

USING COMPUTERS IN
LOWER DIVISION HISTORY COURSES

Fred R. van Hartesveldt
Fort Valley State College

Technology has often produced educational innovation. One can imagine a medieval professor fretting that by making books cheap and common the printing press was going to take away his livelihood. In the 1960s the technical threat to professorial security was television. Today it is the computer. It does not seem to me, however, that the computer is more than a tool that can help in teaching just as technical innovations have in the past. Unfortunately historians and their students have and often continue to regard computers with distrust and suspicion.

Those historians who have begun to quantify their research have also begun to use the computer for teaching. They have successfully involved students in research projects that include statistical analysis of numerical data such as census reports. This is a valuable technique because it involves students in the process of historical study, but it calls for a level of interest and knowledge that many of us do not find among our pupils. Reports of such projects include remarks like "any standard one- or two-volume text will provide an introduction to the general skeleton of American history."¹ Several more specialized volumes are then necessary to zero in on the topic to be investigated.

Most historians are faced most of the time with bored, uninterested students who are taking the course because it is required. They will drop the course and take another instructor next term or, if in a Chinese menu curriculum--i.e. one from column A and two from column B--just avoid history, rather than read several books on the promise of a fascinating research project to come. I am finding that by using simpler kinds of computerized instruction the interest of such students can be caught; they can be led into learning some basic ideas and facts, and I hope, in at least a few cases, led into more advanced courses and more sophisticated projects. The computer offers three fairly easily created types of programs for such students: tutorials, guessing games, and simulations.

Such programs are used at a few universities, but they have not been widely discussed within the profession.² The History Teacher, one of the major periodicals concerned with instruction in history, has in the last decade published five articles about quantified research projects, several on the use of classroom games, and one on bibliographic data bases, but none on computerized tutorials or games.³ The other major journal in this area, Teaching History, has not in the same period concerned itself with the use of computers.

The use of tutorial, game, and simulation programs offers several advantages. Generally they are fun, and although--"Seasme Street" notwithstanding--learning cannot all be fun, it helps if some parts can. The machine has infinite patience in tutoring, while few professors have time to sit down with each of their students and go through a series of questions to see if there has been adequate preparation. With games and simulations there is a competitive factor, and desire to beat the machine can be exploited.⁴ The program may even include an occasional mild taunt at a student who has not studied enough to handle the questions of a mindless machine. While care is needed to avoid reinforcing a sense of failure, properly done this can be quite a spur. It certainly draws many an extra quarter in the arcades.

Programs can easily be made to be, in the jargon of computer scientists, interactive. This means that the user is asked for his name and addressed by

it thereafter. His sense of personal involvement and/or competition is enhanced (see lines No. 50, 60, 70, 280, 400, 470 in the appended sample program). The program can also be written to keep score and give an immediate response that varies according to the user's score (see lines No. 440-470 in the appended sample program). The score can be simply based on the ratio of right and wrong answers or, if the program doubles back to re-ask missed questions, on the number of attempts required to answer all of the questions. Although the programming is a bit more elaborate, the computer can be instructed to store the name of each user and his score for each time he runs the program. The professor can then check on who used the program and how well each person did by having the machine print out the records.

Other advantages are that games and tutorials help get a student accustomed to learning at a terminal and can provide a great deal of information. The amount of data the computer will produce is limited only by the professor's time and energy for typing it into the memory along with instructions about when to print it back out. Errors can be corrected and right answers explained (for instance see line No. 280 in appended sample).

Fort Valley State College students have responded very positively to information in this form, frequently asking that courses include more work with the computer.⁵ This response does not suggest, however, that computers will take over education. Many of us enjoyed books and still needed our instructors. The very best students have always been able to use books and other aids to learning with relatively little instruction or encouragement, but the vast majority need guidance and explanation. Furthermore, the machine can never supply the lesson, and no matter how complete or sophisticated the data base, it can provide education only if you asked the right questions. Tutorials and games that help teach basic information can free instructional time for dealing with the key questions.

