TEACHING HISTORY THROUGH COMPUTERIZED SELF-TESTING: WHETHER AND HOW TO DO IT (INEXPENSIVELY)

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This paper, following an introductory summary of ways computers are used in education, focuses upon computerized, student-administered quizzes as teaching aids. It has the practical purpose of providing a step-by-step procedure for using a popular word processing program to prepare quizzes for running in an inexpensive, commercially available testing program.

Computers in Education: CAI, CBT, and CMI

Quizzes administered by computer can constitute a form of computer-assisted instruction (CAI). Common types of computer-assisted instruction,[1] include drill and practice, tutorial, demonstration and simulation, game format, word processing, numeric analysis (spread sheet), and data processing programs. To these can be added two types of computer-based testing (CBT), which has been described as "the next step beyond CAI technologically."[2] In the first type, which serves strictly administrative purposes, the teacher is not informed of test scores; in the second type, the instructor is given the test scores and may tailor his teaching accordingly.

The second type of testing may be incorporated into a still higher level of instructional technology called computer-managed instruction (CMI). Some types of CMI amount essentially to keeping records of grades and related data. Others include the reporting of test scores to students (immediately, if tests are administered by microcomputer, usually later if otherwise), and one type makes use of an extremely potent combination of technologies called "multi-sensory CMI." An example of multi-sensory CMI is the PLATO courseware, which depends about 60 percent upon CAI and 40 percent upon such media as video and audio tapes, films, and printed materials.[3] Developed with U.S. Government support in connection with several universities, PLATO provides highly-regarded courses for independent study at high school, technical school, and college levels.[4]

Computerized Self-Testing in College History Courses With IBM's Teacher's Quiz Designer

Whether a teacher should employ computerized self-testing or any other form of computer-assisted instruction in college history classes depends partly upon personal preference[5] and partly upon

other considerations, both theoretical and practical, that have been addressed by educators and writers in the field.[6] At the minimum, assuming no administrative impediment, suitable equipment and software must be available, and the instructor must possess the ability and time to use them, or else must have the assistance of someone who does. Also, teachers must decide whether some part of the information or skills they wish to convey to their students can be learned through, or tested by, self-administered computer quizzes.

Computerized self-testing seems promising as an aid to instruction in some circumstances. For example, it has long been possible to administer objective tests outside of class time by computer, saving those precious minutes or hours usually devoted to quizzes for some activity that is deemed more productive of learning or that must be done in the classroom situation. This can be accomplished, with an immediate report of results to the student and a permanent record of the grade for the instructor, if computer labs are scheduled to serve at certain times as testing centers, or better yet, if dedicated testing centers are established with appropriate monitoring.[7]

Without a full-scale computer lab, with only one or a few computers available, instructors can still use computer-administered tests to a limited degree as make-ups for individual students who missed a regular quiz, for students taking directed study courses, or for those in a regular course who wish to depart from the line of study followed by the rest of the class and pursue knowledge in some area of their particular interest. Similarly, such tests can be constructed to test specific competencies outside of class time, such as library orientation, grammar usage, aspects of historiography, and mechanics of documentation.

Computer-administered tests may also be used as practice quizzes in some classes with apparently good effect, much as they are employed by students preparing for standardized tests such as the Scholastic Aptitude Test.[8] The experiment under consideration began with experimental voluntary practice quizzes in United States history survey classes about three years ago. The main purpose was to induce students to read textbook assignments more carefully, help them understand the material better, and bolster student confidence of in their knowledge.[9] The ultimate goal was more learning and better grades. Encouraged by the response, the system was extended to other survey courses.

Students liked the practice quizzes. In the Fall Quarter of 1987, on anonymously completed evaluations of a survey course on the history of civilization, 40 out of 59 students made complimentary

statements about the computer practice quizzes, and no student commented unfavorably about them.[10] Most described the practice quizzes as "very helpful" or said they "helped a lot," but one stated he "would have failed except for computer quizzes." Another observed that the "computer quiz gave a better understanding of each chapter. A lot of things were discussed that may have been missed while reading the chapter." Still another declared, "the computer quizzes are great."[11] Such student remarks do not, of course, carry the conviction inherent in a scientific study, but the positive comments from students, perceptibly improved test grades for those using the practice quizzes, and increased visibility of textbooks in the arms of students attending class, leave the impression that this technique is worth using.

