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ABSTRACT

PLATO differs from other computer assisted instruction in that it is truly a system, employing a powerful mainframe computer and connecting its users to each other and to the people running it. The earliest PLATO materials in English were drill and practice programs, an improvement over written texts, but a small one. Unfortunately, game lessons, entertaining drill and practice lessons that take advantage of PLATO's graphics, are mostly intended for young children and have been poorly adapted for deficient college students. Tutorial lessons that attempt to simulate human interaction are much more effective, but also much more rare. An advanced tutorial program (often referred to as a "problem solving design" or dialogue system) already on PLATO indicates just how much PLATO could do. This program helps students generate and organize ideas and explains mistakes "intelligently." But since current technology cannot produce a genuinely intelligent computer, another approach using a version of Peter Elbow's heuristics and the strengths of the PLATO system requires the computer to assume a stance as a nonjudgmental medium, a neutral manipulator of information--a tool that students can use to help them learn to use language on their own. The idea of teacher as arbiter is itself probably the source of the emphasis on computer as arbiter; both should be replaced by the idea of teaching as assistance, helping the student write for a real audience, his or her peers. (JL)

PLATO AND THE ENGLISH CURRICULUM

by

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The following document is the text of an address delivered by the author at the Annual Meeting of the Hawaii Council of Teachers of English, on November 7, 1982, in Honolulu.

PLATO AND THE ENGLISH CLASSROOM

I want to talk to you today about the PLATO system as a tool for use in expository writing instruction. For those of you who are not familiar with PLATO, I will in a moment briefly present its structure, nature, and history. But my main purpose today is not just to explain what PLATO is, nor is my purpose to convince you that PLATO is necessarily the "wave of the future"; instead, I want to discuss with you some of the ways PLATO has been used by instructors of expository writing. But I don't want to leave this as a review of the past experience of others; I want to give you my sense of both the hopes and the disappointments of the system as it has been used, and my sense of how its use in the immediate future may help, but may also frustrate, the writing instructor who wants to use it with his or her students.

First, though, let's clear up some confusion about the nature of this Computer Assisted (or Computer Aided) Instruction system. The initial confusion is one that is largely engendered by the commercial vendors of the system, Control Data Corporation: to the makers of the system (CDC), PLATO is thought of as a CBE, or Computer Based Eduction system, and the difference between the computer as aid or assistant, and the computer as basis or foundation is often a major obstacle to the use of PLATO in an academic environment, suggesting to

teachers the Frankenstein nightmare of being replaced by their own teaching aids and devices, the nightmare-myth of the sorcerer's apprentice, the nightmare experience of the linotype operator's union.

Thus, what at first might seem to be a mere quibble about semantics--acronyms, at that--(CAI or CBE), actually reveals a deeper problem associated with the growth and development of computers in institutional instruction environments. If PLATO is a teaching aid, an instructional tool, then there really is a place for a human user of the tool--a teacher; but if PLATO is the teacher, if it constitutes the sum total of a student's instruction, as is implied in the vision of the CBE espoused by the prophets of technology, then one of the essential reasons for the academic environment--the community of scholars--disappears. It's a frightening and a threatening prospect in a lot of ways, and it is one of the most basic reasons that computers haven't moved very quickly into our areas of instruction: we want to protect education, scholarship, the humanities as we know them.

For our purposes PLATO must be thought of as a CAI--as a tool for us to use as teachers, a tool to help us do our jobs better, and more effectively, and more easily. What kind of tool is it? Where does it come from? How is it different from other similar tools? And what sorts of assistance does it--and can it--give us?

PLATO (the acronym is somewhat strained, though clever in its implications: it stands for "programmed logic for automated teaching operations") is first of all a computer-aided teaching system, with most of the emphasis on the word System. Unlike most other computer-teaching aids, like Apples, TRS-80s, and the VIC-Commodore, PLATO operates not as a desk-top computer, a "stand-alone" into which one can insert programs for each separate task one wants to perform with the machine, but instead PLATO works from remote terminals, which are themselves computers, that are tied by phone lines to a massive central computer, most often CDC's powerful CYBER 720 mainframe. As system, it is a more powerful and versatile tool than the other microprocessors and minicomputers available. Because it is a system, it connects all its users, so they can talk to one another through the machine, leave notes to other users, and, most importantly, get help from people running the system at the site of the mainframe. A complication arises in the notion of PLATO as one big interconnected system, when we notice that PLATO is actually run out of several independent--and all too often competing--mainframes; CDC has an array of almost a dozen independent systems around the world, all of which use materials developed mostly by themselves; so does the University of Illinois, where PLATO was originally developed; so does University of Delaware, which in some ways is the most aggressive and expansionist of the separate mainframe sites and system sponsors. And so on. Each separate PLATO system has its own "courseware" (instructional programs) which it guards jealously

as a commercial commodity--and this is understandable, since the development costs associated with acquiring such courseware are high indeed. Still, the upshot is that the economic principles of competition and free enterprise define the boundaries of PLATO's value over stand-alone CAI technology as an instructional SYSTEM: principles of pedagogy and principles of profit (or cost) seem always to come into conflict in any discussion of PLATO.

