course content in a manner consistent with course objectives.

This article outlines several of the factors one must consider in develop-ing a computer component for a course. It will consider the positive and negative aspects of computer use from both the students' and instruc-tor's perspective, common myths about computer usage, ways to approach the process of planning computer usage, and places to look for inexpensive teaching oriented software.[1]

The Computer as a Teaching Tool

At least three objectives are tied to classroom use of the computer. First, teaching students to use computers gives them skills sought after by future employers.

Despite the emphasis on computer literacy that is supposedly sweeping the public school system, many post-secondary instructors are finding that a large portion of their students, both those of traditional age and adult learners, have little if any com-puter experience. A sizeable number of students have never taken a basic typing course in high school much less a "keyboard" class teaching typing skills on the microcomputer.

Even many students with computer experience are coming to class with minimal word processing or data entry skills. Some have been using hard disk machines bought with a package of programs installed by a retailer or a friend. These programs are often loaded via a DOS shell: the student simply turns on the com-puter, sees a menu on screen, high-lights a program name with the cur-sor, presses "enter" or clicks a mouse, and the program begins. Someone with this level of experience is unable to install a new program or accomplish any other nonroutine task.

Second, computers can be used as alternative mechanisms for transmit-ting course content. This can be done in class, in a laboratory setting, and/or as homework brought back into the classroom for discussion.

Third, computer usage immerses the student in a series of activities that develop patterns of systematic, logical thought and analysis. Work-ing with a simulation, spreadsheet, statistical package, and most other categories of software requires care-ful planning of actions to be taken, including thought about the results of these actions and the next steps needed to complete a task.

The computer forces students to deal with the consequences of their own actions. Students learn that a computer follows the syntax and logic given it by a programmer. When the results of computer work are unsatisfactory, students even-tually come to understand, however grudgingly, that their own lack of attention to details, failure to plan, and attempts to shortcut procedures are at fault—not the computer.

Especially useful lessons of logic can be taught using a computer sim-ulation. Sometimes simulation pro-grammers manipulate the logic and available alternatives to predetermine a decisional outcome or its impact. Discussion of the manner in which underlying assumptions, basic defini-tions, and decision rules can affect outcomes is a useful teaching device over and beyond any factual infor-mation transmitted. Many simula-tions have the added advantage of being inherently enjoyable and interesting.

Myths

Over the years several myths have developed about the computer as a teaching tool and about faculty who use it. These myths are often tied to the view that the computer dehuman-izes the educational process.

Myth 1: Introducing the computer into the classroom results in re-duced student-teacher interaction.

In reality the amount of student-instructor interaction increases if computer exercises are integrated into the course. This is particularly true in smaller colleges and universities where graduate students do not serve as buffers between the faculty and undergraduates. A corollary myth that those who introduce the com-

puter into the classroom want to avoid student-instructor interaction is often fostered by faculty unwilling to spend the time and effort required to examine computer usage as a teaching technique. It is, for example, easier to drone on about urban planning aided by tattered notes than to face the multiple challenges of SimCity.[2]

Myth 2: Introducing the computer into the classroom is one way to decrease preparation time.

Actual preparation time goes up, especially prior to the first introduction of a program and/or exercise into a class. Even when computer oriented material has been used before, updating instructions, maintaining mechanisms for computer access, and the like can consume large blocks of time.

Computer exercises work only if the instructor places them in the context of course objectives, explains the computer related material in terms of those objectives and the exercises themselves, helps the students with problems as they develop, and integrates the exercises into the class discussions and/or written materials. This is not a recipe for short preparation time.

Myth 3: Working with a microcomputer requires student ownership of a computer or at least access to enough computers so that during class each student is at a separate computer.

Most of our undergraduates do not own computers, and the laboratory we use has fewer computers than students in a class. During class exercises the students work in groups of two or three. Homework is assigned on an individual basis, but the students are encouraged to interact. Both in and out of class, group work makes it possible to use students with higher computer literacy levels as assistant teachers.

Experience has taught us that the star student, the average learner, and the learning-impaired student can benefit from using the computer, especially when the group approach is used. The star often rushes through programs and assignments making mistakes that need correct-

ing. The learning-impaired student may be slower at reading and performing tasks but that slowness tied to careful, deliberate action often results in fewer errors. By working together, each student benefits from the strengths of the other.

