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THE TICCIT-ESL PROGRAM
AT BRIGHAM YOUNG UNIVERSITY

Frank R. Otto
and
Janene Marrott

General Background Information

In cooperation with the Hazeltine Corporation, BYU has developed and refined a unique computer-assisted instruction system called TICCIT (Time-Shared Interactive Computer-Controlled Information Television). The TICCIT project uses state-of-the-art computer and television technology utilizing hardware consisting of two minicomputers and 28 color T.V. student terminals.

A limited number of experimental TICCIT-ESL segments have been used successfully to accompany regular ESL classroom instruction at BYU since September, 1976. Students and teachers are very enthusiastic about TICCIT and have asked repeatedly for courseware to be expanded and made an integral component of the ESL program. The TICCIT system has been extremely effective in the following ways: Instructional design is based on the principal of learner control accountability and provides for self-pacing; the instructional pattern is highly interactive, requiring students to participate by responding constantly to questions and usage; teachers are freed from many time-consuming, routine, and sometimes monotonous tasks, thereby allowing more time, effort, and creativity for more meaningful individualized diagnosis and instruction; course content can be readily revised to meet needs of teachers and learners. The system has a remarkably flexible authoring format.

The TICCIT course is organized somewhat like a textbook series; whereas texts are broken down into chapters, sections, and sets of exercises, TICCIT courses are broken down into units, lessons, and segments. A map identifies lessons within each unit and within each segment. Students also know exactly where they are in TICCIT course materials because of a unique system of color-coded boxes that reminds students of their progress.

Once students begin actual course work, color-coded boxes are used to lead students through a variety of learning activities on the computer. Students progress according to the following criteria. 1) A black box indicates that the student has not been working with this particular concept previously but should be prepared to proceed with the

new material presented. 2) A yellow box indicates that the student has been working on this area but has not passed all of the requirements necessary to proceed. 3) A green box indicates that the student has satisfactorily completed the area, understands the concept adequately, and is free to proceed by following the map provided. 4) A red box indicates that the student definitely needs more exposure with the concept emphasized; in fact, a red box usually indicates that the student has failed this area of expertise. 5) A blue box indicates that the material is optional. The student may or may not proceed with material in this area. Most students review material in blue boxes but they are not required to do so. 6) A white box indicates that there is an off-the-system assignment to be completed before proceeding to the next level indicated on the map.

Another feature of the system that is designed to assist students is the ADVISOR function. In order to find out how many practice problems students are expected to complete in order to pass any given segment, they are instructed to press ADVISE. The advisor will sometimes give unsolicited advice. In any case, each student is expected to work on the problems until he/she feels confident enough to move on. Students are instructed to press the ADVICE key in order to obtain feedback concerning their progress.

Function of the TICCIT Keyboard

In order to give you a feeling of how the TICCIT-ESL program appears to students, it is desirable that you have some familiarity with the TICCIT keyboard. The following descriptions will be most useful to you.

1. Center Keyboard

The center keyboard on TICCIT closely resembles a standard typewriter keyboard and is easily mastered by ESL students.

2. Right Keyboard (Learner Control Keys)

a. RULE - The rule key assesses you to a concise statement of the concept or procedure you should learn in the segment. It usually contains no examples, only an explanation or statement of the concept.

b. EXAMPLE - Each time you press EXAMPLE you will see a new problem (a sentence, word, or statement) that has already been solved. You do not answer anything on an example page. You merely read the page to see an example of the concept.

c. PRACTICE - The Practice is probably the most popular part of TICCIT because it allows you to interact with the computer. The computer will present you with one question or problem and you can type your answer. Press PRACTICE again to see the next problem.

d. HELP - There is a Help for Rule, Example, or Practice. If you are looking at the Rule and you press HELP, you will see a more detailed version of that Rule, with examples and step-by-step explanations. If you are on Practice or Example and you press HELP, you will see the answer to that particular problem as well as an explanation of how the problem relates to the Rule.

e. HARD - Pressing the HARD key while looking at the Rule will give you a technical, harder version of the Rule. Pressing the HARD key while looking at Examples or Practices will give you harder problems. Some segments do not have harder problems. The advisor will tell you if this is so.

f. EASY - The easy version of the Rule is usually a simplified version with cartoon-like pictures to help illustrate the point. When you are on Medium or Hard practice or examples problems, the EASY key will let you step back down to Easy problems.