So. PLATO is a computer-aided instruction system. Does that mean that one needs to be able to talk computer jargon, to learn a computer language, or even to be interested in the technological details of the machine? The whole notion of designing it as a system, with built-in support and advice facilities, ensures a no answer: the teacher wanting to use PLATO needs only to familiarize him- or herself with the courseware available on the particular system, and in the particular field, he or she is working with (much as one always needs to familiarize oneself with a new textbook before using it in a class), and then to set up rosters of students, and decide how to assign the available courseware to the students who need it. Moreover, if PLATO is being used in a writing clinic or writing laboratory setting, with human tutors assigning CAI work to students with whom they are working, the same sort of preparation and training of the tutors is all that is needed.

I should say, however, that, although no technical training is needed by teachers or students using PLATO, the technology

seems to bring out the "groupie" in large percentages of both teachers and students, and the use of PLATO as an adjunct to a regular course in expository writing may have the ironic effect of recruiting English students (and even English teachers) into computer science programs.

Granted, then, that neither the teacher nor the student needs to have any special knowledge of computers to incorporate PLATO into a planned course of writing instruction; what sort of help will PLATO offer? When, how, and with whom should it be used?

The answer to these questions must deal first with PLATO as it is and has been, and then with PLATO as it could be.

The earliest PLATO materials in English, and even at this time, by far the great percentage of them, take the form of sort of electronic workbook exercises; much as if the lesson designers had simply taken one of the print workbooks and recorded it in "frames" on the screen. This <u>is</u> an improvement over the printed workbook in at least one respect: the student's work is scored immediately, and both the student and the teacher are automatically informed how successfully the student has worked the assigned exercise. But as expensive as all textbooks have become, they still don't come close to the enormous costs of purchasing (or leasing) and maintaining a PLATO site. Thus, the drill and practice lessons--again, which constitute the majority of English lessons available on PLATO--would not by themselves be a persuasive reason to employ PLATO in a writing class.

Other sorts of lessons have been tried--with varying degrees of success. One type is the game-lesson; it is usually simply a disguised and entertaining version of the drill-and-practice lesson. Since the PLATO screen and the computer language (TUTOR) in which the system is written are capable of generating very sophisticated graphics (certainly anything as good as is done on Arcade games), some of these games are very clever. Sadly, however, most of them are directed at language learners in the three-year-old to ten-year-old category (e.g. the "make a sentence" game in which little pictures of a dog, a tree, a house, a girl, and so on, are shown on the screen, and by arranging them in a specific order, the computer will act out the sentence constructed--no matter how silly, "the tree by the dog jumps over the house by the girl," and so on). Again, the ability of the computer to animate images and words is largely wasted on poorly thought out lessons directed at extremely young audiences. This sad miscalculation has made many of the most imaginative game and simulation lessons in English largely useless with older writing students who have deficiencies in the areas supposedly covered by these lessons: it is almost as if lesson designers assumed that anyone who has, for instance, problems constructing correct sentences, must have the mental age and personality of a three-to-ten year old child. It's downright insulting to college students.

Another approach to lesson design has sometimes been called "tutorial"--and, because it is both difficult and time-consuming to program, there are very few of these sorts of lessons.

But those few that do exist are among the most effective on PLATO. A lesson called Repairing Sentence Fragments by Brent Sweeny of Indiana University explains the differences between complete and incomplete sentences, then gives students practice working multiple choice exercises, but rather than simply settling for a right/wrong answer, the lesson responds to wrong answers with automatic reviews of the specific rules associated with the student's mistake; moreover, at all times, the student can ask the lesson for help about some aspect of the exercises, and the computer responds with appropriate explanation; hence the name, "tutorial."