The group interaction process also encourages students to experiment with the programs and exercises. The teacher knows that the process is working when she or he hears the phrase, "Why don't we try this?"

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Group work also facilitates later classroom discussion.

Using the small group approach means that the instructor must be willing to relinquish control, to sit back and let the students interact, to accept higher noise levels in the classroom and lab, and to let students make mistakes and learn from them.

What the Instructor Must Do

Before you can use a program in the classroom, you must be thoroughly familiar with it. The first step is to read the documentation carefully. Next, you will need to slowly work through the program. During this time keep a set of notes on the problems you encounter, places where the documentation is unclear, and mistakes you make and how you correct them. If the documentation is

inconsistent, contains typographical errors (fairly common), or leaves questions unanswered (even more common), record these problems. If you experience them, the students will also. These early steps alone consume days and even weeks.

If possible, use a new program that you intend for the classroom to perform research or personal tasks even if it is not the best tool available for those tasks. In this way you will internalize it and also pick up on additional quirks it may have.

The notes taken during the initial run-through and subsequent applications can be used to design more specific instructions for the students or to rewrite portions of the exercise manuals.

The instructions developed for the students should require them to keep notes on their computer activities. These notes should include the problems they encountered with the program and how they solved them. They should instruct students to note error messages and to use a screen dump to the printer to save especially long ones. The instructions should encourage them to ask each other questions, but they should be made to understand that they are ultimately responsible for completing the exercises on their own and being able to do so again.

Students should be encouraged to maintain a file folder for their computer work. This file should contain their computer disks, manual, and exercises as well as all written instructions distributed in class and their notes related to the computer exercises. It is common to see students who are not organized in this way consume a quarter of an hour just getting started in a lab session and take far longer than necessary to accomplish even the simplest tasks.

What Some Students Will Do

When you first introduce computer exercises, expect some students to have a negative attitude toward the computer because they do not want the homework associated with the computer or, in a few instances, they are fearful. Fear of computers has several origins. Some think they will break the computer. Others, even successful professionals, doubt their

ability to master it and believe that they will appear foolish. Some simply fear change and doing things in a new way.

As an early step determine if your students know how a keyboard works. Since some may not know how to type, you may have to explain keyboard basics unrelated to computer keyboard layout and usage. For example, students who cannot type often do not know how to use the Shift key, do not understand that the lower case 1 is not the same as the number 1, and do not know the function of the Tab key.

Students will often try to rush through their computer work. They will at first tend to avoid planning their actions and fail to read manuals and instruction sheets before sitting down to the keyboard. Students seeking your assistance under these conditions should be pointed to these printed sources. This can be done gracefully (e.g., "You probably weren't aware that the instructions for changing the directory can be found in . . ."). Of course, one must be there with help and encouragement when they have done the necessary preparation.

Finding Inexpensive Computer Software

Shareware and public domain software are excellent sources of inexpensive programs. Shareware gives you the advantage of being able to test and experiment with programs before making the decision to buy more complete or newer versions for permanent use. It also makes feasible student ownership of programs and documentation.

Shareware

Shareware is distributed by retailers at a nominal price (usually under $5 per disk). It can also be freely copied and distributed by anyone. However, those who find that the software meets their needs are considered morally obligated to register their use with the manufacturer. This is done by paying the registration fee specified on the software's README.DOC or similarly named file. The registration fees typically

range from $15 to $75 with volume discounts frequently available.

The benefits of registration usually include receipt of a printed manual that usually is more complete than the manual or instructions the user can print from disk. In many instances registration brings an enhanced version of the software and telephone support if problems develop. Registered users are often notified of program upgrades that are made available to them at reduced prices. Since many shareware programmers sell a variety of products, registered users receive mailings on other programs as well.

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Many shareware programs are very powerful and represent excellent value. Most are written for the IBM-PC and compatible computers.

Public Domain

Software in the public domain is distributed at the same low cost as shareware. Buyers may freely reproduce the public domain software; no moral obligation to pay the manufacturer exists. The documentation supplied with the software varies from detailed to nonexistent in terms of content and excellent to very poor in terms of quality. Public domain programs tend to be older and of somewhat poorer quality than shareware.

Shareware/Public Domain and Low-Cost Software Sources

The sources listed below have been found to be reliable suppliers.

