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Games Children Play: A Cautionary Tale

Flashy drill-and-practice computer programs may send powerful messages to students: knowledge comes in disconnected pieces, learning is boring, and computers do not extend the intellect, but soothe it.

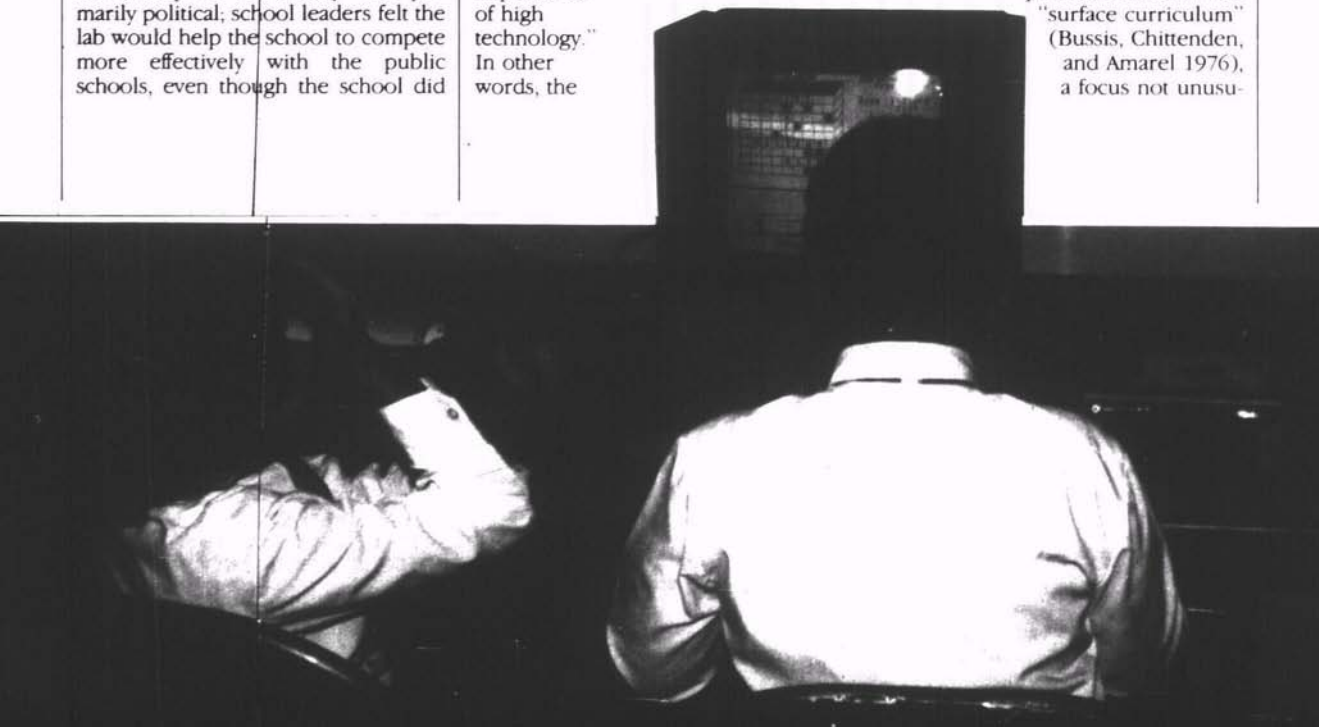
To investigate how students and teachers might realize the potential of computers, I studied two 5th grade classes in a small, church-affiliated school that was just opening a computer laboratory. The parents' organization had raised money to purchase five Commodore 64 microcomputers, and the school administrator agreed to have me observe in the lab for one day each week during the course of a semester, as well as to interview students and teachers formally and informally.

The school's decision to open the microcomputer laboratory was primarily political; school leaders felt the lab would help the school to compete more effectively with the public schools, even though the school did not have the resources to develop an exemplary program, to purchase equipment for an ideal lab, to carry out extensive curriculum planning, or to arrange for formal inservice teacher education.

In many ways, this school seemed typical. Often schools purchase computers without plans for their use or ways to integrate them with the regular curriculum or a modified curriculum. Rather, their tendency to purchase computers may reflect what Noble (1984) calls the "ubiquitous imperatives of high technology." In other words, the faith in technology is stronger than the mandate for research and analysis that should precede its use.

The scheduling of classes into the microcomputer laboratory was stablized within the first three weeks, and for the rest of the semester I observed the 5th graders working on software tutoring programs. Two classes, each with about 15 students, generally spent 45 minutes to one hour in the lab. The teachers provided an interesting contrast.

Amy, the younger teacher, in her second year of teaching, expressed concerns with "surface curriculum" (Bussis, Chittenden, and Amarel 1976), a focus not unusu-



al for new teachers. She was anxious and, having never worked with microcomputers before, initially depended on the school administrator to load programs for her. By the end of the semester she seemed more confident.

