Preface

Today's educational environment is a complex interplay of goals, needs, competing requirements and pressures, and dwindling resources. School leaders have responsibility for creating an educational environment that improves student outcomes and supports opportunities for all. This book is designed to provide leader-tested strategies, exemplars, and practical advice about specific ways that technology can be leveraged to support the journey of successfully leading 21st century schools.

Each of us might have a conception of what a 21st century education might look like, and many have described that ideal. Overall, such an education would include a focus on content that is integrated and interdisciplinary, take advantage of the affordances of technologies and multimedia, offer global perspectives, be more student centered, and promote the skills of collaboration and problem solving through project-based relevant, authentic, and real-world challenges. In order to reach this goal, schools must also promote life-long learning as they create environments that support these goals. A 21st century education also promotes the expansion of the definition of literacy beyond the reading, writing, and arithmetic that may have guided what we learned in school. Literacy now includes topics such as finances, media, social/emotional development, physical fitness/health, ecology, and creativity.

The purpose of this book was to learn from teachers and administrators in award-winning schools and districts about the role that technology, and myriad other factors, plays in school improvement and school reform initiatives as we strive to create such schools and prepare students for their future. Themes, examples, and other information in this book come primarily from eight schools and districts we studied as part of our research on award-winning, exemplary schools. These are places that showcase leadership for the 21st century and provide examples of how a 21st century school looks, plans, uses data, and supports its teachers to improve student outcomes. We collected our information in a year-long adventure in which we identified, visited, and investigated these eight schools

through in-depth observations, interviews and focus groups, and document analysis to help us identify strategies and systemic efforts that have led to their success as award-winning schools.

WHY THIS BOOK?

In a previous book (Schrum & Levin, 2009), we examined the ways in which technology was being used to enhance engagement and learning in a general way; we had many requests to provide more specifics, details, and ideas from school leaders who were successful in making changes in their districts or schools. This book is an important addition to the literature and is useful to school and district leaders for the following reasons:

1. We provide experiences, examples, and ideas from schools throughout the country, with authentic challenges similar to those faced by most other schools.

2. We present a variety of approaches to leveraging technology, creating infrastructure, and implementing changes in teaching and learning when school improvement is the ultimate goal.

3. We let teachers, leaders, and others speak for themselves; hearing their voices as they explain their problem-solving approaches offers a unique opportunity to identify what is useful or adaptable in your own circumstances.

ORIGINS OF THE BOOK

Our goal was to determine successful strategies used by these award-winning schools and districts, and to learn how their leaders leveraged technology in curricular, administrative, and analytical ways to meet the needs of 21st century learners, educators, and communities. By studying award-winning schools from across the United States, we hoped to share proven strategies and successful models that can be adapted by other schools/districts based on what has worked for transforming these schools into award winners. The primary research question for this study was: How are award-winning schools/districts using technology to improve their schools?

Research tells us that technology leadership matters for promoting the successful integration of technology in schools (Anderson & Dexter, 2005), and that administrators need to be increasingly involved in the technology projects in their schools to model and support its use (Stuart, Mills, & Remus, 2009; Williams, 2008). For example, Somekh (2008) found, "Teachers are not 'free agents' and their use of ICT for teaching and learning depends on the interlocking cultural, social, and organizational contexts in which

they live and work" (p. 450). Ertmer and Ottenbreit-Leftwich (2010) suggest that teachers require broad support in terms of knowledge of technology, ongoing pedagogical knowledge, and input in decisions regarding appropriate technology to support student learning.