The central difference between drill and practice and tutorial lessons is that the latter attempt to simulate genuine individual responses to each entry the student makes into the lesson--as if it were a human respondent, not a machine. In machine-terms, the difference is called "branching"--and it is this branching, the multiplication of possible responses the student can have to and evoke from the computer, that marks the point at which this expensive tool available to the teacher begins to earn its keep. Students respond well to these sorts of lessons-- not just in terms of positive attitudes (which even drill-and-practice lessons usually evoke), but in terms of positive, measurable improvement. In a recent College English article on CAI, William Wresch records the progress made by Richard Atkinson of Stanford through his development of tutorial lessons: English students in Palo Alto area schools using tutorial lesson materials made significant advances over students

not using such CAI materials.

Sadly, however, Atkinson isn't working on PLATO, and the work that is available on PLATO in the form of tutorial lessons is, as I have said, rare.

Summarizing, then, what is and has been on PLATO:

> the population PLATO's lesson materials have mostly been directed toward are either the very young, or the very deficient students of English; as a tool to help writing students with remedial problems, it has proven very effective, though its cost-effectiveness has been questioned;
> teachers using PLATO in conjunctinn with classes of expository writing have relied on it mainly as a sort of electronic workbook, a medium and a tool to help relieve them of some of the burden of "fixing" the stylistic error-patterns of each student; and within the limitations of the range of lesson-types available, this approach has been effective: student attitudes about issues of "correctness" of style are far more positive than are those of students forced to work merely with conventional workbooks, or forced to sit through lengthy classroom explanations of style-error-patterns.

Let me begin my consideration of what PLATO could be by noting the one exception I am aware of to the rather narrow range of pedagogic approaches taken by designers of English lessons. A series of three fairly sophisticated lessons emphasizing the process, or prewriting aspect of composition, Introduction to Essay Writing (Pat Porter, Russell Surpetis, and Melanie Wozniak of University of Illinois) make use of an advanced form of tutorial, which Wresch calls "dialogue" and which in PLATO programming circles is more often referred to as a "problem-solving" design. The first of the three lessons takes up the problem of composing an analytical essay by giving the student practice analyzing an idea--here, the idea that "writing is a

worthwhile activity." It helps the student divide up the idea in a variety of ways, and when the student attempts inappropriate divisions, the lesson explains why they are not appropriate. One of the exercises in the lesson shows how questions implicit in a topic sentence can help the writer organize his thoughts into a larger composition--a paragraph or an essay.

This lesson alone (if there are others like it on PLATO, I'm not aware of them) earns PLATO its name. For this puts the Socratic dialogue into the machine, and provides the user of the lesson an opportunity, as Atkinson says, "to construct natural-language responses, ask questions in an unrestricted mode, and in general exercise almost complete control over the sequence of learning events." That expresses the dream of the intelligent computer, and this lesson, while it doesn't fulfill all the dimensions of that dream, certainly is heading in the right direction.

Still, the dream of artificial intelligence, of the HAL of Kubrick's 2001 A Space Odyssey, and of the charming robots of Star Wars, R2D2 and C3PO, isn't here yet, and despite rough approximations of natural-language responses to human users of computerized systems, from synthesized phone messages, to the editing slate developed by Bell Laboratories which can tell a writer when his or her writing has too many weak verbs, and can suggest ways to improve those verb-choices, despite, as I say, such rough approximations of computers that really talk to us, that particular dream of the computer-designers is still

a dream, and the reality of CAI must work within the limitations of the current state of interactive computer science. Certainly, the painfully detailed design of dialogue-lessons is desirable; the educational quality of such lessons is clearly superior to other designs available--at least for the more sophisticated sorts of directed instructional segments. But in the time remaining, I would like to suggest another approach--not merely to lesson design, but to the basic assumptions about the usefulness of CAI, and particularly PLATO CAI. It is merely an outline of an approach, and not a complete working out of the implications of it, but it has the merit of working with the strengths of PLATO as a networked system of interconnected students, and in addition, it makes use of a heuristic that has gained considerable popularity among English teachers throughout the profession. I am referring to Peter Elbow's heuristics, especially his notions of freewriting and of group work that grow out of his book Writing without Teachers.

Since PLATO (and other CAI technologies currently available) lacks this ultimate ability the computer-scientists dream about--since it finally can't talk back to us freely, volubly, and intelligently, why not make a virtue of necessity, and use it for the strengths it does possess at this time? Just because the machine is so successful at relieving writing teachers of the boredom and drudgery of marking specific errors, scoring tests, and giving out basic instruction in grammar, style, and rhetoric, most users--especially those with quite a bit of experience on the system--tend to consider the machine's role

as being one of authority: the source of the RIGHT ANSWER; the SCOREKEEPER; the GRADEGIVER. Thus, one of the most common complaints seen in reviews of the many drill-and-practice lessons is that a particular lesson may fail to give the student the right answer if he or she misses and gets the wrong one. Perhaps in such sorts of lessons, this is indeed a just and pertinent criticism; but learning to write is far more--and far other--than simply learning to give the right answers to questions about stylistic choices. I would like to argue that PLATO can help (in ways not yet conceived of by its makers) the teacher of writing to stimulate his or her students to take more responsibility for their own writing, and by doing so, to take the largest possible step toward improving their powers of expression and communication.