I initiated computer-assisted instruction in required survey history courses in the winter of 1982--some departments, notably Developmental Studies, had already done so--and was joined by two of my colleagues. Tutorials have been used in sections of U.S. history with significant success. Students have shown greatly increased learning, and they have been so pleased that I had to hear from several sections before I really believed them.

The tutorials have been used in two ways: in combination with reading assignments in the text to make the initial presentation of some sections of the course material and as a review for examinations. In the former case quizzes in class were used to check on the students' progress. In four classes (the number in the classes ranged from 18 to 34) under two different instructors average grades on quizzes with computerized material rose dramatically, in one case by 20%.⁶ In the course in which the computer assignments were used to review for examinations, the average grade rose from 69.7 to 79.2.⁷ In both situations, informal checking among students who did particularly badly on the computerized material revealed that they had not gotten around to visiting the computer center to try the tutorial. Overall the results indicate that virtually all the students did the assignments and profited from them. There was little report of difficulty in gaining access to computer terminals. Although at the time the computer lab had only twelve, its hours were long--fourteen a day during the week plus weekend hours--classes reached the assignment at slightly different times in the quarter, and some students seemed to have access to terminals in campus offices. Despite a tripling of the number of terminals over the last two years, competition for use has become an increasing problem.

The simplified program appended at the end of this article is a sample, and it will run, without minor changes, only on systems using the same version of BASIC in which it is written (Standard BASIC is used throughout the University of Georgia computer system). Those who do not know BASIC should keep several things in mind when reading it. First, only lines beginning with the command word "Print" appear on the screen, and except for variables, only and exactly (including spaces) what is in quotation marks appears. Second, the command "Input" causes a question mark to appear on the screen and the computer to wait for information before continuing the program. Third, for the sample, responses to student answers have been kept to a minimum as in lines 280, 400, 410, 11030, and 11040. These can be expanded with as many print statements as desired. Fourth, the variation in responses based on random number value (line 11010) may be done any time it is desirable to have such variation. Doing so seems to help keep students' interest fresh.

Keeping the above in mind, the program can be read as a series of instructions to the machine (the lines at the beginning with the command "Rem" are for the information of the programmer and do not affect the operation of the program). It starts with instructions for the student (lines 40-130) and then establishes the initial values for the variables, X and Y, that will increase each time a question is attempted and for each correct answer (lines 140 and 150). Then the questions are asked (lines 170 to 230 and 290 to 350). Of course, more questions and answer choices may be added by following the model. As the response to correct answers is just praise, a subroutine (lines 11000 to 11050) is used to avoid writing the message again and again. If an explanation of correct answers is desired the machine can be directed to the proper lines by either the "If . . . then" or "Go to" commands. Lines 250 and 370 in the sample do this for incorrect answers, and they also route the machine around the instructions it is not to follow if the answer is correct (the "If" command is followed only when the specified condition is met--in this case when the answer entered is not the correct one). Finally there is the scoring which gives the student immediate feedback. In the sample program there is only one division of scores (lines 11010-11040), but I often use one for each of the usual letter grades. This is done by using the "Greater than" and "Lesser than" commands and directing the computer to the appropriate message. For instance, one may say if the score is equal to or greater than 90 go to a particular line where there is a print statement for an A student. (If S = >90 Go to 540.)

Encouraged by their initial success, Fort Valley State historians are introducing new activities. Currently being placed into memory are a series of games similar to what children call twenty questions. The student is asked a question or to identify some person or event. As a succession of hints make the question easier to answer, the point value decreases. Each wrong answer draws a new hint till the game is lost and the answer revealed by the computer. Although more fun for the student, these are more limited than the tutorials in that once the answer is learned the suspense is gone. Like the tutorials, the games can be interactive and the score kept if desired.

