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# Wake Me When the Revolution is Over

by Larry Miller and Julia Blackstock

Those weren't his exact words. Jim really said, "Let me know when you get all the problems worked out of this technology stuff, and then I'll get computers in my room." A little probing beneath his flippancy revealed that Jim had been turned off computers initially for some valid reasons. Early edition computers had not been very friendly. As well, he had been skeptical about the emphasis on programming when it was popular a few years ago and now felt vindicated in his abstention as fads came and went. Jim also felt vindicated because, from what he could observe, the prophesy of a computer on each child's desk was far from materializing. He laughed that the danger of being replaced as a teacher by the computer had passed. We don't think computers should replace Jim either, but we do believe it's time for him to take another look at technology, and here are our reasons.

The difficulties are not going to go away. Five years from today some classrooms may still have only one computer, newer technology may bring greater complexity, some computer consultants may continue to purchase software without consulting classroom teachers, the price of paper will rise, many programs will remain non-congruent with our understanding of how children learn, and Jim could still be waiting for us to get it right.

In a recent paper, Burnett, Blackstock, Miller, & Warkentin (1989) described a

Grade 6 teacher and class who, at one time, created a classroom newspaper using old technology, better known as pencils and paper. Students wrote in a variety of genres and worked through each stage of the composing process to produce a published product, and the teacher, Irwin Warkentin, worked hard to foster writing through his conferencing skills. As new technology became available, his class used Apple II computers to create the newspaper. The fundamental value of the activity remained self-expression through writing; however, new technology facilitated the inclusion of graphics into the newspaper, the creation of justified columns, and faster revising and editing. Further, the appearance of the final product became more professional.

Recently, this same teacher acquired four Macintosh Plus computers, a 20 megabyte hard drive, an Appletalk network, an Imagewriter II printer, and a LaserWriter Plus printer. Combined with appropriate software, the Grade 6 class now had access to state-of-the-art desktop publishing. Using this technology, Warkentin's class produced a 300 page book that consisted of newspapers published throughout the year (Warkentin, 1987).

"Ah!" Jim might say, "I'll take Macintosh computers; they're easy to use. Maybe the revolution is complete." But if Jim believes he can jump into technology at this stage, and have his Grade 6 class produce a newspaper



similar to the one described previously, he is missing three points. First, Warkentin demonstrated a long-standing commitment to the publishing of a classroom newspaper. At a fundamental level, his main concern was to use this activity as a realistic vehicle for fostering the composing process; technology simply facilitated certain aspects of publishing the newspaper. Second, the Grade 6 class and the teacher grew with technology. The accumulated knowledge gained by using computers in the past meant that the focus centered on producing the newspaper; little time was spent solving technical problems encountered in using new hardware and software. Finally, technology continues to change. While it is true that computers seem to be becoming more user-friendly, the environment is also increasingly complex with the addition of networks and the interaction of peripherals such as laser-printers, videodiscs, midi-interfaces, and CD-ROM's. As technology continues to change, Warkentin and his students are able to take advantage of more sophisticated, powerful equipment and programs.

Is this anecdote telling Jim it is too late to use technology in his classroom? No, just the opposite. The so-called computer revolution is not going to end, so if Jim wishes to be a player the time to begin is now. He will be joining teachers who are attempting change on various fronts. In some classrooms today teachers have replaced basal readers with a rich collection of children's literature; other teachers, who in the past offered a steady diet of story starters, permit children more ownership of the writing process. In our opinion, these types of fundamental changes in teaching are similar to the inclusion of technology as an integral aspect of fostering the language arts. Jim's first leap may be difficult, but it will establish the necessary base for growth in using technology.

### **Lessons from the Past -- Instruction for the Future**

We have watched teachers at various levels of schooling struggle to incorporate technology into their classrooms as part of a three year longitudinal study (Blackstock and Miller, 1989). In the first year, efforts by

teachers to make computers a natural aspect of teaching and learning, in many ways, resembled a dance: two steps forwards, one step backwards. After two years experience, such an analogy no longer adequately captures the complex nature of professional growth. As a result of this research, we are more aware of the frustrations and uncertainty that accompanies the use of computers - factors that may frighten off teachers like Jim. But in our contact with teachers, we have also become aware of instances where computers and curriculum have been successfully integrated. In the balance of this article we wish to share three vignettes of teachers using technology in creative ways. Unlike Jim, these teachers are not sitting on the sidelines waiting for the solution to all of technology's problems before delving into its promise.

### **A Computer Museum**

At first, the visitor was impressed with the classroom that was awash with writing. "No wonder," Peter nodded with knowing satisfaction, "a Grade 4 classroom equipped with 15 computers and 7 printers." But on closer inspection, a puzzled look came over his face. The room was a computer junkyard. There were several old Texas Instrument computers, three or four Commodore Pets, a Commodore 64, a couple of 48K Apples, and even a Sinclair. "My pocket calculator has more memory than most of these machines," Peter muttered under his breath. After a brief conversation with the teacher and a final glance around the room, he continued his tour of the school.