Several years ago, while I was working in the PLATO project at the University of Colorado at Boulder, I worked for about six months on a sentence combining lesson. I'm amused to look back on it now, to see how my present argument--and its connections to Elbow's heuristics--were foreshadowed in that rather innocent attempt to escape the trap that seemed implicit in the very nature of sentence combining: an infinite number (at least theoretically) of possibilities of combination. How could a a machine be made to anticipate all the possible combinations, and to judge among them for adequacy, accuracy, and appropriateness? The task seemed absurd on its face, and so my answer was to trust the writer to become a critical audience of his own writing--that is, the lesson was predicated on the same

notions as Elbow's: that the student writer learns to improve his or her writing not by being told by an English teacher (and much less by a machine) what and what not to do, but by experiencing as directly as possible the effects of his writing on others--on a real audience. Elbow has very nicely articulated this thesis in both his works; and has worked out wonderful techniques for transferring the power and the responsibility from the teacher to the writing students.

My lesson in sentence combining, Free Exercises in Sentence Combining, took half a dozen different paragraphs--of different styles and different degrees of difficulty of their syntax--and analyzed them into groupings of their component kernel-sentences, the arrays of which were displayed for students to combine coherently and intelligibly. Thus the student assembled smaller sentences into larger ones, and then assembled those larger ones into a complete paragraph. Instead of having the machine tell him or her whether the paragraph just composed from kernel-sentences was "right" or "good," the lesson showed it set beside the two previous versions, ones which had been composed and stored by students who had earlier worked the lesson. The student was then offered a simple choice as a result of his or her comparison of the three available versions of the paragraph, he or she could either store his or her version (thereby "dumping" one of the others) or jettison it, if it wasn't as "good" as what was already stored (by whatever standards he or she might choose).

I hope you are beginning to see the possibilities of this basic

approach to CAI lesson design. It requires that the computer assume a stance as a non-judgmental medium, a neutral manipulator of information--a tool that the student can use to help him accomplish the task of learning to use his language AS HIS OWN. And of course, it requires that this stance be reflected in--or, better, that it be a reflection of--the stance that the teacher of the course takes toward his or her students.

After this too-brief sketch of just one new way of using the PLATO system in conjunction with writing instruction, I find myself in a position to conclude by reminding you of the initial confusion I spoke about in the beginning of my talk, that is, the confusion between CAI and CBE, between the computer as aid and the computer as basis or foundation of instruction.

Is it possible that there is an analogy between the way "educators" have habitually thought of the task of the computer in education--as evidenced in the vast numbers of drill and practice lessons, with their simple structure of right answers and wrong answers--and the way they (and we) tend habitually to think of our own task and role in relation to our students? How much of what we do as teachers--especially as teachers of writing--reinforces the students' vision of us as the basis of what they do, of how well they perform, of what their ultimate capacities and responsibilities as writers are? To what extent have our classroom pedagogies been designed to make our students come to trust us and rely on us as their ultimate authorities and advisors in matters of style; in other words,

to what extent have we perverted for them the notion of writing as a skill, a power, and a gift for which each writer must take individual repsonsibility?

In the concept of an Elbow-inspired approach to PLATO writing lessons, I see mirrored a vision of what is wrong and right in much of our pedagogic theory and practice: all too often we have forgotten the difference between teacher based education and teacher assisted instruction. And whatever its past and present shortcomings, my work with PLATO has taught me to trust my students to recognize and acknowledge the strengths and weaknesses in their writing, and to trust the rhetorical principle of audience-response writing, the principle that a real audience composed of a student's peers is after all the most powerful corrective to his or her writing problems; for it is that audience to which the student's writing must be directed, and of which it must claim to be representative, once the writing class is over and the student is without the class's structure or the writing teacher's authority. If we can get our computers to become versatile media by which writers can respond to audience reactions with modifications in their writing--even as we ourselves would like to do in our own classrooms, then I think we can live without the ultimately interactive computers, and HAL, and R2D2, C3PO, and their relatives can remain comfortably being what they are: science fiction.