Preface

For more than a century, children have learned at a distance from their teachers. Correspondence lessons were the primary education mechanism for children of remote farmers, migrant workers, and others. Beginning in the 1990s, the Internet replaced mail, radio, and fax transmissions for many students. So far tens of thousands of students at the primary and secondary levels in the U.S. have taken online courses. The total represents a very small proportion of the more than 50 million students, but the number of students in virtual schools on a full-time or part-time basis is growing rapidly. The primary and elementary school levels are experiencing the greatest rate of growth. The number of virtual schools in North America is currently around 100, and the number continues to grow. The movement of students and teachers into virtual schools has important implications for education at all levels. It is time to explore the impact of virtual schools on elementary and secondary education.

Virtual schools are a result of widespread changes in knowledge about learning, in available technology, and in society. As we learn more about learning styles, brain-based learning, and differentiated instruction, we realize the value of technology, including distance education, in meeting the unique needs of all learners. The U.S. Census Bureau in 2001 reported that two-thirds of children lived in homes with computers, and 90 percent of school age children have access to computers. Half of homes were able to access the Internet, and children lead adults in their use of computer-mediated communication technologies. As adult use of distance learning grows in postsecondary education and professional development, parents will be more welcoming of distance learning for their children. Because today's students grow up as natives

in the digital world, they think and work fluently with multimedia and technology, and they expect teachers to incorporate technology into teaching and learning. Students who are unsatisfied with the disconnect between traditional schooling and their natural digital habitat may be drawn to and succeed in virtual schools. A challenge will be keeping up with demand for virtual schools and upholding quality in virtual schools.

Not all parents, administrators, or community members agree that virtual schooling is an effective answer to the changing educational needs of digital-age children. Many students and parents choose virtual schooling because of the independent nature of the study, the flexibility of the scheduling, or the opportunities offered that may be absent in local schools. However, some say that distance education is unproven at primary and secondary levels, and that many of the issues have not been satisfactorily addressed. Critics and skeptics of virtual schooling say that students experience social isolation, that cheating is easy, that the human dimension of education is missing, and that "seat time" or "contact time" in virtual schools between teacher and student is not equivalent to that in schools and classrooms. Will virtual school students be prepared for life in a diverse culture? Will they succeed in the workplace and in family life?

While scholarly examination of distance learning at the primary and secondary levels is extensive, encompassing decades of study and a wide range of delivery methods, study of virtual schools at the K-12 level is in its infancy. Enough is known to bring together a review of best practice from concept and development, through implementation and evaluation. Virtual schooling will continue to attract students because of the benefits it offers over traditional schooling, and clients of virtual schools need information to guide their decisions. For the foreseeable future, virtual schools will continue to meet diverse students' needs, and to evolve in response to further change.

The purpose for this book is to share knowledge of issues and trends in virtual schooling, from the perspectives of virtual school administrators, course developers, educators, students, and other stakeholders. At a time when virtual schools represent the preferred education choice for steadily growing numbers of students, it is essential that we understand their strengths and limitations, the unique contributions and requirements of virtual schools. The information presented in the following chapters will aid virtual school planners, managers and educators to maximize their efforts for the education of students.

Organization of the Book

The book is organized into four sections. The first section raises issues related to the administration of virtual schools. This section presents an overview of virtual schools including a look at their emergence. Benefits are discussed, along with problems, solutions and future trends. The unique nature of virtual schools gives rise to unique challenges for administrators and planners of virtual schools. Virtual school managers must balance the needs of children, teachers, parents, and others in the education community, none of whom are likely to meet in person. In addition, the virtual school must make its curriculum accessible to learners who "attend" from many locations, at any time of day, for many reasons. The chapters in this section offer lessons learned from experienced virtual school developers and administrators.