g. OBJECTIVE - The objective gives you a statement of the task you should complete on a unit, lesson, or segment level. You automatically get the objective when you press GO on Lesson Map, but you can return to the objective anytime by pressing OBJ'TIVE.

h. MAP - Pressing the MAP key will take you to the next highest map. For example, if you were on a Rule page, you would move to the Lesson MAP. Your blue arrows would still be pointing to the segment you were in. If you were in a Lesson Map, pressing MAP would take you to a Unit MAP.

i. ADVICE - Often you will get advice without asking for it. These advisor messages are system messages that pop in whenever the system thinks you need help. But when you are in a segment, you can ask for advice by pressing the ADVICE key. You will see a score for your work on the segment. Use this page in evaluating your performance in the segment, but feel free to ignore any advice. Trust your own judgment.

j. GO - The GO key is used for several functions. On a map, pressing the GO key will move you to whatever box the blue arrows are pointing to. So be sure your arrows are in the right places before you press GO. In practice problems with more than one part, pressing GO will take you to the next part.

k. SKIP - The SKIP key is used infrequently by the student. The only time you'll need to use this key is in a test. If you have gone backwards in a test, you will use the SKIP key to return you to the item you want.

l. BACK - The BACK key can be very useful. It allows you to re-answer a question or to return to the same question after seeking Help.

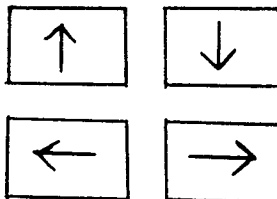
m. ATT'N - The ATTENTION is used to get the attention of the computer. When you want to log off, log on, or move to the student menu (map), you must first press ATT'N.

n. EXIT - Use EXIT to return to the course material from an advisor message.

o. REPEAT - Pressing the REPEAT key will redisplay the screen exactly as it was when you first saw it. This key is particularly useful on practice pages when you type over some original text and you've forgotten what the original looked like. Pressing REPEAT will give you back the text, delete any changes you made, and repeat any audio messages.

3. Left Keyboard (Editing Keyboard)

a.



The four keys allow you to move the cursor, the box where you type your answers, whether up, down, right, or left.

b. MARK - The MARK key is used in Practice. Whenever you are asked to mark a word or character, you must move your cursor to that word and then press MARK.

c. NOTE - The NOTE key is your communication link with the computer staff. If you see an error in a display, or if something about the text is unclear, press NOTE to write a message to us. If you need more than one line, press NOTE again after typing the first line, and you'll get a second line. Some of our best feedback from students results from this feature.

d. TAB - The TAB key moves you quickly from box to box. You use this key when you first log on to help you indicate your segment.

e. ERASE - Pressing the ERASE key will erase everything on the line following your cursor. If you want to erase only one space, use the space bar on the center keyboard.

f. INSERT - The INSERT key allows you to insert blank spaces in a line of text. After you move your cursor to the place where you want the extra space, just press INSERT. You'll see a message asking "How many spaces?" Type the number that you want (up to 9). If you want a whole line, type *. Then press ENTER.

g. ENTER - This key is the one used most on TICCIT. It serves three functions: 1) To turn pages in any part of TICCIT, just press ENTER. 2) To notify the computer that you have finished typing, press ENTER. You'll use ENTER after you answer a question, in logging on, logging off, writing a note, using INSERT, after you type a number on a map, and anywhere else when you have completed a task. 3) Often you're allowed to try again when you miss a practice problem. If the feedback says, "Try again," you may press ENTER to do so.

TICCIT/ESL and Evaluations

A test must be taken for each lesson in the TICCIT course. Each test contains problems similar to those found in the segments listed on the map. It is best to work the practice items in those segments before taking the test; however, if students are familiar with the material, they may challenge the test without doing any work in that particular lesson. If students fail the test in their first attempt, they may review the test by following the instructions on the score sheet frame. To take the test for the second time, they must complete a sufficient number of practice items correctly in order to turn the boxes green. If students fail the test in their second attempt, they must complete all segments boxed in red in order to turn them green. If students fail the test in their third attempt, they must complete all segments and turn all boxes green and the test must be administered under the supervision of a proctor. Students are instructed not to enter any answers on their third attempt without checking them first with the test proctor.

