Preface

Schools have been part of the American scene since the beginning of the American scene. They did not have the look and feel of a 21st century school, often geared more toward religious instruction than the study of literature and mathematics. Often in the 19th century Western towns, the school was a room in someone's house or a one-room school house. Perhaps this also was the case more often than not, but that is not what this book is about. The point in mentioning that schools are not new to America is that schooling has a long tradition, not necessarily for all who lived in America, but a long tradition nonetheless.

Teaching also has a long tradition; it always has been a time honored profession. While the mission may have grown into enculturation of immigrants into the "American way," whatever that means, students have learned to read, write, do arithmetic, and think about important ideas on the way to becoming adults and productive members of society.

Teaching, for many decades, consisted of the teacher telling the students what they needed to know and students "learning" what had been established by someone as the curriculum, or what they "needed to know." Students were empty vessels waiting to be filled with facts and information that they were then to turn into knowledge by way of assignments and examinations. Whether that transformation occurred was a mystery to many, but the "plan" was for it to happen.

In addition, technology is not new to schools, but has had a history of both success and failures. Cuban (1986) documented clearly that each time technology or machines were introduced into classrooms, with the notion that they were going to revolutionize education, nothing changed. The fact was that the film projectors had to be scheduled in advance, not used serendipitously, thus making them appear to be unavailable and difficult to use. And how many of the readers who lived through schooling in the 1950s remember the film breaking at the splice in the middle of the

film, and thus ending that part of the lesson? There were problems for sure. Teachers were not technicians, and not all schools had an educational technologist who could fix what ever problems arose, whether the bulb burned out in the overhead projector or the film broke. Thus, teachers began to think of technology as more of a nuisance than a boon.

Then computers came into classrooms. Here again Cuban (1986, 2001) and Schofield (1995) chronicled that under use, or lack of use, of computers in classrooms was predictable and due to inertia and resistance by teachers. This was true of some teachers, especially in the late 1980s and early 1990s when computers were still unique in classrooms and not prevalent in homes, especially not in teachers' homes. But it is not fair to blame the teachers for lack of use of computers. For many reasons, the computer is one pedagogical option for teachers, *not* the only option.

Teachers are not known as risk takers. Teachers often teach the way they were taught, which is apt to be the way they like to learn. They are in charge in their classrooms, not the students. That is a very important fact to remember. Changing the dynamics or social structure in the classroom such that the teacher may no longer be the most important person in the room is tantamount to heresy! And yet for computers, in particular, to be effective in supporting student learning in classrooms, where the ratio of students to computers is likely to be 30 to 1 at worst and 4 to 1 at best, the teacher must be comfortable with ceding some control to students, which they may think will lead to chaos. Allowing different activities to happen at the same time with not all students listening to the teacher is not the paradigm with which most teachers grew up, nor do most administrators understand. I will always remember a colleague relating a story about his department chair coming to review his teaching in one of his classes. The students were in groups working on different projects and my colleague was moving between the groups assisting and keeping them on track. The department chair, uncomfortable with the apparent noise and activity, told my colleague that he would come back another time when he was really "teaching.." And, he was not using computers, but active learning in cooperative working groups! So the vision of what is appropriate in classrooms makes a big difference on what happens there.

Schofield (1995) describes a school from the mid-1980s and how technology was used little if at all. She notes that there was training available for teachers at a "Teachers' Center" (p. 117) on many topics, including computers. Unfortunately, this training was away from the classroom and divorced from the reality of the teacher's students and teaching needs. Such training, unless reinforced back in the school, routinely fails to make a difference in classroom teaching practices. In addition, such training is only about the hardware and possibly specific software that may or may not be available in the classroom, thus transfer of skills may be difficult at best. And for those teachers who are concerned about maintaining the aura of authority in the classroom, showing a lack of knowledge or lack of expertise would be difficult to handle. One thing that is not taught in colleges of education is how to say, "I don't know, but let's find out together."

Computers have continued to develop and become more powerful tools than was ever dreamed of when they came into schools in the late 1970s. And because they continue to change, the problem of keeping up with the new software, operating systems, and tools can be awkward and intimidating. It is much easier to say, as one of the teachers quoted in Schofield's 1995 book, *Computers and Classroom Culture*, put it, "It [the computer] didn't do anything I couldn't do easier and cheaper on the blackboard." (p. 103) This is the ostrich approach to change—stick with what you know, stick your head in the sand, and perhaps _____ (insert the innovation du jour) will just go away and I can keep doing what I've been doing.

Well, it is true that technology, including computers, often arrives in classrooms not at the request of the teacher. It continues to be true that most of the formal and professional development training teachers receive about computers and teaching occurs outside the classroom. And it is true that there are many computers in many classrooms that are not used, or considered to be underused by critics of technology use. These facts do not negate the considerable impact computers and other technologies have on schools in spite of barriers and inertia by many.