The second section delves into standards used by virtual schools to ensure quality and accessibility of the educational experience. Virtual schools are operated by several types of organizations, ranging from states, public school systems and universities to private schools and home schools. As a way of communicating to stakeholders its interest in high quality education, a virtual school may choose to pursue accreditation by a local, regional or national accrediting agency. Accreditation standards vary according to the mission of the accrediting agency. Virtual schools, operating largely online, may also choose to meet accessibility standards to ensure that their curriculum is accessible by all students. This section describes the accreditation and accessibility standards in the context of virtual schools.

Section III concentrates on the people at the front lines of virtual schooling: the teachers and course developers. It has been said that the practices in instructional design and teaching that work in face-to-face education are also effective in distance learning, but there are many distinctive features of virtual schooling. While the values and philosophies that make great teachers are shared by all teachers, they are expressed in special ways in the online environment. Gifted online teachers require special forms of support and specific forms of course design. The chapters in Section III provide case studies of successful virtual school educators and the professional development programs that enable them to continually improve.

The final section focuses on the processes of education in the virtual school. The nature of digital content presents possibilities for teaching and learning that have the potential to transform and enhance learning. The roles of teach-

ers and students shift in the virtual school setting, and the challenge of course designers is exploiting the strengths of the virtual classroom. The tools available to virtual course designers and teachers are continually developing and changing. One of the responsibilities in online education is selecting and using the tools that are best suited to the needs of students and the demands of curriculum. Section IV describes new tools and their applications in specific virtual school situations.

Chapter I investigates some of the critical issues associated with virtual schools. It reviews historical forms of school education, and the different types of virtual schools that are currently emerging. The educational value of virtual schooling is considered in terms of cognitive and affective outcomes, and some of the factors that promote the rise of virtual schools are outlined. The implications of related philosophical viewpoints and communication theory are explored, together with the benefits and disadvantages of virtual schools for society. A number of problems associated with virtual schools are identified, and some possible solutions are outlined. Future trends in the growth of virtual schooling and the characteristics of the next generation of virtual schools are discussed in terms of their implications for school education.

Chapter II takes us on a tour of the design, development, and implementation of a virtual school. There were no other public schools in the state which had initiated such a program, and no other public school in the country had developed a distance learning system for middle school students. Lang identifies budgetary and evaluation issues as well as perceptions of staff. She also identifies future trends in technology which may result in new pedagogy.

Chapter III describes the Canadian experience with virtual schooling, discusses administrative issues, and outlines trends. Haughey and Muirhead begin with a brief overview of the development of virtual schooling in Canada from its initial development in Alberta in 1996 with more than 20 schooling programs, to its rapid expansion across Canada. The chapter identifies administrative issues that have arisen and that are in some ways unique to online schooling, ranging from admission requirements to course development, and from parent support to funding. Also included are ongoing issues related to educational leadership such as issues of supervision of teachers, quality of instruction, and provision of professional development. The chapter concludes with an outline of likely trends and their implications.

Chapter IV centers on quality guidelines and standards. C. Cavanaugh outlines a distance learning development and implementation cycle consisting of three stages: (1) procurement and preparation of the resources necessary to meet the distance education goals, (2) delivery of instruction using the best

practices from education, business and research, and (3) analysis of the results of distance education to gauge achievement of the goals. The chapter explores the interconnect between the success factors of the Resources - Practices - Results (RPR**)** cycle and standards published by agencies accrediting virtual schools. A survey of 67 virtual schools in the U.S. in the spring of 2003 resulted in identification of accrediting standards applied to virtual schools at national, regional and state levels. The standards of accrediting bodies are examined and compared to the RPR success factors.

Chapter V addresses the important role of virtual schools in educating students with special needs. When creating online instruction it is important to follow the accessibility standards and guidelines such as the Section 508 and W3C accessibility standards to enable persons with disabilities access to educational material. Within the U.S., more than 26,000 K-12 students classified as hospital/homebound received education through some form of distance education. Case studies of a hospital/homebound program, online programs used by a school for students with disabilities, and a state public online school and its interactions with students with disabilities are presented. The results of a survey of online schools and the schools' services for students with disabilities are also reported.