The IBM Personal Computer (IBM PC)[12] and an IBM program called Teacher's Quiz Designer (TQD)[13] were the means by which practice quizzes for each chapter assigned in the textbook were made available to the students. Questions used were a portion of those supplied by the text publisher,[14] some items being reserved for inclusion on printed quizzes given for credit.

Teacher's Quiz Designer's retail price is less than a hundred dollars. Another advantage is that, because it is written in the Basic language and most of its routines can be printed out, it can be modified for special applications.

Considering its low cost, TQD is surprisingly powerful. It can be used for creating, printing, and administering multiple-choice, true-false, or fill-in-the-blank tests as long as 250 lines (about 50 multiple-choice items). Test banks, from which questions for quizzes may be selected electronically, can be much longer. Quizzes can be locked at two levels with password protection for security, shuffled to create multiple versions, listed on screen or printed on paper (with correct answers either marked or unmarked), added to, edited, renamed, or deleted.

Several quizzes can be put on a Student Disk for use by one student or by an entire class at their convenience. Every time a student takes a quiz, TQD records his grade on the disk. TQD automatically performs item analysis, allowing the instructor to see which questions are more frequently missed. Alternatively, each student in class can have his own disk to use for the entire term, with quizzes being added and deleted one (or more) at a time as they are needed. To deal with the latter situation, TQD has a "collect" function that combines all of the grades and item analyses from all of the student disks and produces an overall statistical analysis for the class, or for several classes as the case may be.

TQD is also relatively easy to use. Essentially, everything is done from two menus, the Main Menu and the Teacher's Menu. From the Main Menu one chooses to create or add to a quiz, edit a quiz, list an index of quizzes on the disk, list or print a quiz, run a quiz, or go to the Teacher's Menu. A password is required to reach the Teacher's Menu, which offers fourteen choices of things to do with or to an existing quiz. One of those, "Select quiz options," has a submenu that, for example, enables the instructor to set the time allowed for students to answer questions, give students a second or third chance to answer correctly (if it is a review quiz), and have the computer give an audible response to correct answers.

TQD's main disadvantages are its slow speed and the awkwardness of typing quizzes into the program initially, especially when corrections have to be made. Fortunately, the latter problem can be overcome and the former minimized by using a word processor to type the quizzes in TQD format and edit them. The remainder of this paper will show how to do this, using the popular word processing program, WordPerfect (WP).[16]

WordPerfect to Teacher's Quiz Designer
For the IBM PC and Compatibles

This procedure uses WordPerfect to type a quiz for use in the Teacher's Quiz Designer program. It can also be adapted to convert to the TQD format an exam previously typed and stored on disk in WordPerfect or other formats. Some familiarity with the IBM PC or compatible computers, the operating system PC DOS, WordPerfect, and Teachers Quiz Designer is helpful.

Two diskettes, a WordPerfect program diskette and a formatted document diskette will be needed during the WordPerfect operations, and a TQD diskette[17] will be required during the TQD operations. The TQD disk can double as the document disk, however, as long as it is not overfilled. This will avoid the necessity to copy the quiz from a separate document disk to the TQD disk later on (Step 11).

WORDPERFECT OPERATIONS

1.	With DOS operating and A> displayed, insert the WordPerfect program disk in Drive A and a document disk in Drive B; log to Drive B by typing **B:[ENTER]** and type **A:WP[ENTER]** to install WordPerfect.

The quiz file to be created in Word Perfect must be stored on the document disk as **a DOS text file** (Step 8) before TQD operations are done. The filename extension must be "**qiz**," as required by TQD. (For example: SCIREV.QIZ.)

2. In WordPerfect, set margins at 0 and 220 **(SHIFT--F8, 3)**.

Teacher's Quiz Designer uses a 220-character line as the maximum length for each question, answer, or instruction. Since the screen displays only 80 characters per line, a TQD line will often continue past the edge of the screen and, when printed on paper, often takes two or three lines.

When typing the quiz, to avoid multiple errors in TQD, **DO NOT** strike ENTER or CARRIAGE RETURN except at the end of a (220 character max) line.

3. For easier and faster typing, define temporary symbols to be used while in WordPerfect. The longer the quiz, the more time this saves.

After typing the quiz in WP, the Global Replace command will be used (Step 7) to replace these temporary symbols with the TQD symbols that would ordinarily be applied with the function keys when operating in TQD.