We are also developing a simulation based on slave life in the Old South because The Slave Community by John Blassingame is required reading in all sections covering the first half of U.S history.⁸ The simulation will describe a variety of situations that a typical slave could have faced and expect the student to decide how to resolve the problems. Like the real slave his object will be to avoid punishment while having the best life possible. The player will win or lose points according to whether his solutions work. If he sticks to the safe but submissive course, he can be

fairly certain to stay in the game but he will not get many points. A dangerous solution, if it works, will produce many points but will be more likely to result in punishment and hence the loss of points. The odds against a solution like open rebellion can be set by basing the chance of success on the value of a random number. In this way the student who decides on open rebellion can be rewarded if it works but not have much chance of success.

The simulation will do more than just encourage reading by providing a fun reward at the end. It will force a student to look at the problems that a slave faced and to consider the options that existed. If he can be involved in the game, the realities of the past will become more vivid than they are on the printed page. If Pac Man can create tension by gobbling dots, the effort to keep a simulated character alive and well, while dealing with the temptation to risk all in a bid for freedom and victory in the game, should too.

I have chosen, for a variety of reasons, to learn enough programing to prepare class projects myself. There is some software on humanities and particularly history available, but by writing my own programs, I can adapt the computer work to the materials and syllabuses of our courses.⁹ Since common syllabuses are used for lower division courses at Fort Valley State, a program can serve several sections at once, and so the work of preparation can be shared. I have worked in the very simple computer language called BASIC rather than any of those specifically designed for computer-assisted instruction or CAI.¹⁰ I have done so because I preferred flexibility to convenience. CAI languages such as AUTHOR and TUTOR impose some restrictions on question length and structure.¹¹ Such languages do, however, allow someone with very little knowledge of programing to prepare tutorial programs. They also reduce the time needed for preparations. Many teachers, particularly if they have no desire to get involved in more sophisticated use of computers, may prefer the CAI languages.

As Fort Valley State College is part of the University System of Georgia, I have used the system's computer network. This is convenient and permits access by many students at the same time. A school not connected to such a system could, however, do the same projects, though not some of the statistical analysis ones, with microcomputers or a minicomputer whichever is available. Most of these will accept at least one of the CAI languages as well as some version of BASIC.

As the United States moves through that part of the educational cycle in which science and technology are the most highly emphasized subjects, historians have a major challenge to meet. Introductory courses become more important than ever because most students will not take any others. If the educated population is to have the benefits of an understanding of historical development, the basis must be laid in the one or two courses the majority will take. If computer-assisted instruction can significantly increase what is learned in basic courses, and I believe it can, then historians would be foolish indeed not to use it. A second challenge is to get at least a few students to take upper-level courses. Given the employment outlook for humanities graduates, history majors will be few, but if students learn enough in required courses to begin to see how a knowledge of history opens their understanding of the world, they may be sold on some history electives or even a minor. To get students this far requires making courses both stimulating and enjoyable. I think that creative use of the computer can do both.