About this Book

This book is about one staff development program designed to help teachers change their teaching practices through a professional development program developed initially in the Philadelphia school district in conjunction with the IBM® Corporation, called Continuous Practice Improvement (CPI). The purpose of this book is for readers to identify with one or more of the teachers whose stories are chronicled here and to understand that using computers in teaching and learning is not about technology, but about good teaching and classroom management. These were brave teachers at various stages of their careers who wanted to be 21st century teachers, recognizing that computers were not going away, and they needed to help their students be 21st century citizens.

What made this program unique was not that teachers were given technology for their classrooms, but that the program adopted the medical training model of "resident" teachers, like resident doctors, who worked with other teachers in their own environment to "show" these teachers how they practice teaching that includes technology/computers as just part of the process. These resident teachers provided guided experiences for the novice-technology-using teacher in practical ways that allowed the novice-technology-using teacher to envision how this would work in their own classroom. Then they went back to their classroom and made the changes, tried out the new methods, revised the processes in collaboration with the Resident Teacher and other novice-technology-using teachers participating in the process in other classrooms, thereby changing their approach to teaching.

The Continuous Practice Improvement program, or CPI, was not about learning how to use a computer or specific software. Yes, the novice-technology-using teacher needed to become comfortable with computing and computers, but that was not the main point. It was not about using computers to teach reading or mathematics or social studies or science or anything in any particular classroom. CPI was about good teaching in general, classroom management practices that allow for different activities occurring in a classroom at the same time without chaos taking the reins. Computers were just part of the process.

One example of the success of the CPI program is a fourth grade teacher, who you will meet in Chapter IX, from an inner city school that is located in a disadvantaged area of the city. When she came the first day of training she was absolutely convinced that she could not use a computer and in fact she was going to break it. She came with others from her school who had encouraged her to participate so she could get a new computer for her classroom, but that was the only reason she was there. When she received her loaner-laptop, she could not get it to turn on, therefore she had broken it. Then she could not open the Web browsing software, so she had broken it. One of her colleagues tried to help her, but she was convinced she was not going to be successful. The next session she was a bit more comfortable with the computer and was beginning to learn the software. When I visited her classroom six months later, she had two computers in her classroom in a center for her students to use for research projects. The students were using specific Web portal options that she set up for them to do research on different states. Each child was assigned a state on which to research and write a short paper. They, the students, then were going to create a joint project so they would learn from each other, not from the teacher. She was comfortable being the guide, the overseer of the projects, but not needing to be the direct deliverer of information. Not only was she now sure she could not break the computer, but she was sure her students were learning valuable lessons because they had access to the computer and information found on the Internet. Could they have done the projects without the computer? In this case no, because the classroom and school did not have enough resources. So the computer brought something to her classroom that she could not have achieved before, and would never have imagined doing before the CPI experiences. And the students were excited about what they were doing, learning, and creating. Is that not what teaching should accomplish?

But that is just one example. This book is about the stories of these teachers and how this program changed their practices. Not all the stories are equal in length or weight. Some teachers changed more than others, but that is not the essential message. In this book, as previously noted, the author hopes that one of the stories will resonate with a reader who, like the fourth grade teacher above, believes computers are just too complicated and not necessary. They can not use computers in their classroom because it would be too disruptive. But then they will read about another teacher who teaches the same grade or perhaps one above or below the grade they teach, and read how that teacher changed their practices through CPI, and they will

see that it might work for them. The problem will be that they do not have a CPI program in their school district. But nothing will be stopping them from working with others to set up such a program. It can be done.

How does this book contribute to knowledge about teachers and professional development? The Continuous Practice Improvement program was studied by myself and my research assistants for three years and was also studied by the researchers from the Center for Children and Technology of the Educational Development Center. While it has a successful track record overall, this history and process of the program has remained hidden from the public at large. The program that initially supported CPI was the Reinventing Education (RE) program of IBM, which was in its 11th year of existence in 2006 and had grown to a $75 million investment by IBM in 21 U.S. cities and 10 countries outside the U.S. Unfortunately, CPI was expensive and thus discontinued in Philadelphia, even though it was a successful program.

One contribution this book makes is in creating an amalgamated professional development model or lens for how districts and schools can determine and assess whether technology oriented professional development efforts can and will establish sustained change in classroom practices. The combination of a strong and useful training program with time to practice, effective and ongoing post-training technical and social support, and changes in classroom structures and values leads to sustained classroom changes in practice. This model uses all the lenses used in analysis of the teachers' stories to present a composite lens that district leaders, principals and teachers can use to guide professional development efforts.