For example, use these temporary symbols:

\\	=	instruction	(In TQD, F5 writes /I /-.)
<	=	question	(In TQD, F2 writes /Q /-.)
*	=	wrong answer	(In TQD, F4 writes /Aw/---.)
**	=	right answer	(In TQD, F3 writes /Ar/---.)

NOTE: Hyphens represent spaces made with the space bar.

4. Type the title of the quiz (38 characters maximum) on the first line (Line 0 in TQD), and, using the space bar, install blank spaces beyond column 54. For example:

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* = wrong answer (In TQD, F4 writes /Aw/---.)

** = right answer (In TQD, F3 writes /Ar/---.)

NOTE: Hyphens represent spaces made with the space bar.

4. Type the title of the quiz (38 characters maximum) on the first line (Line 0 in TQD), and, using the space bar, install blank spaces beyond column 54. For example:

HIST 101 SCIENTIFIC REVOLUTION QUIZ 041588

The blank spaces to the right of the title are necessary for TQD to install a number code essential to operation of the program. This code will indicate the number of lines in the quiz and determine whether the quiz is locked by TQD. Without the code, TQD will not list, edit, or run the quiz.

There must be no blank lines preceding the title or anywhere in the quiz; if there are, TQD will detect multiple errors.

5.   On the next line after the title (Line 1 in TQD), type instructions for taking the quiz or information about the quiz. For example:

\\MULTIPLE-CHOICE: Indicate the MOST correct response to each item.

6.   On the next line after the instructions (Line 2 in TQD), type the first question. Continue as in the example following:[18]

HIST 101 SCIENTIFIC REV QUIZ 041588
\\MULTIPLE-CHOICE: Indicate the MOST correct response to each item.
<Who is credited with first stating the Law of Universal Gravitation?
*Frederick Jackson Turner
**Isaac Newton
*The man who constructed a practical telescope, made fundamental discoveries through observation of heavenly bodies, and explained mathematically the behavior of falling bodies.
*Garibaldi
<Seventeenth century European philosophers often disagreed about the best approach to knowledge, some favoring empiricism and others rationalism. The best known 17th-century rationalist was
*Newton
*Galileo
**Descartes
*Plato

7.   Move the cursor "Home" and use Global Replace (ALT--F2)

to replace temporary symbols with TQD symbols, as follows:

Replace \\   with   /I /-   (Instructions)

Replace <   with   /Q /-   (Questions)

Replace *   with   /Aw/--- (Wrong Answers)

Replace **   with   /Ar/--- (Right Answers)

CAUTION: Replace Right Answer codes prior to wrong Answer codes if the same symbol is used for both right & wrong answers, as in this case.

After this operation, the quiz should resemble the following:[19]

HIST 101 SCIENTIFIC REV QUIZ 041588
/I / MULTIPLE-CHOICE: Indicate the MOST correct response to
/Q / Who is credited with first stating the Law of Universal /Aw/
Frederick Jackson Turner
/Ar/ Isaac Newton
/Aw/ The man who constructed a practical telescope, made /Aw/
Garibaldi
/Q / Seventeenth century European philosophers often disagreed
/Aw/ Newton
/Aw/ Galileo
/Ar/ Descartes
/Aw/ Plato

8. Save the quiz as a DOS text file (**Control--F5**) with suffix "qiz." (For example: SCIREV.QIZ)

The test is now configured for TQD, except for installation of the TQD code on line 0, which is done most easily with the TQD program.

9. Exit WP for DOS. (**F7 N Y**)

TEACHER'S QUIZ DESIGNER OPERATIONS

10. Install TQD disk in Drive A, replacing the WordPerfect program disk, and log to Drive A.[20] (A:[ENTER])

11.   Copy the new quiz file from the document disk to the TQD disk (if the test was not built and saved on the TQD disk). (For example: COPY B:SCIREV.QIZ A:)

12.   Install TQD code on Line 0 and check new quiz file for correct operation in TQD, as follows:

   a.   Type letter "g" and [ENTER] [To get TQD Main Menu]
   b.   Select "C" from Main Menu [Create/add to a quiz]
   c.   When prompted, type the name of the newly created quiz as "current quiz."   For example: SCIREV [Filename extension is not needed.]
   d.   When the prompt appears for adding to the quiz, Press F6 to mark end of quiz and install the code on Line zero.