The other 5th grade teacher, Ellie, had been teaching for five years. She regularly planned projects that allowed her students to work independently. Ellie had never taught with microcomputers before, though her husband had developed some games on a Commodore 64 for their five-year-old daughter. Ellie had loaded programs for her daughter. She knew little about computers, but she felt comfortable learning with—or from—her students.

After a semester of observing and interviewing teachers, I also interviewed 21 5th graders about their thoughts and use of computers.

The Importance of Computers

Students told me that it was important for them to learn about computers, supporting their belief with, "Computers will be everywhere," or "When you grow up you might get a computer in your office and you might need to know how to use it." Sadly, however, most students did not seem to know much about *how* computers could or would be used in the future, which seems to confirm Noble's (1984) observation that most the ideas of technological preparedness promulgated in schools are not accurate.

Six students explained that computers were important because they could be useful in their present lives. Five, referring to their work at school, said, "We learn things from the computer." One boy explictly referred to a TV commercial showing little children learning from computers. Only one girl, whose older sister was studying computer programming in high school and whose family used the computer for word processing, indicated that computers could be used as tools, in this case, for word processing.

Computers as Game Machines

One could posit that most of the students did not know how computers could be used because they lacked exposure to them. However, ten of the students interviewed had computers at home, four said their families definitely planned to purchase one, and five wanted to get one. The primary use of these computers—actual for owners, anticipated for prospective owners—was to play games. Three students said they would use or did use the computer "to do homework," but when pressed they could add no details about what this meant. Only one boy with his own computer reported doing things other than playing commercial games. He had a LOGO program and Delta Draw, a LOGO-related program.

The emphasis on games continued when students talked about what they did in the computer lab. When I asked them what they had worked on, they usually referred to the "games" they had "played." Three students, asked to name their favorite programs, identified the program not by title or content, but by the display given after right answers: "The one with the boat that goes across, and the person jumps off the end."

The image of microcomputers as machines for playing games is a pervasive and powerful one. A recent newspaper article on LOGO research presented at a conference by Sylvia Weir distorted her work, describing it as reporting on the salutary effects of video games (Menosky 1984). Educational writers often tacitly accept the game format in instructional software.

> Mediocrity and mechanization certainly make themselves felt in software. . . .But an upward trend is manifest. Drill and practice, the bane of educators oriented toward more mindful activities, at least is acquiring a prettier package through video game formats and engaging graphics (Perkins 1985).

What Game Formats Teach

However exciting, stimulating, or sophisticated the graphics, I think powerful arguments can be made against relying on game formats in educational software. During the time I observed the two classes, students worked on three commercial programs, Cryptocube, Fraction Factory, and Kidwriter, and two public domain programs, a social studies program about the Pilgrims and a spelling program. Except for Kidwriter, the software programs used game-type formats. Programs asked for single-letter responses to prompts. Right answers were rewarded immediately by a score or a visual display. Units ended with a final score or a culminating display—often accompanied by music—indicating successful completion. When I began to observe students, I wondered if the game format would contribute to competition or if students would cooperate to figure out how the programs and machines worked. Hawkins and others (1982) had demonstrated earlier that children learning to program with LOGO cooperated more in pairs and groups. Turkle (1984) also documented ways social interactions changed among students learning LOGO.

As I observed the 5th grade students using game-format software, they were competing more often than cooperating with or teaching one another. The students worked on the programs in pairs, and would observe each other's scores and the scores of other groups. One condensation from my field notes suggests the dynamics.

> Amy has loaded Cryptocube for her students. Cryptocube, designed for use by two players, keeps a running record of each player's scores as she or he successfully guesses where on the grid a letter should go, or correctly places a letter in an appropriate space. As the students work they keep themselves apprised of each other's scores. Some hold their arms so that their neighbors cannot see their screens. Amy agrees that students seem to be competing with each other. Occasionally one pair will tell their neighbors an answer. Amy's students leave before they complete the game.
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> Ellie's students come in and continue to work on the games left unfinished by Amy's students. Some complain that they have inherited very lopsided scores. Ellie urges them to ignore the scores and just try to work to fill in the puzzle. They work busily. Toward the end of the period, one group notices that there is one section of the puzzle that needs only five letters to be completed. They change from the section they are working on, and try to get those five last letters before the end of class.

I first interpreted these as examples of how software design stimulates individualism and competition in school. Then one day I watched as two pairs of students, sitting next to each other, worked through Fraction Fac-

Photographs by Deborah Trumbull

The gaming qualities of the computer software provoke gaming responses from students; they shield their screens from each other while they are doing programs, and congratulate "winners." Competition, not cooperative learning and teaching one another, rules the computer lab.

tory, a drill-and-practice program with segments on various arithmetic operations with fractions. When students had finished with one set of problems in a segment, they were able to choose the segment to work on next. As each pair finished the assigned drill, they coordinated their selection of the next set of problems so that they could begin work at the same time. They then raced each other to finish.

