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Teaching with Computers in America: Some Thoughts and Analysis

Personal reflection on using computers in classrooms

I have only taught university classes for a mere six years, and it seems as if I have witnessed immeasurable technology changes. I first taught in classrooms that contained little more than desks and a blackboard. Some classrooms had televisions and VCRs, but higher-ranking faculty mainly occupied such classrooms. Today, I expect to have a smart classroom—one with more than desks and a blackboard; I expect to have an opaque projector as well as a transparency projector; I expect a station with a computer that has internet capabilities and the ability to project screen images. More than that, however, I typically apply for computer classrooms, those with all of the above amenities in addition to a computer for every student.

During my second year as an instructor, I received the opportunity to teach a computer section of English Composition. Because my school didn't yet have several computer classrooms, I had to share the computer lab with other classes. My class met in a regular classroom two times a week and met in a classroom with computers one time a week. Then, I had no training in computer-based pedagogy and merely had the desire to incorporate computers into my classes. I asked the Director of Composition for some advice about how to teach in computer classrooms and he told me to just have the students work on writing and editing their essays in the computer classroom. I followed his advice and, at times, even stood in front of the class and lectured—in the computer classroom.

Today, teaching with computers is much different, partly because I have studied how to use technology in classrooms, but also because the universities I taught at have funded technology, striving for high-tech campuses. For example, my university, Bowling Green State University, provides more than mere e-mail for all students; it provides a web portal space (<http://my.bgsu/edu>) through which students can track their bursar fees, register, check course schedules, receive university notices, access classroom web space (Blackboard), take entirely online classes, etc.

Given these options, there are several ways to incorporate technology in classrooms. At the most simple level, instructors typically provide students with their e-mail addresses—if an instructor does not do so, students will typically find it on the campus e-mail registry and send e-mail to the instructor. In many cases, students can send drafts of essays to instructors and ask for advice and ask instructors questions about classes. I've found that students now are more apt to send me an e-mail and ask a question or tell me that they are ill than call me on the telephone. Likewise, I ask students for their e-mail addresses at the beginning of each semester and send my students bulk course notices, informing them of schedule changes and reminding them of due dates and exams.

In addition to e-mail, some instructors use list-serves, which the university (and websites such as Yahoo!) provides for free. List serves give the class the opportunity to asynchronously communicate via e-mail. In some cases, students can ask questions on the list serve, so the instructor should only have to answer them once, since all students will receive the reply. In other cases, a list serve can work as a discussion area, where the instructor poses questions to students and they answer via the list serve, which ideally generates a discussion in which all students can participate because online discussions lessen the stress that can be created for some students when they interact in classrooms full of questioning peers.

E-mail communication for classes, though, now seems a bit outdated. Surely, it serves as a way to keep in touch with the instructor and students, but fuller options now exist. As I stated, my university provides all students and instructors with access to Blackboard (<http://www.blackboard.com>; rivals at <http://www.webct.com> or free services such as Yahoo!groups). Of course, an instructor needs to take the initiative to use such course portals. Typically, they provide space for a homepage, space to store and access course documents such as the syllabus and major assignments, a discussion board, a synchronous chat applet, space for students to make web pages or list some personal information, etc.
At the least, instructors use such space to post copies of course syllabi and major assignments. There, students have an archive of course paperwork. In other cases, instructors use the bulletin board function for asynchronous chat space about course topics. Like list-serve discussions, these forums give otherwise silent students space to speak. The benefit of using discussion boards comes in the ability to track entire discussions by viewing them on the screen. In addition, course portals such as Blackboard and WebCT allow instructors to move discussion threads to emphasize more important areas or to separate data that might help students study for exams.
One useful component of discussion bulletin boards is that students can create their own threads, so if they want or need to discuss a topic that they feel is important, they have the ability to post their thoughts and see what their peers might have to say about it. Also, to create free discussion on bulletin boards, I often assign course units to students and they have to initiate online discussions. When students do this, I can see what they get from the course material and also might see areas that I need to give more attention to in lecture and discussion.
Instructors sometimes use synchronous chat in classrooms, as well. Some chat tools, such as those in Blackboard and WebCT, allow instructors to post data, documents, or websites in the chat applet window, which allows participants to both view and discuss subject matter—much in the same manner as sitting at a desk with an open text and having a discussion. Because many American students spend some free time talking to friends on ICQ or Instant Messenger, chat applets come as easy discussion forums for them.
Negatively, however, because conducting discussions online can encourage unbridled comments, instructors must take care to explain to students that flaming—aggressively attacking other students and their comments or using unwarranted profane language will not be tolerated. Just as some less talkative students might come alive in asynchronous or synchronous chats, some students might start attacking their peers, therefore silencing them for fear of more attacks. The best way to ward off such aggressive actions is to hold the first few online discussion sessions in a computer classroom and take time to explain to students how harmful and hurtful flaming can be.
The availability of the above tools has led universities to start offering courses wholly online. For the most part, universities are not rushing to offer online courses, instead they are finding qualified instructors who are aware of what kind of work must go into preparing online courses. In addition, most instructors explain to students that they must act responsibly to pass a wholly online course, as not checking in at least a few times a week will put students drastically behind. With the promulgation of such online courses, though, we must wonder if the brick university will exist in twenty years.