Setting the Stage: The Philadelphia School District

In 2004, the School District of Philadelphia was the seventh largest in the nation based on enrollment, serving a racially and ethnically diverse student population. As of April 2004, the enrollment totaled 196,309 students, including early childhood programs like Head Start and preschool. Over 65 percent of the student population was classified as African-American, with over 14 percent Hispanic, over five percent Asian, over 14 percent White, and a small percent Native American.

There were 273 schools as of April 2004, including 175 elementary schools, which range in grades from Kindergarten through fourth grade to Kindergarten through eighth grade (and includes one school that was a Kindergarten through 12th grade school), and 43 middle schools in 2004. The district began to phase out most middle schools starting in fall 2005, meaning the configuration of many elementary schools changed to include middle grades or middle schools became fully functioning elementary schools. Thus, the number of elementary and middle schools as recorded in April 2004 was not the case in fall 2006, and this data was not available since the landscape was still changing. There were 43 neighborhood and magnet high schools, and five vocational-technical schools. As with changes in elementary and

middle schools, the district administration was moving to reduce the size of many high schools by dividing them into smaller high schools and creating specialty high schools, such as the new high tech high school created in partnership with Microsoft Corporation that opened in fall 2006.

The district was organized into nine regions in April 2004, with the Center City region added in fall 2005. The Center City of Philadelphia experienced a surge in population over five years prompting the district to recognize the importance of highlighting and supporting the schools that served the Center City area, an attempt to retain the children of the Center City residents in public schools.

In order to maintain the dignity and anonymity of the teachers who volunteered to be interviewed for this book, their names have been changed to pseudonyms to mask their identities. In the end, after five years of offering the program under the direction of Ms. Maguire, 294 teachers (29 males, or 9 percent, and 265 females, or 91 percent) from 63 schools completed the program. The names of the schools where they taught are not given, but identified by the area of the city in which they exist along with some basic demographic information. The number of students in the schools will be presented as either "low" level of enrollments (between 300 and 500 students), "middle" level of enrollments (between 600 and 800 students), or "high" level of enrollments (between 900 and 1200 students), again to mask individual schools that stand out because of enrollments. In addition, the level of student attendance and mobility will be presented. District-wide attendance by students was expected to be at the 93 percent level, which is reached by most schools; however, we acknowledge that many children have competing pressures causing them to miss school for reasons other than illness. The same can be said about mobility of students across the district. One teacher described the student population in Philadelphia as "migratory," in that there are some students who move frequently from school to school. The reasons for this migratory behavior is vast and speculative, and not the point of this book; however, this statistic will be presented to help readers identify with the schools.

The Research Process for This Book

Working with the CPI program Director, teachers who participated in the CPI program in either the original design or revised design for implementation across the district and who were still teaching in the same schools as when they participated in the program were identified. They were contacted initially by e-mail or in person to gain permission to interview them for the book. Once permission was obtained, they were interviewed either over the phone or in their classrooms at a time convenient for them. The four basic questions asked were the following:

1. In what context were you teaching when you participated in the CPI program?
2. What were your personal conditions (feelings, hopes, needs, moral dispositions) that brought you to want to infuse technology into teaching?
3. What factors outside yourself (policies, school, teaching, other teachers) influenced your decision?
4. Considering over time, what has changed in your teaching practices since CPI?

The researcher took copious notes about the conversations and transcribed them within 24 hours of the interview. The transcript was e-mailed to the teacher for clarification and verification that the information was presented accurately and represented their thoughts properly. Teachers were given the opportunity to approve the transcription or edit it for clarity. Interview transcripts were grouped by grade level and theories of change in schools (see Chapter II) were used to analyze how the CPI program changed their practices. The following presents to the reader the contents of this book.

In the end, over 70 classroom teachers who participated in the CPI program were interviewed. This book presents 57 of these teachers who reported experiences that were different from each other. Of these 57 teachers, five were male (9 percent) and 52 were female (91 percent), which is equivalent to the population that participated in the CPI program overall. While there were attempts to interview many more CPI teachers, the ones presented in this book were randomly selected based on their availability and willingness to be interviewed, which may present a slight bias toward those teachers who were willing to talk about their CPI experiences. However, as the reader will find, these teachers were from different parts of Philadelphia, from different types of schools, but were willing to embrace change in their classrooms for the 21st century—the first step toward changing practice.

Teachers and Technology: Continuous Practice Improvement of Classroom Teaching and Learning

Section I: Promises, Promises: Microcomputers in Classrooms

Chapter I tells a very brief history of computing starting with Charles Babbage's Difference Machine. This is a brief history because the long history is available from many sources. Computers came into being to solve computing problems. With each generation of computers, the computers have gotten smaller, faster, and more efficient. The arrival of the Internet and subsequent World Wide Web revolutionized how we communicate around the world and have access to information. Overall,

computers have changed the way people think about the size of the world, as exemplified by Thomas Friedman's book, *The World is Flat* (2005).