The grading system for TICCIT is based upon the concept of learning for mastery. Arbitrarily, we have established 80 percent as the level of proficiency at which we want students to perform before proceeding with additional lessons. The TICCIT system was designed to help students accomplish the following objectives: 1) To achieve mastery for each of the required lessons by passing the mastery test, prefer-

ably the first or second time. 2) To learn efficient learning strategies and self-discipline in order to complete the lessons scheduled during the semester for a particular level of instruction. 3) To remember and use what they have learned at a later time by reviewing the most important concepts regularly. (This review and re-entry pattern is provided by the course work.) 4) To become more confident and proficient with paper and pencil tests.

Authoring TICCIT

Authoring for TICCIT is relatively simple. There is no need to learn a programming language in order to generate the displays. In order to author a segment effectively on TICCIT, very specific objectives must be outlined for students to accomplish. For example, a typical objective would be to have students correctly use certain adverbs of time. To expect students to correctly use all adverbs would be an unrealistic task for one segment and would lead to a very confusing display.

The RULE for TICCIT is a very basic explanation of the concept. It should contain the theory necessary for the students to successfully complete the practice problems. The RULE may include steps in a process to be followed, the critical aspects of the concept taught, or just additional information describing grammatical functions. It is imperative to keep the explanations as concise as possible. Our experience has been that long rule statements tend to bore the students. The RULE is tailored for the student who picks things up quickly with just an explanation. The RULE HELP is for the student who doesn't grasp concepts as rapidly. It may be an expanded form of the RULE, with examples showing how the rule applies in each case, or it may include some mnemonics or other helpful background information.

The RULES and RULE HELPS are the easiest materials to prepare for entry on the computer. The authored material is formatted on grid sheets which have the appropriate number of spaces across and down to correspond to available space on the TV screen. Within this 16 x 43 space area words may be colored, underlined and illustrated in special ways with arrows, boxes and/or graphics.

The practice problems are the most complicated but most popular part of the TICCIT course work. Depending upon the type of task to be taught, practice problems may range from simple true-false questions to complex editing problems. Typical questions handled well by TICCIT are true-false, multiple-choice, fill-in-the-blank, marking key words, and word-order editing.

After determining the type of question message to be used, the practice items are written to cover adequately the point of grammar being emphasized. To assure that the student will see at least one type of practice item for every problem encountered, practice items are arranged in sets. Within each given set, the items are randomized so that students will be forced to think about answering each question related to the grammar point being studied.

The pass level for each segment is normally two sets of practice items. Hypothetically, if seven practice items equal a fair representation of the concepts in the rule, the students would be required to answer fourteen questions correctly. Taking into account that not all students will get all problems correct, at least two more sets of seven problems are written to assure that the slower students will get enough practice. Twenty-eight practice items, then, are required for this particular segment.

At this point it is relatively simple to formulate the EXAMPLE message--merely a message which points out a highlighted part of the practice item. For example, the message for one of the segments might say, "The blue word in the sentence below is an adverb of time."

The most time consuming part of the authoring process is the formulation of the EXAMPLE HELPS and PRACTICE HELPS. Often, for the sake of sanity, the PRACTICE or EXAMPLE help is to explain each of the 28 items written in terms of the RULE for this particular segment. In other words, if students are confused as to why yet is an adverb of time in a sentence they see under the example button, they can press the HELP key to explain specifically why yet works as an adverb of time here. Similarly, if students miss a practice item, they can hit the HELP key and find out why they were mistaken. Some problems require a step-by-step explanation, and other problems may only require a corrected version of the problem.

A segment written by a beginning author may take anywhere from one to three weeks, depending on the difficulty of the material to be taught and the number of graphics and special effects required. A more experienced author can complete a segment in eight to ten hours.

In summary, the exciting thing about TICCIT authoring is not necessarily that it winds up on a sophisticated computer, but that material written by those specifications actually is more instructionally sound than the material often used in the classroom. The reason for this is that the author is involved with stating his RULE in a number of clever ways, and he/she must constantly double check and revise his RULE to make certain the RULE covers all the

points necessary to properly answer the practice items. TICCIT also can administer mastery tests at the end of every lesson to insure that the students have retained and synthesized the concepts covered in the segments of that lesson.

We are pleased with the progress that we have made to date and are convinced that we are making a significant contribution in terms of scholarly research and exemplary materials development in the area of computer-assisted instruction in English as a Second Language. We encourage you to contact us if you are interested in receiving our CAI-ESL Newsletter or if we may be of further assistance in clarifying or expanding information provided in this brief article.