Dialogue about computer-based instruction

Computers: Composition's New Virus

> Almost no time, unfortunately, is spent in teaching educators to think critically about how and when virtual environments can support the educational objectives of teachers in English classrooms. – Cynthia Selfe

In "The Bytes are on, but Nobody's Home: Composition's Wrong Turn into the Computer Age," J. Rocky Colavito bemoans the rapid pace at which compositionists incorporate and "take for granted" technology in writing courses because these instructors take few reflectional pauses during which to assess new technological classroom practices and, thus, subsequently overlook traditional problems such as "classroom practice, teacher training, institutional awareness, and public accountability" as they uncritically adopt technology (150).

Colavito discusses his first foray as a computer-based composition instructor in 1986—in a new computer lab. Problems such as crashes, students who never used computers, lack of accessibility outside of classes, and "disk swapping" needed to share writing, added up and the semester, as deemed by the Director of Composition at his institution, failed.
Unabashedly, Colavito states that his lack of training and experience, "coupled with the institution's desire to move ahead without adequate considerations of what 'costs' the technology would incur created a negative view of the whole experiment" (151). Still, however, a larger problem underlies the situation: the ideal that if technology makes life easier or more practical, then incorporating computers in composition classrooms will make writing instruction and learning to write well easier; thus, many view computer technology as the savior that will simplify composition instruction and accelerate student learning (Selfe and Wahlstrom 57).
Still, however, incorporating computer technology in classrooms has had its successes, as when students use computers for writing, they write more, revise more, and write better as their computer experience broadens (not write better, period) (Colavito 153); however Jane Healey notes that many of the studies about the effectiveness of computer-based instruction have been largely funded by computer corporations "or educators working with such companies—the 'teacher techies'" (qtd. in Colavito 153).

Computer-Based Instruction Theories: Computer-Assisted Instruction, Computer-Mediated Instruction and Close Your Eyes

> "Of the hundreds of pounds of freshman writing books produced each year, few are constructed with any overt indication that composition theory has ever existed"
> (Welch 269)

Although most instructors refer to any computer-based classroom instruction as Computer-Assisted Instruction (or Computer-Assisted Learning [CAL]), discussing its counterpart, Computer-Mediated (or Managed) Instruction will help provide insight into current conceptions of instructional software. In "Historical Barriers to Classroom Design," Trent Ba draws a dichotomy of computer-based instruction: the difference between the two comes from the idea that one teaches students how to "write correctly" and the other shows students how to "write effectively" (8).
Robert L. Burke, however, in CAI Sourcebook, differently defines Ba's dichotomy, stating that although instructors may confuse CAI and CMI, they can interchange them; but for the sake of lucidity, he defines the popular conception of CAI as the typical drill and practice program wherein the student supplies answers to computer-paced programmatic questions. He defines the popular conception of CMI as a means to test students and record of student progress (16). CMI, then, as Alistar Inglis, Peter Ling, and Vera Joosten state in Delivering Digitally: Managing the Transition to the Knowledge Media, relies wholly on classroom lectures for knowledge exchange while CAI programs accentuate lecture—possibly by presenting new material or by presenting material in different ways (198).
Similarly, Richard E. Mayer, in Multimedia Learning, describes computer-based instruction software with two terms: automation and augmentation. Automation indicates a program that could replace instructors and teach students, while augmentation indicates programs that assist instructors. Automated computer-based instruction focuses on technology while augmented computer-based instruction focuses on students (11). Inglis, Ling, and Joosten state that technology-centered instructional software came to classrooms because, in the late 1970s, quality, highly detailed, CAI programs were costly; thus, most software developers provided minimal content that mainly tracked student progress and achievement by testing them (8). CMI programs, then, could "record performance, check student progress, and be used for record-keeping" (Hawisher, et al. 34), while CAI programs facilitate student learning by using what Richard Ennals refers to as mindtools, "generalized knowledge structures" in computer programs that help facilitate and rely on active learning (19).

