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*In this article, the superintendent of a non-affluent suburb of Detroit describes her efforts to bring about major change in the use of technology in her school district. She focuses on three issues: preparing teachers to use the technology, educating parents that technology is vital, and assuring equity in its use. The article contains, as well, constructive criticism of current approaches of higher education to teacher training and to assessment.*

# Bringing Technology To Education:

## *A View From The Superintendent's Office*

I was Assistant Superintendent for Instruction for eight years in Royal Oak, Michigan, and am now in my first year as Superintendent of Schools in neighboring Ferndale. The school districts border each other, but are significantly different. Royal Oak is a middle class suburban school district north of Detroit with about 6,100 students. The community was generally supportive of technology, and during my tenure in Royal Oak the voters passed a \$45 million dollar bond issue which included \$6 million for technology. Ferndale is at the southern boundary of Royal Oak, but also borders the northern edge of Detroit and is far more diverse than that of Royal Oak. It includes a large non-white population, as well as a significant number of recent immigrants. In many ways Ferndale can be considered to be an inner city school district even though it is eight miles from the center of Detroit. It has about 7,800 students.

When I arrived in Ferndale in the fall of 1994, there was no computer on the superintendent's desk, and only a handful of the twenty building administrators used technology. Classroom technology was limited to a scattering of Apple IIe computers, one computer lab in the high school, one in the junior high, and less than one per classroom in the elementary schools. There were one or two Laserdisc players throughout the district, and one CD-Rom drive. There was no active television studio, as there was in Royal Oak, nor were there many teachers who had been trained in the use of educational technologies.

I made the introduction of technology a top priority because I am certain that technologies engage the students of today more effectively in learning than do the traditional approaches which we usually use. Students wait

for an opportunity to use computers and CD-Roms. Students take pride in showing their products produced with the new technologies, spend far more time working on them than when given pencil and paper assignments. This should not surprise us. They spend hours in video arcades playing video games. They enjoy the technology. They are not afraid of it, as are many teachers, administrators, and parents. We cannot miss this opportunity to engage our students in the excitement of learning.

With technology I can also make more information available, in more forms, than I can by buying more books. The world of information cannot be put on the shelves in the libraries of the schools of Ferndale. That world of information is available, however, instantly if we have the right equipment, know how to use that equipment, and have the resources to purchase the information in easily accessible form.

I therefore undertook three major tasks: 1) preparing teachers to use technology; 2) educating the parents (and others who pay the bills) that technology is a vital part of the total educational program; and 3) addressing the issue of equity.

### **Preparing Teachers To Use Technology**

As a first step in preparing teachers to use technology I followed the same strategy I had used in Royal Oak. I put a computer on my desk, the desks of each executive officer, and all building administrators. I believe it is critical for administrators to use technologies. Only then will the message be clear to other members of the administrative and teaching staff: using technology is important. If I expect my teachers to use it, I think the administrators must use it.

I began by using e-mail to announce meetings. For the first month, half of the staff and principals often missed the meetings. They did not use the e-mail. Now they all read it! I also began to provide training for the staff and principals, insisting that the latter be trained before (or at the same time as) their secretary. If the secretary is trained first, the administrator or principal never gets trained and the teachers think they do not have to be trained either. The administration must set an example.

I also use my computer to make presentations at every meeting that I hold, whether it is absolutely necessary or not. I want the entire district to know that their superintendent is serious about technology, about learning how to use it, and about them using it for instruction and in their daily work. In this way members of the Board of Education, my staff, my teachers, parents and students will see technology in use, and may want to use it as well.

In some meetings I have drawn on help from students. In one of the first meetings I held with the Board to discuss a bond issue for technology, I recruited a high school biology student who had developed a HyperCard presentation to explain how the eye works, what its parts are, and why eye problems exist. Even though the only computer available for that meeting was an old black and white Macintosh, the student captured the attention and respect of the board. They had no idea such powerful programs could be developed by a student on the older equipment in the district. The student's presentation, I believe, played a major role in helping convince the Board to authorize a vote by the public in June 1995 on a \$7,000,000 bond issue for technology. In addition, the Board requested a special allocation of \$5,000 from our local Education Foundation for the biology teacher for whom the student created the interactive report. That sent a very powerful message to other teachers, and students too!