Research about successful technology integration tells us that many factors influence the actual impact that technology has on teachers and students in today's schools (Ertmer & Ottenbreit-Leftwich, 2010). Among these factors are the technological, pedagogical, and content knowledge of teachers (Angeli & Valanides, 2009), teachers' sense of self-efficacy, and their beliefs about the value of technology for making a difference for students (Ertmer & Ottenbreit-Leftwich, 2010; Windschitl & Sahl, 2002). And, as Ertmer and Ottenbreit-Leftwich (2010) wrote, "Although beliefs can influence knowledge acquisition and use of technology, context also plays a role in teachers' uses of technology. Teacher beliefs have been shown to be heavily influenced by the subject and school culture in which they participate" (p. 264). In fact, contextual factors in schools are influenced by and in turn can influence teachers' attempts to integrate technology (Windschitl & Sahl, 2002; Zhao & Frank, 2003).

THEORETICAL LENS

Recognizing the important role of school and district leaders in initiating reforms, we used theoretical notions about distributed leadership to guide our analysis of the ways the people in schools we studied operate. Distributed leadership assumes "a set of direction-setting and influence practices potentially enacted by people at all levels rather than a set of personal characteristics and attributes located in people at the top" (Leithwood, Jantzi, & McElheron-Hopkins, 2006, p. 20), which is what we found happening in all the schools and districts we studied. Toward this end, we sought data from the perspectives of those involved in these schools through the use of interviews with school and teacher leaders as well as other key informants (district-level administrators, support staff at both the school and district level, and occasionally both parents in leadership roles and school board members), and through observations and document analysis at each school/district site we studied. In all, we recorded more than 150 interviews or focus group participants, logged more than 300 hours of observations, and collected hundreds of documents.

This research looked through the lens of distributed leadership based on our goal of examining school leaders, the context of the schools, and myriad groups and individuals within each school in an effort to begin to understand ways our identified exemplary leaders organized, implemented, and promoted student achievement, school success, technology implementation, and teacher involvement.

Spillane, Halverson, and Diamond (2001) have suggested that to understand leadership, it is important to look beyond what one person can do, or knows how to do, but look instead at what each person brings to the task, build on strengths, and collaboratively tackle the issue. They suggest, "Consequently, to understand the knowledge needed for leadership practice in these situations, one has to move beyond an analysis of individual knowledge and consider what these leaders know and do together" (p. 25). Their central premise is that school leadership is "understood as a distributed practice, stretched over the school's social and situational contexts" (p. 23).

Although Spillane and colleagues (2001) provided the notion of this distributed leadership style, others have contributed to the understanding and complexity of the idea. Gronn (2002) suggests that leadership is a dynamic concept, and Mayrowetz (2008) agreed that leadership is best when distributed or "stretched over" multiple people and that examining and understanding the tools they use would be helpful to understand the practice of leadership in schools. Her research suggests, "As distributed leadership initiatives in schools and empirical research continue to flourish, the field will benefit from scholarship that clearly articulates what is meant by *distributed leadership* in studies that are both responsive to central problems of practice and anchored in relevant theory" (p. 433). Murphy, Smylieb, Mayrowetz, and Louis (2009) found a strong participatory culture that is "predominately informal" resulted in greater understanding and helped understanding successful distributed leadership models (p. 203).

Our goal in this research was to explore multiple aspects of leadership in our exemplary schools; however, we do not believe it is enough to study these things without also understanding the goals of the leadership. We agree with Spillane and colleagues (2001) when they said,

> In order to gain insight on leadership practice, we need to understand a task as it unfolds from the perspective and through the "theories in use" of the practitioner. And we need to understand the knowledge, expertise, and skills that the leaders bring to the execution of the task. (p. 25)

Accordingly, in this study we looked at how leadership, in conjunction with the actions of other educators in the schools and districts we studied, contributed to the successful integration of technology as a lever for school improvement. In doing so, we hoped to provide a more nuanced picture of the role technology plays in school reform and school improvement and to reveal what else was going on in award-winning schools that used technology to reform/transform their schools. We used the following as a guidepost for our investigation:

We define school leadership as the identification, acquisition, allocation, coordination, and use of the social, material, and cultural resources necessary to establish the conditions for the possibility of innovation in teaching and learning. The distributed leadership framework incorporates the practice of those multiple individuals in a school who work at mobilizing and guiding school staff in the instructional innovation process. (Spillane, Diamond, & Jita, 2003, p. 535)

