The TICCIT-ESL Program at Brigham Young University

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BYU ScholarsArchive Citation

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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 indi-
cates 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 stu-
dent 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 proceed-
ing 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 com-
plete 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 stan-
dard typewriter keyboard and is easily mastered by ESL stu-
dents.

2. Right Keyboard (Learner Control Keys)

        a.   RULE - The ʀule 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 exam-
ple page. You merely read the page to see an example of the
concept.

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

d. HELP - There is a Help for Rule, Example, or Prac-
tice. 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 Prac-
tice 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 illus-
trate 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 any-
time 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 seg-
ment. 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. <u>SKIP</u> - 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. <u>BACK</u> - The BACK key can be very useful. It allows
you to re-answer a question or to return to the same ques-
tion after seeking Help.

m. <u>ATT'N</u> - 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. <u>EXIT</u> - Use EXIT to return to the course material
from an advisor message.

o. <u>REPEAT</u> - 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. <u>Left</u> <u>Keyboard</u> (<u>Editing</u> <u>Keyboard</u>)

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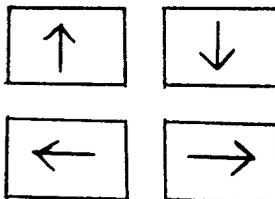
The four keys allow you to move the cursor, the box
where you type your answers, whether up, down, right, or
left.

b. <u>MARK</u> - 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. <u>NOTE</u> - 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. <u>TAB</u> - 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 every-
thing on the line following your cursor. If you want to
erase only one space, use the space bar on the center key-
board.

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 parti-
cular lesson. If students fail the test in their first
attempt, they may review the test by following the instruc-
tions on the score sheet frame. To take the test for the
second time, they must complete a sufficient number of prac-
tice 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 stu-
dents 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, preferr-

ably the first or second time. 2) To learn efficient learn-
ing 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 con-
cepts regularly. (This review and re-entry pattern is pro-
vided 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 stu-
dents 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 impera-
tive 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 exam-
ples showing how the rule applies in each case, or it may
include some mnemonics or other helpful background informa-
tion.

     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 correcty. 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.