In Royal Oak, in addition to equipping my staff and the principals, I also

had enough money to put computers in the hands of the Reading Support Teachers, a group of twelve teachers assigned to each elementary and junior high school who support instruction through training, modeling, and classroom assistance. I do not have enough money (yet) to get as many computers into the buildings in Ferndale as I did in Royal Oak, and I have only one technical support staff person to help me design a training program for teachers.

Training sessions in technology began this Spring. The technology specialist is helping teachers in introducing technology to the instructional process, and in demonstrating how technology can help in their instructional efforts. A teacher at any grade level can call for support, identifying a topic being covered in class. The specialist locates any special software, CD-Roms, Laserdiscs, or other materials that would help support that instructional effort. He demonstrates the materials, and teaches the students and teachers how to use three generic programs that can be used to create products: WordPerfect, a word processing program; HyperStudio, a program for the development of interactive presentations and applications that combine graphics, sound, animations, and text; and PowerPoint, a presentation program. These are production tools that can be used to prepare presentations and products on any subject matter. Students are expected to help each other, and to help the teacher. The teacher is not allowed to leave the classroom while the technical support specialist is in the class. I am convinced this process will get the students started using the tools quickly. I also believe they will use these tools on a regular basis, and in other classes, which in turn will encourage other teachers to join in the learning process. As the teachers learn from the students, the process will spread.

### *Ending Reimbursement for University Courses*

To generate the money that will be necessary to pay the teachers to attend the training sessions, and to hire the trainers for the teachers, I have negotiated an agreement with the teachers union to stop all reimbursement to teachers for courses taken in universities for additional credit, or toward masters degrees. Administrators and faculty in institutions of higher education should be especially interested in this decision: I am no longer paying the freight for my teachers to attend your institutions.

There are several reasons for this. First, institutions of higher education do not understand, nor do they practice experiential learning. My teachers do not need, do not want, and do not benefit from being lectured to for three hours a week. I do not want them lecturing to the students in the Ferndale School District. I want the students engaged in learning. That is one of the reasons I feel so strongly about using technology in the classroom: it engages the student. It involves the student in learning and in thinking. It allows the student to experiment, to test things out, to ask questions about why things work and why they don't. Sitting in a chair at a desk puts the students in Ferndale to sleep, puts my teachers to sleep, puts me to sleep. I want my students involved in active, experiential learning. I want my teachers to know how effective instruction is done. They are seldom exposed to those kinds of instructors in the post-secondary classes that I have been paying for in Royal Oak and in Ferndale!

Second, I cannot see a rip of a difference in how my teachers teach after attending university courses. I want them to be better teachers. That does not happen when they take college courses.

Third, the colleges and universities that my teachers most often attend do

not use technology as part of the regular instructional process. Instead, the professors lecture about what technologies are available, and tell their students to go out and use it. But use it themselves? Seldom! Demonstrate it? Many probably don't know how. My teachers tell me that they heard great lectures on the importance of interactive learning, but they never experienced it. Why should I continue to pay for that?

Finally, I needed the money and I am sure that it will have more effect if the school district itself provides the kind of training and education that I need and want for my teachers.

### *Sending Teachers to Workshops*

In addition to sponsoring in service workshops and training during the summer and vacations in the district, I am negotiating a professional development package that will include incentives to attend hands-on, production-oriented workshops and training programs in other districts, or in other places. I want my teachers in Ferndale actually to work on products using technologies that they can use over and over again in their classrooms.

### *Practice Room*

I also want to put two or three development stations into a practice room or the teachers' lounge, where teachers can work on class presentations during their preparation time. If this is done in view of other teachers, considerable sharing and learning occurs. A teacher who has been thinking about introducing technology into her classroom will see another teacher at work and will ask "Can you show me what you are doing? Will you help me learn how to do that?"

### *Create Model Classrooms*

If I expect teachers to use technology in instruction on a regular basis, they must have the tools and the instructional space in which to use them. Since funds are limited, my first effort after coming to Ferndale has been to set up four model classrooms. I was able to invest only \$3000 for technology in each room this year. More will be added later. But each room has a computer, an overhead projector that connects to the computer, a video tape player, and a monitor. All of the computers have CD-Rom players. There is also a laserdisc player and a monitor in the high school model classroom.