OUR EXEMPLARY SCHOOL DISTRICTS AND SCHOOLS

We selected our eight cases by using purposeful sampling (Patton, 1990) to identify a pool of potential schools based on their having received state or national awards as exemplary technology-using schools (e.g., from the International Society for Technology in Education [ISTE]), because they received more than one technology grant (e.g., IMPACT grants in North Carolina, Preparing Tomorrow's Teachers to Use Technology [PT3] grants from the federal government), and through a snowball system of nominations based on the school's or leader's reputation at the state or national level. The goal of this selection process was to identify what Yin (2008) calls *intrinsic* cases, so we could learn about successful practices of award-winning schools and their leaders that other schools could learn from and consider implementing themselves. Ultimately, eight schools were identified based on additional criteria that included geographic region, urban, suburban, and rural settings, school level, socioeconomic status, school size, and also accessibility, which included their willingness to allow us to do interviews and observations and also to collect documents (Levin & Schrum, 2012). Of the eight cases, five were traditional public schools, one was a public charter school, and two were magnet schools. School sizes ranged from 400 students to more than 2,000; however, in several of the cases, the entire school district also became part of the research site. The percentages of free and reduced-price lunch ranged from 33% to as high as 90%. The schools were located in the following states: California, Colorado, Maryland, Michigan, Minnesota, North Carolina, Virginia, and Washington. Despite the differences of the schools, they were all recognized as places where technology was used and recognized as an integral part of transforming their schools.

Of course, each school and district was situated by its unique demographics, history, and culture, but together the cases elucidate how technology was leveraged for school improvement with a focus on the ways each school's faculty and leadership teams transformed their context into an exemplary, award-winning school. The leaders in these places used a

wide variety of methods to accomplish their tasks, but all were able to provide insight into their methods of moving their schools and districts toward their goals.

Data analysis was based on transcriptions of interviews and detailed content analysis of observations and documents to identify the practices used by the leadership in these schools. We used the constant comparative analysis method (Lincoln & Guba, 1985; Merriam, 1997) to analyze the data both within case and the across the cases (Miles & Huberman, 1994). In addition, the researchers established a procedure of peer-debrief each day after data collection to assure fidelity of coding and identify emergent themes.

ORGANIZING GRAPHICAL PERSPECTIVE

It is important to situate this book and our investigations within the structure of systemic thinking about change. This is essential because we know that each educational organization is made up of interacting, interrelated, and interdependent components. Based on our research findings, we agree with the literature that suggests these components must work together when making changes if they are to be sustained and embraced by all (Adamy & Heinecke, 2005; Kopcha, 2010). Further, our research showed us that all parts of a system have to be addressed in concert, and adding one component (like technology), or changing one part, is not enough to make a difference. An educational system can also be seen as a community situated within a specific type of environment, and both the context and environment interact to influence the entire system. In sum, we believe that taking this approach helps us understand how exemplary school and district leaders have been able to leverage technology to organize, implement, and promote student engagement and achievement, increase school success, and reinvigorate teachers.