Mary, the Grade 4 teacher, took the visit in stride and went back to a writing conference. She knew the reaction. If the room wasn't equipped with state-of-the-art technology, it could not possibly be a source of insights into the productive use of computers. But this visitor, like others, missed the point. First, her local school board did not demonstrate a deep commitment towards technology, and Mary knew that equipping her room with the latest computers would be difficult. So, she became a collector of antiques. Mary placed advertisements for old computers in her union's newsletter, the local paper, and on the bulletin board of the local



university. On weekends, she visited barn sales. Over time, she amassed an array of machines; most were purchased cheaply, but as word spread about her interests and needs, some were donated.

Beginning in September, each student in the room learned to touch-type, and because the student/computer ratio was less than two to one, ample time for practice was available. This skill, which students could use with any machine, facilitated her prime goal -- writing. Each computer came with a word processing program, and even though most were primitive by today's standards each allowed text insertion and deletion, saving of text, and printing. Some programs permitted more sophisticated functions such as block movement, centering, and 'find and change'. Mary's rotation schedule ascertained that students used each of the different word processing packages; thus, they became familiar with a range of options.

Mary would certainly love a room equipped with the latest technology, but, unlike Jim, she did not wait for the revolution to end. "I didn't even know there was a technology revolution," she told us with a twinkle in her eye. "Just look around." Becoming more serious, Mary described her view on using technology to enhance the language arts. "To me," she said, "the writing process has certain basic features, and these stay the same no matter how the kids write. Technology can enhance my teaching by making certain things, like editing, easier for the students. Sure I would like a roomful of Macs (Macintosh Computers). Who wouldn't? But that's not the point. My students will carry both their knowledge of writing and word processing forward."

### **The Real Missing Link**

There is a program available for microcomputers entitled **Missing Links** (Sunburst Communications). Using the progressive cloze procedure, students attempt to 'solve' a language puzzle based on expository writing taken from information sources such as encyclopaedias or expressive selections gleaned from quality children's literature and poetry. Judy, a Grade 5 teacher, understood the general goals of the

program, but she also was aware of one of the weaknesses of the technique used in **Missing Links**. Research indicated that students engaged in the progressive cloze procedure tended to use only local context in determining the unknown words or letters, and while not discounting the value of the program Judy realized that it could not serve as her only means of fostering important strategic reading strategies.

Judy's room was equipped with two IBM personal computers, and while they were useful, students in her class were limited in the time available for working through programs. Thus, she was faced with a situation where technology alone could not be the solution to her dilemma. Interestingly enough, the lack of technology wasn't Judy's concern at any time. "I have several useful computer programs that help my students with reading strategies," she said. "And I use them." But she was quick to point out that she relied on a variety of methods to develop such strategies as phonic, semantic, and syntactic cuing systems."

Judy was true to her word. Using Goodman and Burke's (1980) guide, she often challenged her students with a variety of strategy lessons using an overhead projector (old technology). More important, she encouraged children to use these strategies when engaged in reading. "There is a great deal of reading in my class, both oral and silent," Judy pointed out. "When students come to me about an unknown word or concept I use the opportunity to show them how to apply their strategies in real reading."

A glance around Judy's room confirmed her commitment to providing a variety of print sources. In one corner, she had a well-stocked classroom library. In the opposite corner were books related to a thematic unit on inventions while a special display contained only books written by the students. As we toured her room, one book case caught our attention. Next to the computers was a three-tiered display with the title "The Real Missing Link". Cute title, but what did it mean?

Sensing our curiosity, Judy told us the story of "The Real Missing Link". "It really was an accident," she began. "One of my students,



Mike, I think, was reading a book one day when he yelled out for other students to come over. I went to see what was so interesting. Well, it turned out that Mike, who had been reading **Charlie and the Chocolate Factory**, found one of the passages used in **Missing Links**. You see, the passages in the program come from real books." Picking up several of the books from the case, Judy continued, "The children made a game of finding the **Missing Links** passages in books so I just helped out a bit by putting them in one place. It was hard to find some of the sources, but the librarian helped me. My students even found a few I couldn't locate. So now we have almost two-thirds of the original sources for the passages. They start out to find the passage taken from **Missing Links**, but often they get hooked on the book and read the whole thing."