We are holding PTA meetings in these classrooms, and making use of the technologies that are there. By meeting in these rooms I emphasize my commitment to, and my interest in, putting technology to use in the classroom. I also demonstrate how to use the equipment. I use it myself, and encourage other participants in the meetings, especially the students, to do so. The parents are especially impressed when they see their sons and daughters using equipment they have heard about but are convinced (incorrectly) they will never learn how to use. Parents and teachers must see the technologies being used. Watching student projects which have been developed using the technological tools that are now available is an exciting and extremely powerful tool to indicate how important these technologies are, and what additional equipment would do to enhance learning.

### *Mobile Carts*

As soon as I can find sufficient funds, I will also provide mobile multimedia

production carts, an approach which proved quite successful in several elementary schools in Royal Oak. Each of these mobile production stations will have a multimedia computer with monitor, CD-Rom player, camcorder, VCR, microphone and speakers, and can be used to make every classroom a model classroom for a day or more!

In due time I want every classroom to have at least one complete technology learning station which includes a computer, a CD-Rom player, a laserdisc player, a monitor, a printer, an overhead projector, a Xap shot camera for taking digital pictures and putting them into the computer, a color scanner, a microphone for recording audio on the computer. I also want every school building to have two or three camcorders. Then I want to multiply this equipment on a steady and regular basis. Soon we will also need to have our own CD recorder so that the students in Ferndale can make their own CD-Rom products. I want software that provides information efficiently, effectively, interactively, and engagingly. I want software that can be used to produce products whatever the subject matter. These goals are within our grasp with the support of the public and the parents.

### *Finding Time*

The most difficult task I have is finding time for my teachers to learn about the new technologies. They already feel overworked. The parents want them in the classrooms even more, and do not want them taken out during regular instructional periods for training and development activities. We are exploring using summers, vacation periods, and after school hours for training. Another possibility would be to change our scheduling, with either longer class periods (which many report as critical when technology becomes used on an intensive basis in creating products) or some negotiated staff development time in non-traditional time blocks.

### *Assessment*

One of the major impediments to implementing a technology-intensive curriculum that involves and activates the learner is overcoming the traditional methods of evaluating students. An active, experiential curriculum attempts to get students to create products, to become authors. The products may be books in traditional written format, plays, presentations in front of a group, video tapes, HyperCard stacks, PowerPoint presentations, HyperStudio products, drawings, science experiments and products, and many other products as well. Traditional tests are not designed to measure the engaged learning that takes place in an active, experiential, product based curriculum. I cannot avoid some tests of the traditional type. They are mandated and cannot be altered. But I can, and do, take every opportunity to provide opportunities for parents and teachers, as well as other students, to evaluate the products that students have developed by encouraging the presentation and distribution of those products whenever and wherever I can. Performance based evaluation will be what students encounter when they enter the world of work.

We are beginning these efforts in Ferndale. But here, as in other school systems throughout the country, we need the help of higher education. We need you to model this experientially oriented, product oriented learning model. At this time you do not. You test the wrong things, develop the wrong type of evaluation instruments for our use at the elementary and secondary level, and then lobby for the use of those tests. You talk about experiential learning, but do not practice it. Where are you? You are not in our classrooms giving direct instruction and feedback to my

teachers, and you are not in our staff meetings helping us become better administrators. Maybe you are in your offices writing more journal articles which my teachers and administrative staff have no time to read, cannot understand, and which, when they do read them, have little impact. Help! Get into our settings. Model experiential learning. Use technology as a part of your regular instructional efforts, and help us learn to use them better. Develop and support new ways of evaluating students who are producers of products that call upon their abilities to gather, evaluate, sort and analyze data, to put those data into some meaningful form, to ask questions about what works and why, and to share the results of their work, in interesting and exciting formats, to other students and real audiences. I need your help, but I am not getting it!

### **Educating The Parents**

As important as preparing the teachers to use technologies is gaining support from the parents for this process. In Royal Oak I had support from most parents for the efforts in technology — although some questions were raised when I provided key staff and principals with computers rather than to concentrate on student use. In Ferndale, I have to educate parents in the importance of technology in general, and overcome a number of concerns.

#### ***Parents Say Back To The Basics***

Everyday I hear complaints from parents that their children can't read, that their children spend too much time watching television or playing at video arcades. They are upset because math, science, reading and writing scores on mandated state tests are too low. They plead with me "Just teach my kid to read," or "We need to get back to the basics." I imagine these same arguments are heard, in various forms, at all educational levels. Certainly legislatures are supporting some aspects of the Back-to-the-Basics approach, and technology funds are severely questioned and often cut.