To represent our belief in the interactional nature of undertaking change and implementing reform efforts, we use a graphic of a pie with eight pieces, each representing one portion of the task (and thus aligned with one chapter in this book). You may wonder if each piece of this pie is equally important or if some slices are more essential than others. Or, to frame it another way, you may question if it is reasonable to begin at the easiest part for your context and work up to the others. In our mind, all the pieces are equally important and ideally should be addressed (nearly) simultaneously, but some may emerge as more urgent at one time or another. We trust you will determine the appropriate way to respond to these challenges that may arise, although we hope that hearing how other leaders have addressed each piece of the pie may be helpful. Each chapter will begin with this graphic and end with it, as a way to take from each chapter the essential guidelines to remember.
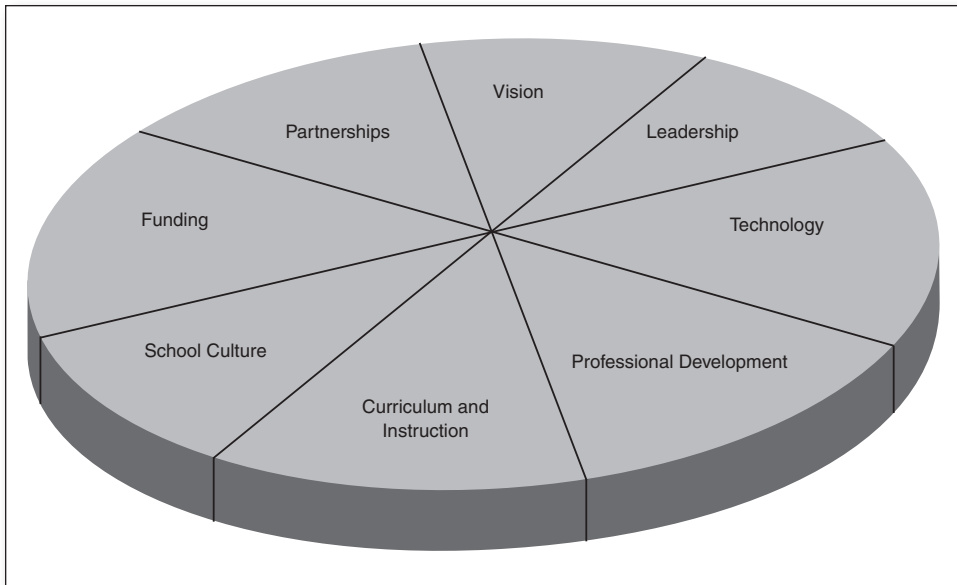
It is also worth noting that many terms are used interchangeably for what we consider together as examples of technology: Web 2.0, instructional technology, educational technology, computing, digital tools, and so on. We have chosen a term used rather widely within the global community, information and communication technologies (ICT). Thus, we will frequently use the acronym to denote the entire spectrum of technologies, digital resources and tools, hardware, software, and peripherals.

ORGANIZATION AND SPECIAL FEATURES OF THE BOOK

This book looks across the specific cases and extracts information on the topics of importance to school leaders. The chapters in this book are:

- Chapter 1: A Path to a 21st Century Education: The Role of Vision and Mission
- Chapter 2: Implementing the Vision: What Is Leadership in a 21st Century School?
- Chapter 3: What About the Pipes, Wires, and More? Planning and Supporting Technology in 21st Century Education
- Chapter 4: Supporting 21st Century Educators' Efforts: Models of Professional Development to Support Change
- Chapter 5: What Does a 21st Century Classroom Look Like? How Curriculum and Instructional Practices Change
- Chapter 6: Setting the Stage: The Importance of Attending to School Culture

- Chapter 7: Ideas About Funding 21st Century Technology Initiatives: Tools, Options, and Resources
- Chapter 8: Reaching Out to Parents, Families, and the Community: Creating Partnerships Is a Win-Win Proposition

Each chapter offers an in-depth look at one of these topics from the perspective of the leaders we interviewed and the schools and districts we visited. Each chapter begins with a vignette about the leadership in a school or district that exemplifies the focus of the chapter. Specific learning objectives, which we call key concepts, for each chapter follow. We then briefly review the research literature on these topics and provide numerous examples of how the leaders we studied addressed issues related to the main concepts addressed within each chapter. Each chapter also includes materials for further exploration, including books and websites, as well as important organizations with which you may not be familiar, major lessons learned from our experiences, and questions for self-study or book club discussions.

The chapters also provide information from the schools that we believe may be useful in thinking about your own context, including some materials our participants happily share with colleagues. We hope these may be places to begin and may offer ideas for customizing your own adventures in leveraging the power of technology to engage, encourage, and support new ways of teaching and learning.