      TQD now installs /EQ/ after the last line of the quiz, places the code on Line 0, checks for errors, and informs you of any errors that are found.   Errors may be corrected in the Edit Mode of TQD, but, if there are several, it will probably be easier to return to WordPerfect for editing. If errors prevent the quiz from being listed in TQD, editing can still be done in WP.

   e.   As a final check for proper operation of the new quiz, try running it or listing it in TQD. A good check is to select Edit Mode from Main Menu and list the quiz (all lines are automatically numbered sequentially by TQD). When listed from TQD Main Menu, as would be done for a printed exam, the quiz appears as follows:[21]

HIST 101 SCIENTIFIC REV QUIZ 041588

   MULTIPLE-CHOICE: Indicate the MOST correct response to each item.

1.   Who is credited with first stating the Law of Universal Gravitation?
   a.   Frederick Jackson Turner
 * b.   Isaac Newton
   c.   The man who constructed a practical telescope, made fundamental discoveries through observation of heavenly bodies, and explained mathematically the behavior of

falling bodies.
d. Garibaldi

2. Seventeenth century European philosophers often disagreed about the best approach to knowledge, some favoring empiricism and others rationalism. The best known 17th-century rationalist was
a. Newton
b. Galileo
* c. Descartes
d. Plato

A TQD quiz, with all codes, may be viewed by means of the TYPE command in DOS (if not locked at level 2) or by retrieving it in WordPerfect. After the TQD operations, the example used in this procedure appears in DOS with long lines wrapped, as follows:

HIST 101 SCIENTIFIC REV QUIZ 041588   12N
/I / MULTIPLE-CHOICE: Indicate the MOST correct response to each item.
/Q / Who is credited with first stating the Law of Universal Gravitation?
/Aw/ Frederick Jackson Turner
/Ar/ Isaac Newton
/Aw/   The man who constructed a practical telescope, made fundamental discoveries through observation of heavenly bodies, and explained mathematically the behavior of falling bodies.
/Aw/ Garibaldi

/Q / Seventeenth century European philosophers often disagreed about the best approach to knowledge, some favoring empiricism and others rationalism. The best known 17th-century rationalist was
/Aw/ Newton
/Aw/ Galileo
/Ar/ Descartes
/Aw/ Plato
/EQ/

The writer has found WordPerfect and Teacher's Quiz Designer, used in combination, to constitute a powerful, inexpensive,

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and relatively easy-to-use system for creating and administering quizzes by computer. Not only do self-administered computer practice quizzes aid learning, but many students, probably most, like computer-administered tests better than pencil-and-paper tests.

Computerized self-testing of students is one of the easier, simpler, more convenient applications of computer technology in the teaching field. Even so, this is one way that computers can make possible greater flexibility, more efficient use of class time, and, in the opinion of the writer, more effectiveness in the teaching of history.

WORKS CITED

Bank, Adrianne and Richard C. Williams, eds. *Information Systems and School Improvement: Inventing the Future.* Computers and Education Series, ed. Keith A. Hall. New York: Teachers College Press, 1987.

Bork, Alfred. *Personal Computers for Education.* New York: Harper & Row, 1985.

Callison, William L. *Using Computers in the Classroom.* Englewood Cliffs, N.J.: Prentice Hall, Inc., 1985.

Camp, John. and Marc Cogan. "*Hypercard*: A Milestone in Educational Computing." *Electronic Learning* (March 1988): 46-51.

Chambers, Jack A. and Jerry W. Sprecher, "Computer-Assisted Instruction: Current Trends and Critical Issues." In *Instructional Software: Principles and Perspectives for Design and Use*, ed. Decker F. Walker and Robert D. Hess. Belmont, CA: Wadsworth Publishing Company, 1984, 6-20.

Culbertson, Jack A. and Luvern L. Cunningham, eds. *Microcomputers and Education.* Part I of *Eighty-fifth Yearbook of the National Society for the Study of Education*, ed. Kenneth J. Rehage. Chicago: University of Chicago Press, 1986.

Diploma, IBM Version. Brownstone Research Group, Inc. Denver, Colorado.

Fedewa, Lawrence J. "Do Computers Help Teachers Teach?" *Search*. Washington, D.C.: National Education Association, 1987.

Ferrell, Keith. "Computers in the Classroom: Ten Years and Counting." *Compute!* 9 (September 1987): 12-28.