Boredom?

As I thought about what I had seen and heard, I wondered if the events were simply enactments of competition. Often students seemed to want to score higher and beat another person to prove their own worth. Students *did* brag about how many sides of Cryptocube they had solved or how fast they had worked through a segment of Fraction Factory. But as I listened to them speak about their work, I think that much of their behavior could be described as combatting boredom and powerlessness.

The structure of the software severely limited what students were able to do. Regardless of the elaborate displays, students could only press keys to answer questions. They created no products that could symbolize the energy they had expended or testify to their originality or persistence. When the students worked in the lab, their screens all looked alike. For the most part, the only things they *could* compare were their scores, or the number of sides they filled, or the time it took them to accomplish the task. As with much "individualized instruction," the only differences among children were the number of right answers or the amount of time required.

Amy's students did not explore the software as actively as did Ellie's students, and they seemed more content to work on what was assigned. The students were usually able to work through the assigned software sections in less than one lab session and showed no inclination to practice segments again. For example, a spelling program presented students with a variable list of common words. Students could have repeated the program without encountering the same words, but had to be urged or told to do so.

These drill-and-practice programs, even when clever or flashy, did not engage students for long. The novelty of the display and the allure of a high score quickly became humdrum. The children soon tired of the clever displays and rewards. If these findings are not completely atypical, they suggest that schools that rely primarily on drill-and-practice software will require extensive libraries of programs or strong teacher control to maintain student involvement. Few school budgets would meet this need for variety.

When I asked students how they felt about the microcomputer laboratory, as might be expected from this age group, they did not articulate specific and detailed criticisms. When asked to describe their favorite programs, however, they implicitly criticized much of the software they had used.

Ellie's students did work on one software program that allowed them much more control. Kidwriter lets students create pictures on the screen by choosing from a large number of objects. Users can "place" selected objects anywhere on the screen and change their size and color. (Students can also choose an option that allows them to write a paragraph. I am not sure if the program would allow students to print out hard copies of their stories. There were no printers in the lab, so the question never arose.)

Ten of the 15 students who had worked with Kidwriter indicated that it was one of their favorite programs. They reasoned, "I like Kidwriter because you can do whatever you want, not just find the right answer like with Cryptocube." Five students stated explicitly that they found other programs boring. One girl remarked:

> The math and social studies and Cryptocube were sometimes boring. Social studies is like learning history, not like science where you learn interesting things. I like to experiment, to find out myself.

This girl spent extra time in the lab after school working with the color keys on the computer, exploring the patterns that she could create on the screen. She did not need any elaborate rewards to motivate her in this work.

Technological Thought Control

If the "medium is the message," students in classrooms [which use computers primarily to deliver drill and practice programs] might well learn that microcomputers exist to drill them while other students might learn that the machines can serve them in a variety of ways (Winkler et al. 1984).

The hypothesis made by Winkler and others was borne out by my observations. After working for a semester primarily on drill-and-practice programs, students did not have any understanding of the varied uses to which computers could be put. I found no evidence that they felt any control over the machines.

All the students said they liked the computer work, even those who found some aspects boring. One particularly honest girl said that she liked to go to the computer lab because she missed part of her regular class. Others welcomed the change in the routine, and the novelty of the machines kept students intrigued most of the semester. I wonder how long the novelty will last.

Rather than providing new, exciting means for students to explore and understand the world as Turkle (1984) describes, the microcomputer lab at this school kept students passive and controlled. There was no sense that the computers presented the children with "a microworld of serendipity" (Lockhard 1985). Most of the software programs powerfully reified knowledge: they implicitly communicated that knowledge was objective, determinate, and finite. Answers were either right or wrong; being right gained an exciting reward, but the reward was not mastery of some subject matter. These programs did not allow children to learn to use the computer as a powerful tool.

I read Turkle's book (1984) after I had interviewed the students. In one section she describes a lawyer who fanatically played videogames to "unwind" after work.

> But then he decides that "unwind" is the wrong word. "It's not so much unwind as it is that I can sort of cleanse myself in a sense, in a very strange sense."

The lawyer goes on to explain that in his work he finds out only bits and pieces about people's lives, but never sees the whole picture. Playing videogames allows him to experience a totally knowable world that he can control.

One of the boys I interviewed reminded me of this lawyer.

> I play that [game] and it gets everything off my mind. Like whatever I have that's, uh (mumble) like school, with that (game) everything clears up.

This boy liked working in the computer lab at school because "I have someone else to help me against the computer and try to beat the computer, so I like that. It's more challenging."

Both the lawyer and the boy in the computer lab used the computer as a form of escape. "Unwinding" and "getting everything off my mind" by playing computer games or by working through game-like educational software may cleanse the intellect, but it does little to teach students to use the computer as a powerful tool to advance their own learning.□

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