Before describing CAI, though, I must discuss malconcepted CAI—or CMI. In "Using Computers to Teach and Evaluate Prewriting"[1], Philip D. Gillis describes computer-aided evaluation (CAE, a new acronym for CMI) as a means to grade essays with computer programs, noting that such programs have succeeded little in the mid 1980s (3).

Before moving on to support his evaluation software, he states that using CAI and (CAE) together may serve instructors well (4). What he does, however, is assume that an instructor could evaluate any part of the writing process, such as invention. Gillis, though, provides reasoning for his view of CAI, as he largely misidentifies process pedagogy and how it works within composition instruction, stating that focusing on the writing process instead of the finished product "suggests that a highly systematic procedure involved in the composing process may be examined and taught as a means of improving the end product itself" (4). Surely, the writing process and its recursive nature and intertwinable steps is anything but "highly systematic." In fact, Gillis finds fault with Burns and Culp's Aristotle (1980) prewriting program because it could not "evaluate the actual content the student produced" (5). Most compositionists will agree that instructors must evaluate student writing, but not at the prewriting stage. Thus, the evaluative nature of Gillis's pedagogy identifies him as a CMI proponent.

Computer-Assisted Instruction, on the other hand, was born in the 1960s out of companies such as IBM, Control Data Corporation, and Mitre Corporation; government agencies such as the National Science Foundation; and private enterprises such as the Carnegie Corporation. The companies developing CAI programs received substantial funding, as Chambers states that CAI "would 'sweep the country and ultimately change the structure of education'" (qtd. in Hawisher, et al. 34).

The many early CAI programs shared similar components: "drill and practice, or tutorials, or both—in a given content area" (36). Such perks seemed promising in reducing teacher labor, then, and in 1960, engineers and educators at the University of Illinois, Urbana, designed PLATO (Programmed Logic for Automatic Teaching Operations) to make teaching more "effective and efficient" by providing exercises and tutorials that students could work through themselves (35). During the same time, the Carnegie Corporation funded research to develop "drill and practice CAI in math and language arts for elementary school-age students" (35). Nevertheless, CAI developed into more than drill and practice programs and grammar tutorials. John Brynon and Hughie MacKay, in their introduction to Computers into Classrooms, for example, identify (rather vaguely) four branches of CAI: Instrumental--drill and practice and tutorials; revelatory--trial and error exercises; conjectural--programs that help students create knowledge new to them; and emancipatory--work that gives a tired lesson a new look (6). In "Transforming Adult Literacy Instruction Through Computer-Assisted Instruction," Eunice N. Askov and Brett Bixler differently identify the branches of CAI as: drill and practice, tutorial, learning games, simulation, problem solving, demonstration, and assessment (167).

To provide substance to such categories, in Evaluating Educational Software, Carol A. Doll states that drill and practice programs only merit use when students need to memorize course material, such as memorizing the Periodic Table and math equations for Chemistry or memorizing foreign language vocabulary (2). Further, tutorial programs should "present some new information" and then apply that information and class content in relevant practice exercises (2, emphasis added). Doll notes such usefulness for learning standardized test taking strategies or learning hot to use library services, but such programs also would work well in composition classrooms by providing students with non-graded written practice, perhaps in correlation with journals.

To explore technological development issues, Hawisher, et al. note that the importance of early CAI programs was not solely reliant on teaching but also on hardware and software design, as PLATO and TICCIT used sixty million dollars in research funds that helped develop the hardware and software (mainframes intranet terminals, plasma displays, animation, and graphics) to support the instructional software. Still, in the least, students found most of the programs sapping and more tedious than formal lectures (34-36). Furthermore, in "The Future of Teaching the Past: Computer-Assisted Instruction in History," Stanley Pycior states that although many instructors who use computer classrooms disdain

[1] After reading the title, we sense something amiss, because computers do not have the cognitive abilities to evaluate prewriting.