Is there a message for Jim in this vignette? Yes, but it has nothing to do with the end of the revolution. Technology, in this instance, was a springboard for copious amounts of reading, an important component of her literacy program at any time. Judy's long years of computer use taught her to seek or seize upon opportunities to foster the language arts whenever they appeared. It is our belief that creative uses of technology frequently have an element of serendipity to them. Perhaps the oxymoron 'planned serendipity' better captures the situation. Because Judy is a "player", an active user of technology, she is open to interesting, productive ways of using computers.

### Sanctuary

Marlene, a recent faculty of education graduate, teaches social studies courses at a high school. The focus of one unit in her course is Amnesty International, the organization concerned with the welfare of political prisoners throughout the world. Although Marlene taught the unit as part of her course for two years and was pleased with the reaction of her students, she believed something was missing. "I can't put my finger on it," she said. "It just seems so abstract, but the issue of human rights isn't abstract." Her friend, who knew Marlene's propensity to become involved in social and environmental

issues, had a glib reply. "Why don't you launch a letter-writing campaign.?" Mark needled gently. That was the start of a sometimes-great-notion.

The next year, every student in Marlene's class was asked to choose a political prisoner as a research project. The prisoner served as the starting point for the normal topics of the course -- types of government, the nature of the judicial and penal systems, and universal human rights. Only this time there was a sense of reality to the study. Students were given the option of writing letters on behalf of their prisoner although, as Marlene, in an understatement, admitted, "I think my enthusiasm for the project contributed a bit to the 100 per cent participation rate." The letter writing campaign expanded her curriculum to include such topics as determining appropriate officials to contact and the nature of persuasive writing.

Many teachers would revel in the increase in student participation. Not Marlene. Over a cup of coffee in the staff room, she once again expressed concerns to her friend. "Mark, I need more follow-up," she said. "I saw one of my former students in the hall the other day, and he asked me about the political prisoner he selected. But I didn't have anything to tell him." The problem lay in the semester system used at Marlene's high school. By the time the students selected a prisoner, carried out the necessary research, completed some of the usual assignments, and began their letter-writing campaign, the term was over. "Marlene, you need a data base," Mark said in a half serious manner. The sometimes-great-notion was about to get better.

Mark, the computer science teacher at the school, should have known that Marlene went after good ideas with the tenacity of a pit bull. After surveying his well-equipped computer room, she convinced Mark to loan her two machines and a data base software package. She also arranged for Mark to come into her class during his preparation period to teach new students how to use the data base. Mark began to think he should keep his glib comments to himself.



While the original values of Marlene's Amnesty International unit remained, the students now had a means to keep track of their political prisoners. They entered such information as why the person was arrested, the length of the prison term, how long he or she had been incarcerated, the reason for imprisonment, health status, and addresses of persons or groups to contact. Sometimes the necessary information was missing, but the data base could accommodate such problems. As the year ensued, students learned to search the data base as part of their research. One of the greatest values however was the continuity the data base afforded. Now, in addition to choosing their own political prisoner, students could follow the political prisoners selected in previous semesters and update information on any prisoner as it became available.

The data base offered other advantages. The opportunity for students to learn how to create and manipulate a data base developed a relevant technology skill in a meaningful context. The data base also permitted a continuity in the study not previously attainable. Finally, such a tool could deepen the level of analysis; students could look for patterns such as similarities among charges leveled against political prisoners.

There is a poignant story related to this otherwise positive vignette. One day, a student from the previous semester stopped into Marlene's classroom to ask if he could check on his prisoner. Marlene was thrilled and gratified by his continuing interest. Carrying on a friendly chat about how things were going in the new term, Marlene went back to some paperwork while the student searched for information on the political prisoner in the database. After a while, she noticed that she was not getting a response to her questions and observed the student staring at the computer. Going over to the screen, she saw the reason. The entry in the "Status" column for this political prisoner displayed the word "deceased".

### **Jim, It's Time to Join**

We've never liked the term "computer revolution"; it implies turmoil and radical change. Indeed, when one reads the

newspaper or technical magazines on computers, innovations in technology seem to be never ending, but how relevant is this rate of change to the real issues in education? When it comes to fostering learning in schools, how important is it to have the latest technology? The vignettes we selected to share speak not to technology but to innovative teachers who understand the learning process and have managed to forge a link between this understanding and the equipment that is available. In each instance, the needs of students were paramount, and the teachers were confident of their ability to foster interesting, productive learning. Technology simply opened up additional and sometimes unique avenues in this quest.

Jim, our residential cynic, will never find perfection in technology. We will never get it "right", and there is no perfect time to begin using technology. The innovative players are teachers who have chosen to use technology, warts and all. Their innovation comes through a sense of understanding the teaching and learning process as well as a willingness to experiment with whatever technology is available. Their cumulative knowledge in using technology smooths the way for further change, both in how they view the teaching/learning process as well as technology's role. We invite Jim to leap into the so-called revolution now...or at least stick his big toe into the fray.

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