Garraty, John A. *A Short History of the American Nation*. 4th ed. New York: Harper & Row, Publishers, 1985.

Harcourt Brace Jovanovich, Publishers. Advertisement in *Classroom Computer Learning* 8 (February 1988): 51.

IBM Personal Computer Teacher's Quiz Designer. IBM Corporation. Boca Raton, FL. Written by John R. Marsland. IBM Part #6024075.

Moe, Kim C. and Marilyn F. Johnson. "Participants' Reactions to Computerized Testing." *Journal of Educational Computing Research* 4 (March 1988): 79-86.

Ritter, Caroline. and Judy Salpeter. "Studying for the Big Test: Software that Helps Students Prepare for the College Entrance Exams." *Classroom Computer Learning* 8 (February, 1988): 48-53.

Sloan, Douglas, ed. *The Computer in Education: A Critical Perspective*. New York: Teacher's College Press, 1985.

Student Evaluations of History 100B and History 100D, 30 November 1987, Valdosta State College. Documents in the hands of the writer.

"The 1988 *Classroom Computer Learning* Software Awards." *Classroom Computer Learning* 8 (February 1988): 28-38.

Walbank, T. Walter, Alastair M. Taylor, Nels M. Bailkey, George F. Jewsbury, Clyde J. Lewis, and Neil J. Hackett. *Civilization Past & Present*, 6th ed. Glenview, IL: Scott, Foresman and Company, 1987.

WordPerfect Ver. 4.1. Satellite Software International. Orem, Utah.

NOTES

[1]This brief explanation of CAI, CBT, and CMI is based upon William L. Callison, *Using Computers in the Classroom* (Englewood Cliffs, N.J.: Prentice Hall, Inc., 1985), pp. 10-13.

[2]Ibid., 11.

[3]An excellent chapter on computer-managed instruction systems, written in plain language with clear recommendations, is in Alfred Bork, *Personal Computers for Education* (New York: Harper & Row, 1985), pp. 74-79. "Testing is at the heart of most computer-based class management systems," he states (p. 75). Bork prefers "on-line" tests with questions selected randomly by the computer from a pool of test items or, in the case of mathematics, produced by a problem generator.

[4]Callison, *Using Computers in the Classroom*, pp. 12-19, describes PLATO and some of its variations.

[5]Lawrence J. Fedewa,"Do Computers Help Teachers Teach?," *Search* (Washington, D.C.: National Education Association, 1987), p. 29, asserts that, although the goals of computer literacy and productivity are the most common reasons given for the popularity of computer-based education, these are not sufficient explanations. The enthusiasm among both students and teachers for computers, regardless of the particular application, "suggests that there may be some psychological phenomenon. . . ."

[6]For a brief, non-technical review of the historical development of computer-assisted instruction and issues relating to CAI, see Jack A. Chambers and Jerry W. Sprecher, "Computer-Assisted Instruction: Current Trends and Critical Issues," in *Instructional Software: Principles and Perspectives for Design and Use*, ed. Decker F. Walker and Robert D. Hess (Belmont, California: Wadsworth Publishing Company, 1984), pp. 6-20. Douglas Sloan, ed., *The Computer in Education: A Critical Perspective* (New York: Teacher's College Press, 1985), contains articles by eleven scholars raising doubts about some applications of computers in education, such as efforts to achieve adult "computer literacy" and the use of computers in early childhood education. Jack A. Culbertson and Luvern L. Cunningham, eds., *Microcomputers and Education*, Part I of *Eighty-fifth Yearbook of the National Society for the Study of Education*, ed. Kenneth J. Rehage (Chicago: University of Chicago Press, 1986), discusses educational policy issues posed by microcomputers and related technology with respect to the educational program, administration, and society. Adrianne Bank and Richard C. Williams, eds., *Information Systems and School Improvement:*

Inventing the Future, Computers and Education Series, ed. Keith A. Hall (New York: Teachers College Press, 1987), contains articles by the editors and sixteen others generally optimistic about the prospect of improving elementary and secondary education with the aid of instructional information systems designed to provide timely and accurate information about student learning (reflected largely by test scores) to the classroom teacher and administrative superiors. See also Keith Ferrell, "Computers in the Classroom: Ten Years and Counting," *Compute!* 9 (September 1987): 12-28, for an up-to-date journalistic assessment of the past and future of CAI. Instructive, too, on the state of the art is "The 1988 *Classroom Computer Learning* Software Awards," *Classroom Computer Learning* 8 (February 1988): 28-38, which describes the seven new educational software titles judged best in 1988, plus 33 others considered noteworthy. These are mostly for high school and below, but among the seven winning titles is a series of seven simulation programs designed for social studies. Among the more exciting developments is Apple's new *Hypercard* software, which is reviewed in John Camp and Marc Cogan, "*Hypercard*: A Milestone in Educational Computing," *Electronic Learning* (March 1988): 46-51.