Computer Solutions
P.O. Box 354
Mason, MI 48854

Phone: 1-(800)-874-9375 (orders); 1-(203)-746-6372 (information); FAX: 1-(203)-746-1894 (24-hour)

For the IBM-PC and compatibles: 1-9 Disks $3.49 each (5-1/4"); $4.49 (3-1/2") plus flat shipping charge; larger quantities slightly lower in price. Software categories include: Accounting and Finance; Communications; Database Programs; Educational; Games/Adventure/Simulations; Graphics and CAD; Languages (Assembly, C, C++, dBASE III/IV, Turbo Pascal); Utilities; Word Processing; and Desktop Publishing.

National Collegiate Software
(formerly Duke University Press)
William C. Brown
2460 Keper Blvd.
Dubuque, IA 52001

Phone: 1-(800)-338-5578; FAX: 1-(800)-346-2377

For DOS microcomputers and the Macintosh but most of the programs are for DOS. While not shareware, these programs are mainly written by academics and programmers and sold to academics at low prices. Typical prices are $35-$50/program plus shipping; site licenses and institutional affiliations are available. Faculty and students receive 20% educational discount on single copies and 40% discount on three or more copies of the same item. Software includes: Datasets (nations, U.S. economic, U.S. crime, state data) in DOS and Mac versions; Economics and Business (models and simulations and research aids and tutorials—mainly in DOS); Geography and Mapping; History; Bibliographic Tools; Political Science (simulations); Psychology; Research Methodology and Statistics; and Sociology.

Gemini Marketing, Incorporated
P.O. Box 640
Duvall, WA 98019-0640

Phone: 1-(800)-346-0139 (24-hour ordering); 1-(206)-788-4295 (information); FAX: 1-(206)-788-0717

Catalogs ($1) available for: IBM-PC and compatible (by far the best selection); Macintosh; Amiga; Atari SI and 8-bit; Apple II; Commodore C64/128. Disk prices depend on the computer. E.g., IBM $3 per 5-1/4" disk (3-1/2" $4) and Mac $6.99 per disk for 1-9 (lower in larger numbers)

Inviting Faculty to Submit Syllabi to the APSA's Political Science Course Syllabi Project

supported by a grant from The Fund for the Improvement of Post Secondary Education

The Association has a project to identify and distribute exemplary course syllabi. In the 1990-91 academic year, syllabi were being collected for five introductory courses in political science. In 1991-92, we are seeking syllabi for four subfield courses and for the senior seminar/capstone course in political science. A list of these five courses and the editors of these collections follows.

Course Titles and Editors

Public Law
Lief Carter, *University of Georgia*
  Public Law includes courses in:

a. constitutional law;
b. legal and interpretive theory;
c. legal/judicial politics and process;
d. judicial behavior and decision making.

  Public Law excludes courses in such applied fields as criminal justice.
  We particularly hope to receive syllabi describing unconventional teaching features, e.g., mock litigation and field observation.

Political Methodology
John R. Freeman and W. Phillips Shively,
University of Minnesota
  We are interested in syllabi for courses which teach research design and quantitative and/or qualitative methods. The best syllabi will be those which marry substance and method, that is, syllabi which teach students how to *apply* quantitative and/or qualitative methods in the study of important political questions.

Public Administration
Naomi B. Lynn, *Sangamon State University*
  Courses that survey and introduce students to the field of public administration.

Political Behavior
Nancy H. Zingale, *University of St. Thomas*
  Courses in the general area of political behavior—public opinion, voting, participation, political psychology.

Senior Seminar/Capstone Course
Ronald Kahn, *Oberlin College*
  Syllabi of courses, outlines of processes, and/or major requirements that are used as a "capstone" experience for political science majors.

Criteria for Selecting Syllabi

  A syllabi collection for each course will represent diversity in: scholarly perspectives, themes, instructional strategies as well as institutional settings, teaching environments, student populations and academic calendars.
  To submit syllabi to the project, send two copies of a course syllabus by February 1, 1992, to:

Political Science Course Syllabi Project/APSA
1527 New Hampshire Avenue, N.W.
Washington, DC 20036

Inviting Applications

An APSA College Faculty Seminar Japan: A Comparative Perspective

Directed by Kent Calder, Princeton University in Conjunction with the 1992 APSA Annual Meeting in Chicago

Supported by a Grant from the Japan-United States Friendship Commission

Theme

  The seminar is an intensive introduction to Japanese politics for faculty who wish to include comparisons with Japan into courses in comparative politics or American politics. Participants will receive materials and guidelines for teaching about Japan.