APPENDIX

Sample Tutorial Program

```
20 Rem Variable identification: X is number attempted; Y is number
30 Rem correct; N$ is student's name; S is score; A is answer.
40 Print "Hello. You are about to do a tutorial program on your"
50 Print "assignment in history. When you see the ?, type your name."
60 Input N$
70 Print "Very good. "N$". You will now be asked a series of questions."
80 Print "When you see the ? after the question, type the number of"
90 Print "the correct answer. You will be told if your answer is"
100 Print "right or wrong. Incorrect answers will also result in"
110 Print "a reading assignment in the text and/or an explanation of"
120 Print "the error. When you have finished the program, you will"
130 Print "be given your score and a suggestion about more study."
140 Let X=0
150 Let Y=0
160 Print "Question No. 1"
165 Let X=X+1
170 Print "Theodore Roosevelt was nominated for Vice-President"
180 Print "in 1900 because"
190 Print "1) New York Republican bosses wanted to get rid of him"
200 Print "because he was pushing for reforms in that state."
210 Print "2) the national Republican Party wanted a"
220 Print "strong reformer to balance McKinley's conservatism."
230 Print "3) most Democrats liked him."
240 Input A
250 If A <> 1 Go to 280
260 Go sub 11000
270 Go to 290
280 Print "Sorry, "N$". You missed this one. See page 26 in the text."
290 Print "Question No. 2"
300 Let X=X+1
310 Print "Theodore Roosevelt became President when McKinley was"
320 Print "assassinated by"
330 Print "1) Charles Giteau."
340 Print "2) Sirhan Sirhan."
350 Print "3) Leon Czolgosz."
360 Input A
370 If A <> 3 Go to 400
380 Go Sub 11000
390 Go to 420
400 Print "Be alert, "N$". You just missed one that only called for"
410 Print "a bit of memory work. See page 28 in your text."
420 Print N$" you've just completed this assignment. Let's see"
430 Print "how you did."
440 Let S=Y/X*100
450 If S > 79 Go to 470
460 Print N$", your score is "S"%. You seem to need some more study."
470 Print "Good, "N$". Your score of "S" shows that your studying"
475 Print "is paying off."
480 Go to 11060
11000 Let Y=Y+1
11010 Let P=RND(10)
11020 If P=>5 Go to 11040
11030 Print "That's right, "N$". You got it."
11035 Go to 11050
11040 Print "Excellent, "N$". Very good!"
11050 Return
11060 End
```

NOTES

¹Orville V. Burton, "Using the Computer and Manuscript Census Returns to Teach American Social History," The History Teacher, XIII (November, 1979), 78; 78; for another example see Elaine Keuhn, "Demythologizing the Modern European Family with Quantitative Data," ibid., XV (February, 1982), 168-69.

²Robert G. Schafer, "Computer in the [History] Classroom," A.H.A. Newsletter (October, 1977), 9-10.

³In addition to articles in Note No. 1 see James Whittenburg, "The Computer as a Teaching Aid: A Report on Two Class Projects," The History Teacher, IX (May, 1979), 433-42; Michael P. Weber, "Quantification and the Teaching of American Urban History," ibid., VIII (May, 1975), 391-402; Robert S. Feldman, "A Manual Retrieval System Using Computer Punch Cards for Qualitative Historical Research," ibid., VI (May, 1973), 383-85; Clair Keller, "Role Playing and Simulation in History Courses," ibid., VIII (August, 1975), 373-89; Michael McCarthy, "Teaching Urban History with Games," ibid., VII (November, 1973), 62-66; Joyce D. Falk, "In Search of History: The Biobio-graphic Data Bases," ibid., XV (August, 1982), 523-44.

⁴Schafer, 9-10.

⁵Surveys of classes using computer tutorials taken by Donald L. Grant and Fred R. van Hartesveldt show an approval rate of 90% or better.

⁶These comparisons were made on sections of U.S. history taught by Donald L. Grant and Fred R. van Hartesveldt in the Winter and Fall Quarters of 1982.

⁷This class was a section of U.S. history taught by Lee Pendergrass, Fall Quarter, 1982.

⁸John Blassingame, The Slave Community, Rev. ed. (New York and Oxford, 1979).

⁹The McKilligan Supply Corporation has a catalog, free to schools, of educational software. Write to 435 Main Street, Johnson City, New York, 13790. There are of course many other sources of such material.

¹⁰An introduction to BASIC can be found in Joseph W. Vles, Computer Fundamentals for Nonspecialists (New York, 1981), 79-96; or Donald D. Spencer, Introduction to Information Processing, 3rd ed. (Columbus, Toronto, London, 1981), 372-97.

¹¹Gordon Schleicher, "Authoring Systems Can Save Time in Development of CAI," Electronic Education, II (November, 1982), 20, 27.