My response is to try and expose the parents to seeing work of their children that involves reading and writing and much more. I want them to see that animations and video clips can be used effectively in supplementing text. I want them to become aware of other ways of measuring student progress than the standardized, multiple choice, true/false questions that make up so much of our testing and evaluation process. I want parents to be overwhelmed by what their children can do with technologies. When they see what can be done, the back to the basics argument is undermined. But even if we wanted to go back to the basics, we could not. The kids in school today are bored by lectures, do not want to read just text, are passionate consumers of video and audio materials, and expect their schools to use those materials in communicating with them. What I want to do is to make the students in the Ferndale School District producers of products using these new communication tools. I want them to show their parents, local businesses, legislators what can be done. I want them to be part of the world to come rather than late arrivals to a world that is disappearing.

#### ***Parents Say Expand Libraries, Buy More Books***

Libraries are another issue that has become very important. Resource materials are scarce in Ferndale. There is general agreement that we need to address this

issue. My parents say: "Buy books, add shelves to the libraries." I feel I must educate my parents to think differently. I think that instead of books we must buy more CD-Roms, Laserdiscs, access to information stored outside our buildings but accessible using technologies.

I am buying interactive CD-Rom encyclopedias, interactive compilations of *Time Magazine*, science materials, records of the NASA flights, selected video clips from CNN covering the major news stories of each year. I am buying CD-Rom dictionaries that will also pronounce the words as well as provide meanings. I am buying CD-Roms that teach reading by using graphics, sounds, and video clips in addition to text. In many cases I can get more copies of CD-Roms for less money than I would spend for books. They take up less room and do not get pages ripped out of them. Text can be printed out and taken home by a user, creating still more copies from an original at an extremely low cost. The students use the CDs more than printed material. They are accustomed to using them in their Walkmen. They like the interactivity of the medium. They enjoy listening to comments about the materials they are studying. They want to see and hear as well as read. They want to create their own original resources. CDs make that possible.

I know that for some of you this may be a difficult concept to understand. Reading about technologies is not enough. You must see it for yourself. Only then can you understand what I am saying! As an example, consider what was my own first exposure to the medium: *From Alice to Ocean*, published by Against All Odds Publications and distributed by Addison-Wesley. It is a large coffee table type book with beautiful pictures taken by Rick Smolan and text by Robyn Davidson telling the story of Robyn's walk across Australia. In the back of the book is a multimedia CD-Rom version of the book as well as a second CD filled with the beautiful photographs that are printed in the hard cover edition. When you start the multimedia CD-Rom, a map appears. Click at any point and you are with Robyn on her journey. You hear her telling you what she said in written form in the printed book, and you can bring up pictures as well as short video clips of the people and the events Robyn encountered. When she finally gets to the ocean, you can watch the camels cautiously approach this great body of water which is totally unfamiliar to them. Then you see them start to play in the water. It is an exciting event. You really feel as if you are there. If the pictures don't get you involved in reading the text, the sounds and animations certainly will. Reading will come alive once more to many non-readers. These are the kinds of books that our children will read without much urging. They watch screens much of the day anyway. They expect to see and hear, as well as read.

### ***Parents are Skeptical about New Forms of Learning***

Parents are skeptical about learning that is not like the classes where they sat and listened and followed orders. They tell stories at length of what happened to them in school, often critically, but then they turn right around and want us to teach their children with those same desk based, lecture filled, pencil and paper memory tests that they experienced in their schooling. I feel it is essential that we break this expectation.

We know that engaged learners learn more, more quickly, and more efficiently. Our goal then is to foster engagement. Engaged learners are energized by their learning; their joy of learning leads to a lifelong passion for solving problems. They know how to learn and are able to transfer knowledge to solve problems creatively. Technology plays a critical part in making highly effective, highly engaged learning possible.

### *The Equity Issue*

The third central issue which I face in addressing the technology needs of my school district is the issue of equity. Ferndale is a poor school district. We do not have the funding nor the additional economic support that affluent communities such as Royal Oak, Birmingham, Bloomfield Hills have. We do not have computers in many homes. Fewer parents in Ferndale regularly use sophisticated technologies in their work than is the case in Royal Oak. When I came to Ferndale, there was very little technology in place, and being used in the schools, and what was here was old.