Schedule

  The seminar sessions will be scheduled on Wednesday, September 2, and Thursday, September 3. Seminar participants will then attend Annual Meeting panels on Japanese and comparative politics, from September 3 through September 6, 1992.

Support

  There is a $750 stipend to support the travel and living expenses of seminar participants. The APSA will assist participants in securing economy plane fares and making hotel reservations for the Annual Meeting in Chicago.

Applications

  Faculty who wish to participate in the program should apply by sending a curriculum vitae and a letter:

1. describing how participation in the seminar will be used in designing course syllabi and presentations, and
2. other benefits anticipated from participation in the project.

  Applications should be submitted by March 15, 1992, to:

Japanese Politics Seminar/APSA
1527 New Hampshire Avenue, N.W.
Washington, DC 20036

plus $4 shipping. Purchase orders (net 30 days) for amounts over $50 are accepted from government institutions, schools, and hospitals. Prices outside of the United States may be higher. Shareware and public domain programs are available for such topics as: Business and Accounting; Database Management; Educational; Games; General Applications; Graphics; Music; Programming; Spreadsheet and Utilities; and Word Processing.

PC-SIG
1030 D East Duane Ave.
Sunnyvale, CA 94086

Phone: 1-(800)-245-6717

Shareware and public domain for IBM, Mac, Apple and others. Many older programs stay in their catalog. Topics include most of those listed above for the other suppliers.

Student Versions of Commercial Programs

Some well-known commercial manufacturers offer student versions of their programs. These relatively low-cost products perform in a manner identical or similar to their full-featured siblings except that the student versions have been hobbled. In the case of the statistics packages SPSS and SYSTAT (the student version is called MYSTAT), the maximum number of variables that can be handled has been reduced. In the student versions of these programs and another statistics program called NCSS, advanced features such as high resolution graphics have been left out. What remains in all three cases are powerful teaching tools sold at prices lower than or equal to those of textbooks. They come with manuals that range in quality from good to superb.[3]

Despite the high quality of some student versions, a number have been so severely limited that they are nearly useless even for teaching purposes. Because of this, even those familiar with the commercial program should test the student programs before adopting them for classroom use.

American Political Science Association Software

The Association has been involved in computer teaching assistance for many years through its SETUPS programs. More recently it has been encouraging microcomputer programming for political science classrooms through POLI-WARE, and there is a Computer Users Section of the Association.

SETUPS

Supplementary Empirical Teaching Units in Political Science, or SETUPS, offer a wide variety of analysis exercise-oriented materials tied to specific topics such as the role of gender in American politics, congressional campaign financing, and analyses of specific presidential elections. They generally assume that SPSS will be the statistical package used for the exercises. Initially designed for use on main frame computer, the newer SETUPS are available for the microcomputer.

POLI-WARE

The APSA also offers simulations appropriate for classroom use through its Political Science Simulation Library or POLI-WARE program. The first set of materials available were developed by Stephen Frantzich for use in the basic American government course or upper division courses as homework assignments. There are six decision-making simulations: Political Redistricting; Political Campaigning; Legislative Coalition Building; Judicial Process; Public Opinion Polling; and Presidential Popularity. All the simulations introduce students to the decision-making context specific to topic area. The student makes decisions and reacts to the consequences of those decisions. Each simulation is sold separately with site licenses available.

The simulations run on the IBM-PC and compatibles with 128K of memory and will work on a two floppy drive system or with a hard disk and one floppy. They are of excellent quality, easy to use, and come with full documentation.

Computer Users Section

The Computer Users Section is one of the newer sections of the Association. It publishes a Newsletter that includes reviews of recently released software and general information on hardware and computer databases. The Newsletter is sponsored by the *Social Science Computer Review* and therefore taps into that journal's information sources. The materials reviewed cover software in all cost ranges and categories. The main emphasis is on software of interest to experienced computer users. The *Social Science Computer Review* published by Duke University Press is another excellent source of such information.

Developing Your Own Computer Exercises

A variety of sources are now making data available on disk for class and research use. With such material one can develop exercises appropriate to a specific class. An example of data available on disk is *Facts and Figures on Government Finance: 1990 Edition,* published by the Tax Foundation through the Johns Hopkins University Press. It presents federal, state, and local spending and tax data and is available in hardcover, paperback, and diskette form. The diskettes are available in IBM (5-1/4" or 3-1/2") and Macintosh formats for approximately $200.