[7] Adequate supervision is essential if test security is to be maintained. To discourage student copying of disk files and printing of quizzes, a dedicated computer testing center should probably keep equipment capabilities to the minimum required. Computers with 128K RAM and a single disk drive are sufficient for student operation of Teacher's Quiz Designer, the program with which this paper is primarily concerned, and printers are unnecessary. In addition, diskettes should be housed in the same room as the computers and not allowed to be taken outside.

[8] Harcourt Brace Jovanovich claims its test preparation programs for the SAT and the ACT have been proved by independent testing at Florida State University and the University of Southern Mississippi to increase test scores. See, for example, the advertisement in *Classroom Computer Learning* 8 (February 1988): 51. Test preparation software by Harcourt Brace Jovanovich and seven other publishers is reviewed favorably and their major features charted in Caroline Ritter and Judy Salpeter, "Studying for the Big Test: Software that Helps Students Prepare for the College Entrance Exams," *Classroom Computer Learning* 8 (February 1988): 48-53.

[9] Even practice/review quizzes, if intended to induce closer reading of a textbook, are probably more effective if they are checked out to students only for use in the computer lab under supervision. Some students, desiring to improve their test scores,

have displayed a greater disposition to memorize the questions on the practice quiz than to re-read the text material to clarify misunderstood points, as intended by the instructor.

[10]This positive student response to computer-administered tests is consistent with results reported in Kim C. Moe and Marilyn F. Johnson, "Participants' Reactions to Computerized Testing," *Journal of Educational Computing Research* 4 (March 1988): 79-86. Out of 315 students from grades 8 through 12, plus a few college freshmen, who took both a printed and a computer-administered version of a standardized aptitude test, 91 percent preferred taking the test on the computer, regardless of previous computer experience.

[11]Student evaluations of History 100B and History 100D, Valdosta State College, 30 November 1987.

[12]IBM is a registered trademark of International Business Machines Corporation.

[13]IBM Personal Computer Teacher's Quiz Designer, IBM Corporation, Boca Raton, Florida. Written by John R. Marsland. IBM Part #6024075.

[14]Although some publishers now provide questions (and even a program to run them) on computer diskettes, the questions for the thirty chapters of the United States history text, John A. Garraty, *A Short History of the American Nation*, 4th ed. (New York: Harper & Row, Publishers, 1985) had to be typed into the TQD program. Questions provided on disk in some other formats, *Diploma*, for example, can be converted fairly easily to the TQD format, saving much labor. *Diploma*, a product of Brownstone Research Group, Denver, Colorado, is supplied at no charge to users of T. Walter Walbank and others, *Civilization Past & Present*, 6th ed. (Glenview, Illinois: Scott, Foresman and Company, 1987).

[15]The Teacher's Menu, a submenu of the Main Menu, also has submenus for various functions.

[16]WordPerfect Ver. 4.2, Satellite Software International, Orem, Utah.

[17]A diskette that has been formatted and had the TQD program files copied to it, in accord with TQD instructions.

[18]Notice that the long lines in this example are wrapped, but on the screen in WordPerfect they will not be. Some lines, being as much as 220 characters long, will simply run off the edge of the screen and can be viewed in their entirety by scrolling to the right with movement of the cursor. Scrolling takes place automatically as you type.

[19]Observe that long lines are clipped at the right margin approximately as they will appear on the screen in WordPerfect without scrolling to the right.

[20]Steps 10 and 11 can be omitted if the TQD disk is being used as the document disk and is already in Drive B. Just go to Step 12, and operate TQD from Drive B, if you like.

[21]This is also the appearance of a quiz being administered by the computer, except that the asterisks, indicating correct answers, are not shown. Neither are asterisks shown when a quiz being listed is locked.