We know, however, from what we see as well as what we read and hear, that the world of work is fast becoming a world in which mastery of technology is absolutely essential for success. I want my students to be fluent in technology when they graduate from Ferndale, as well as fluent in communicating through the written and the spoken word. I want them to be able to learn on the job, and not think that learning comes only from books and from sitting in a classroom. I want them to understand that they will be evaluated in the world of work by what they can do and by what they create and produce, not by what they can remember for a standardized test. It is the goal of the Ferndale schools that all Ferndale students will become quality workers who use cooperation, consensus, and creative decision-making; complex thinkers who apply information, analyze, synthesize and solve problems; effective communicators who effectively listen and present oral and written information; self-directed learners who can access information, evaluate and create new ideas; community contributors who value differences and positively offer themselves to others.

Technology is critical in helping me address the equity issue. Ferndale students must learn to use technology. I want them to have an equal chance at sharing in the rewards and benefits of society. They will not get them if we continue to address the educational issues that we face as school administrators, teachers, parents, and students using out of date, inefficient, inappropriate technologies. It seems clear to me that reform is not only desirable, it is critical to our survival and to the economic survival and success of our students! If I cannot supply access to and experience in using the technologies critical for success in a world of world that is technological to its core, where will my students acquire these experiences and these skills?

### Summary

My approach may not work for you. Your school district, college or university may be very different, starting from a different place, funded in a different way. I suspect, however, that whatever our differences, there may still be some things which I am doing that may be helpful. Here is a check list of my approach to bringing technology to education.

- Be involved yourself. Learn and use the technologies. Explore the new ways of gathering information. Show by example what you want done. If you are not a user of the new technologies, you should be! The best teachers are learners themselves.

- If you have not used *From Alice To Ocean*, or some other CD-Rom, do so immediately. It is not magic. It must be read by all students and teachers!

- Insist that your administrative staff be trained and use technologies. Don't let them train their secretaries and avoid setting a good example themselves.

- Train your teachers, your faculty, your staff. Find time for them to learn. Assign support staff to assist them in their classrooms. Provide model classrooms

and portable equipment for them to use. Encourage them to learn from each other by creating demonstration sites, or production stations where they can interact with other teachers working on class preparations. Provide them workshops that model the behavior you want them to exhibit, where technology is used, a project is developed and shared, learning is active and engaged. Encourage teachers to learn from the students (I have not found that to be a problem). But provide separate training for administrators who are very reluctant to let those who report to them find out how little they know. Provide for professional attendance at appropriate training sessions. Encourage visits to schools, colleges and universities that are successfully integrating the use of technologies into their curricula.

- Educate your parents or those who pay the bills. Maybe your bill payers are the students, or legislators, or the public at large. Whoever they are, take advantage of every opportunity to use technology in their presence. Provide ample opportunities for them to see student products. Engage them in discussing the efficiency of making information available through technology rather than by means of traditional library-based materials. Show them that industry is already doing this, quite successfully and at less expense.

- Address the equity issue. Make sure that all your students have a chance to be successful in a technological world. If you are not providing them access to the technological skills and experiences they will need to be successful in the world of work, are you really fulfilling your responsibilities as an administrator and an educator?

- Raise money. Create new sources of income to support technology efforts. Reallocate where possible. Remember that we are talking about permanent additions to the budget. We are not going to be successful with one shot investments!

- Develop a plan, a wish list. Know what you want and why. Communicate those goals to others.

- Enlist help from others. Here I appeal to those of you in higher education who may be reading this essay. We need some special help from you. Learn about and use experiential learning, don't just talk about it. Use technologies in your instruction, don't just tell us that we should. Help us discover better and more efficient ways of using technology in our classrooms. If I weren't trying to be polite, and get you to help us, I would suggest that you close all of your classrooms where you try to teach educational administration and leadership. The universities should provide cars and car phones instead and you should come work with us in our classrooms and administrative meetings. See what is happening first hand. Do not attempt to address our problems long distance. We also need your help in addressing the issues of evaluation and testing. Help us find ways to evaluate active, experiential, project based curricula. Help move us away from pencil and paper multiple choice, true false testing. Write interactive CDs filled with sounds, pictures and video clips like *From Alice To Ocean*, not more journal articles.

- Finally (or once again), be involved. Share your excitement. Rumor has it that learning something new can be fun!

Good luck!

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