If your department or library does not have the funding to purchase such materials, there are many public records that may be used. For example, in voting behavior and political behavior courses, we have introduced students to data analysis using aggregate voting statistics and census data. The students input data into the computer using a statistical package or spreadsheet with each student covering a different election. The separate data inputs may then be combined into a master file and used for data analysis by the entire class. The same file is saved for future use.

In public budgeting, we introduce our students to a spreadsheet program and the MYSTAT statistical package, which they then use for forecasting. We take them through various forecasting techniques in

order to show the students the impact of using each technique. Budgetary data for your state could be collected for such an exercise.

Our undergraduate research classes develop and administer their own questionnaire. The resulting data are inputted to computer and analyzed by the class. The data are then saved and used as example material and for exercises in other research classes.

Our own research files are also cycled into our teaching. We input all of our data using a spreadsheet. This allows us to input the data into various statistical packages for analysis purposes and into word processing packages for exercise develop-

ment. Using our data has two advantages: (1) we already have a large amount of analyzed material making exercise development relatively easy; and (2) by tying the materials to our own research in class discussion we give practical reinforcement to the importance of research in political science.

Overall, the use of the computer should be presented as an enjoyable activity, not a chore. The computer should be treated as a convenient, time-saving tool that is there to assist the students. An instructor with a positive approach will find that teaching with the computer can be fun.

Notes

1. This article expands on Anne Permaloff's presentation "Using Computers in the Classroom," Innovations in Teaching Political Science Roundtable, Western Political Science Association Meetings, Seattle, WA, March 1991.

2. SimCity: The City Simulator, MAXIS Software, 1042 Country Club Drive, Suite C, Morgan, CA 94566. Available for IBM, Tandy, and compatibles. Runs best on a hard disk but will operate on two 5-1/4" 360K floppies.

3. For an examination of these and other relatively inexpensive student statistical packages, see Anne Permaloff and Carl Grafton, "Student Statistical Packages," PS: Political Science & Politics, XXIII, 1 (December 1989), 820-31.

Winning Is Not the Only Thing "On the Campaign Trail": An Evaluation of a Micro-Computer Campaign Simulation

Nadine S. Koch, California State University, Los Angeles

"On the Campaign Trail: The Ultimate Campaign Computer Simulation" is a microcomputer simulation developed by Fishel and Gopoian for their political campaign management program at Kent State University. The simulation engages the user in a multitude of decision-making activities related to a U.S. Senate campaign by two candidates vying for an open Senate seat in the fictitious state of Tarragon.

Gopoian, Fishel, and Stacey (1987, p. 10) state that the overall teaching goals of the simulation are:

1. to provide students with the opportunity to explore the works of Benjamin Page, Stanley Kelley, and Thad Mirer;
2. to provide students with information about U.S. Senate elections between 1970 and 1986 and the key factors that seemed to shape those races;
3. to provide students with insights into high-level campaigns;
4. to sensitize students to the elements and the process of strategic thinking in political campaigns;

5. to facilitate student awareness of the constraints of public opinion on candidate behavior;
6. to allow students to understand the relative importance of money in political campaigns; and
7. to permit students to experience interpersonal cooperation and/or conflict in team decision-making.

This paper will first describe the simulation package, explain how it was used in an upper-level political science course, and lastly, will present evaluations by me and the students of the software and pedagogical value of the microcomputer simulation. These evaluations will address many of the aforementioned teaching goals.

The Simulation

The student simulation package consists of three items: one floppy diskette; a 124-page book containing information on U.S. Senate campaigns (incumbency factor, partisanship, political climate of the states,

campaign spending, the economy and the vote, etc.), campaign strategies, background information on the state of Tarragon, and instructions on how to play the simulation, including detailed information on the activities listed below; and worksheets to help in planning and implementing the candidate's campaign strategy.

The simulation uses data from the Center for Political Studies 1984 National Election Study. The national voting data have been disaggregated so that each of the 30 counties in Tarragon exhibits a particular demographic and electoral profile. For example, some counties are heavily Republican while others are Democratic strongholds. Some have moderate voting turnouts while others have low or high turnouts. Blacks and Hispanics are represented in some counties and are virtually absent in others. Counties also vary according to the socioeconomic status of their voters. Media viewing habits of the individual voters differ according to their sociodemographic characteristics. In sum, the simulation attempts to replicate the behav-