CAI drill and practice programs, those programs were instrumental in establishing CAI because, regardless of the educational quality of the software, instructors brought them into classrooms and used them, which opened the door for continuing software and hardware development (207).

Interestingly, Burke states that Thorndike's law of effect grounds CAI. In the law, the computer provides a stimulus which the student responds to. The computer responds to the student answer by indicating a correct or incorrect answer. If the student enjoys the exchange, they will continue actively to work with the program (22). Under such a system, then, a student may not enjoy, engage with, and learn from drill and practice because the computer then would tell students what they did wrong, offering negative responses. Students may respond more positively to programs in which they generate ungraded material, as in an invention/prewriting program.

Students disliked the new CAI programs of the 1970s and 1980s because they simply mirrored what their composition instructors gave them—there was little difference except the medium. The programmers who created the first CAI programs likely merely considered computers as instruction "delivery systems" (33). Thus, Writer's Workbench, from Bell Labs, and its focus on style-checking for superficial correctness debunks the myth of a currently sweeping process movement, as it emphasized 'product at the expense of 'process,'" according to Hawisher, et al. (31).

In addition, the first grammar and style checkers processed "text for errors in usage, spelling, and punctuation and for stylistic features such as the number of 'to be' verbs, the use of active and passive voice, [. . .] clichés, and abstract nouns, [and gave] word counts, and readability levels" (36-37). By counting and correcting student prose, these checkers don't help students write, let alone write better. Also, few students possess knowledge about how to program the grammar and style checkers imbedded in word processors so they highlight certain words such as "to be" verbs or provide detailed explanations to the corrections that they suggest.

Strickland, in "Prewriting and Computing," states that the less pedagogically useful CAI prewriting programs focused on grammar and surface-level correctness before larger concerns such as how to handle content, techniques to write, and writing to learn" (Hawisher, et al. 43). He stresses that to effectively teach students better writing skills, writing programs will first need to focus on global issues such as invention, prewriting, and organization before focusing on surface-level correctness.

Important Dates in Computer-Based Composition Instruction

Page #s indicated in Hawisher, et al., unless otherwise specified.

1967	IBM no longer packages software and hardware together, which helps give birth to the software industry (18).
1968	ARPANET (Advanced Research Projects Agency Network) begins operation—beginning of CMC (Computer-Mediated Communication) (38).
1960s-1970s	Education grants from the National Science Foundation for developing Math and the sciences spills over to English and the humanities and helps fund beginning CAI (Computer Assisted Instruction) programs (38).
1970s	IBM and Bell Labs develop Epistle and Writer's Workbench, grammar and "style-checking programs." Other CAI programs under development at various universities and institutions (18, 33).
1970	Murray Turoff further develops computer-mediated communication.
1975	"Why Johnny Can't Write"-- Newsweek
1976	Turoff created EIES (Electronic Information Exchange System), which serves as a means of asynchronous communication for teachers and students. The program later develops into IRC (Inglis, et al. 10).
1977	Established birth of computer-based writing instruction (in the composition field), when Hugh Burns created "drill-and-practice" programs (42).
1979-1982	Purported paradigm shift to process pedagogy begins. 'The work of the London Schools Project was entering the American mainstream, and 'learn to write' was being challenged by 'write to learn'" (23).

Early 1980s	Birth of the personal computer (18-19).
Mid 1980s	Computer Aided Evaluation tried in classrooms and met little success (Gillis 3).
1981	BITNET (Because It's About Time Network) forms a connection between CUNY and Yale for academic exchanges and research (38).
1981	Colorado State founds Center for Computer Assisted Writing (Smith, et al. 215).
1983	Writewell series by Deborah Holdstein 'helps writers brush up on punctuation, sentencing, word choice, etc." (Holdstein 7).
1983	Landmark special interest group meeting at CCCC: "The Fifth C: Computers." Kathy Kiefer hosts 200 teachers who try Writer's Workbench. The meeting prompts Kiefer and Cynthia Selfe to found a newsletter that later became a journal: Computers and Composition (81, 82).
1983	Brown University begins Network of Scholar's Workstations Project (funded by Apple, Apollo, and IBM) to study computing in higher education (Taylor 115-116).
1993	Mosaic, the first web browser, is released (Inglis, et al. 2).
2000	College Board offers WritePlacer Plus as one of its assessment tools (Herrington, Moran 484).

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