This chapter continues with a brief history of computing in schools, including the initial movement with computer-assisted instruction using mainframe options through universities. Again, this is a brief history because the complete history is available through many resources. Computers were initially used to mimic programmed instruction and task analysis from the 1950s and arose from the work of B.F. Skinner, among others. There were many different instructional systems created to support teaching, not the least of which was LOGO. LOGO appears to have had a major influence on some teachers' acceptance of computers into schools. How computers have impacted classrooms is discussed, which has not always been positive, but the research methods used have been inconsistent as well. Overall, teaching with computers has changed from teaching to program the computer to how the computer can facilitate learning in general.

Lastly, Chapter I presents a brief history of computing in Philadelphia schools. The Philadelphia story seems to have never been told. But this history sets the background for the CPI program. While the overall story of how computers infiltrated schools in Philadelphia is not unlike that of other large, urban cities, there were interesting components to this process. LOGO was a major force for those early adopters of computers in their classrooms. Now every school is wired for fast access to the Internet. In 2003, the district instituted an Internet-based instructional management system to support teaching and learning, giving each teacher from Kindergarten through eighth grade a laptop. Smartboard technology is coming into schools. Changes continue to occur with regard to computers in Philadelphia schools.

Chapter II presents theories of change in classroom practice, the ever present challenge to teachers and schools. Six approaches for evaluating how change occurs are presented, including Rogers theory of diffusion of innovations (1962, 1972, 1983, 1995, 2003), work by Fullan and Pomfret (1977) on determinants of implementation of innovations in schools, work by Berman and McLaughlin (1978) as part of the Rand Corporation study of federal change agent grants, the Concerns Based Adoption Model (CBAM) by Hord, Rutherford, Huling-Austin, and Hall (1987), and Fullan's three interactive factors that affect implementation of educational change (2001). These frames of reference will be used to assess the level of change in practice found in studying the teachers interviewed for this book.

Chapter III presents a brief history of professional development for teachers over the last thirty years, then moves to professional development for teachers to use computers. Given that professional development is all about effecting change in teacher practices, the discussion of how change happens from Chapter II is important to this discussion. This chapter is a brief history of professional development of teachers because there are legions of books, magazines, and journals dedicated to this topic. Here will be presented some of the issues that have been discussed

over time, including whether or not professional development of teachers makes a difference.

Chapter IV relates the development of the CPI program through the IBM Reinventing Education project. Specifically, the chapter discusses how the teachers from the initial three schools worked with staff from IBM to develop and plan the CPI model of professional development, and then how this model was expanded district-wide. The program itself is described, including what was taught in the three Saturday training sessions, as well as what was intended to happen in the visitations with the resident teachers. One component that is important to the chapter is the director of the CPI program, Ms. Maguire. She was dedicated to the model, and still is. She was the driving force that made this model work for these teachers. This model was not about computing, *per se*, but about good teaching and classroom management. The key is having someone who champions the model and makes it work.

Section II: Teachers Voices: Early Childhood Teachers (K-2 Grades)

Chapter V presents seven Kindergarten teachers interviewed for this book. While not all the Kindergarten teachers who participate in CPI were interviewed, I firmly believe these are representative of how others' classroom practices changed. Chapter VI presents six first grade teachers interviewed for this book, and Chapter VII presents six second grade teachers. For each grade level, the impact of change theory and professional development will be discussed.

Section III: Teachers Voices: Elementary Grade Teachers (3-5 Grades)

Chapter VIII presents six third grade teachers interviewed for this book, while Chapter IX presents six fourth grade teachers and Chapter X presents seven fifth grade teachers interviewed for this book. As noted with Section II, this is a representative sample of the third, fourth, and fifth grade teachers who participated in the CPI professional development program. The impact of change theory and professional development on their practices will be discussed.

Section IV: Teachers Voices: Middle Grade Teachers (6-8 Grades)

Chapter XI presents six sixth grade teachers, while Chapter XII presents six seventh grade teachers and Chapter XIII presents seven eighth grade teachers. It is of interest to note that as the teachers were in higher grades, less change in classroom practices occurred and there were three instances of teachers with either no overt change in classroom practice or change in only personal use of computers.

Section V: Conclusion and Professional Development Model

Lastly, **Chapter XIV** presents an analysis of the level of change that appeared to have occurred in these teachers classrooms, as self disclosed. Change does not come easily or in a vacuum. In addition to the six lenses related to change presented in Chapter II, the Apple Classrooms of Tomorrow stages of technology adoption are used to analyze how these teachers grew from non-users of computers toward infusing computing into their classroom practices for teaching and learning. Thus, seven different, but related, lenses are used to analyze the level of change that occurred for these teachers. From this research and analysis, a theoretical lens is presented to inform teacher professional development to effect meaningful change in classroom practice as related to changes in uses of computers in classrooms.

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