Chapter VI takes us inside the teaching process at Florida Virtual School as the following essential characteristics of online teaching are highlighted: communication, teamwork, flexibility, student-centered learning and love of students. Using technology as a tool to design and deliver curriculum and instruction, the virtual learning environment mirrors the technological world that students live in today and will work in tomorrow. Virtual education changes the way teachers teach and interact with other teachers, with students, and with parents. Virtual educators are reshaping the routine learning modes of the traditional school day into a dynamic interactive, real-world learning environment that presents choices to parents and students and requires students to take ownership of the learning process.

Chapter VII continues the focus on teachers by describing the effective professional development that is needed to help educators learn to organize content for online delivery, convert instructional materials to online formats, use advanced multimedia tools, and integrate technology resources in online learning environments. Hinson and Bordelon address standards for technology-supported instruction and staff development, models of effective face-to-face professional development along with adaptations for online educators and professional development programs currently available to online educators. Recommendations for effective professional development are also provided.

Chapter VIII discusses ways that the nature of digital content and tools coupled with the communications capabilities available through online instruction can, if leveraged properly, provide opportunities for quality instructional delivery. Schnitz and Azbell propose that even in an environment of remote, asynchronous, web-based instructional approaches and the best of effective classroom practices may not be sufficient to address the full range of capabilities the technology provides. Through work done by IBM and the Florida Virtual School (FLVS), principles and models for leveraging the advantages offered by the technology environment and overcoming the difficulties inherent have been worked out that offer significant promise to all providers of virtual schooling.

Chapter IX presents the viewpoint of managing virtual classes in rural school districts. As rural communities and schools decline in size, educational policy makers often question their viability. In the Canadian province of Newfoundland and Labrador and in New Zealand, new educational structures based on digital networking, using the Internet, have been developed for the delivery of education to rural schools. Within these electronic educational structures senior students in rural high schools have been provided with extended curriculum choice through a combination of on-site and on-line instruction. This has led to three challenges: the administration of electronically inter-connected rural schools; the integration of physical and virtual classes and the need to find pedagogy that is appropriate for e-teaching and e-learning. The new educational structures in rural Newfoundland and New Zealand have extended traditional classrooms in terms of time, space, organisation and capacity.

Chapter X provides a set of case studies and vignettes of actual delivery and receiving classes to highlight pedagogical limitations and potentials of the Virtual Schooling Service in Queensland, Australia. Critical success factors for pedagogical effectiveness are documented along with a reflection on these elements using Activity Theory. The chapter concludes with an update of the current initiatives being undertaken to enhance the pedagogical effectiveness of the Virtual Schooling Service. Pendergast and Kapitske focus on one element of the evaluation of the service-pedagogical effectiveness.

Chapter XI illustrates an evaluation tool used by teachers and researchers to study the impact of computer-mediated collaborative and communication technologies used in K-12 education. Standard usability engineering methods and tools focus on individual users at a single workstation. Networked collaborative systems, however, present the challenge of multiple users interacting at a variety of times and places. Carroll, Neale and Isenhour developed a web forum tool to capture and display user critical incident reports and threaded

discussions of these reports by users, evaluators, and system developers. The Collaborative Critical Incident Tool (CCIT) is effective at evoking detailed usability evaluation information, as well as reflective analysis of usability issues from diverse points of view among stakeholders in the system.

Chapter XII outlines a university-science center partnership called Science Net that has been functioning as a virtual school for the extension education of the global public in general and the Singapore public in particular. Tan Wee Hin and Subramaniam describe the design, implementation mechanics and learning potential of this online school for non-formal science education, and suggest that it is an innovative experiment to expand the communicative space of learning in society.

The Appendix offers a Directory of Online K-12 Schools that, while not exhaustive, is comprehensive and includes schools in several countries. The schools' names, locations and web addresses are included.

Scholarly study and reporting on K-12 virtual schools has now begun, and further development of the literature of virtual school research is important for several reasons. Virtual schools serve a population of students at the primary and secondary levels who have characteristics and needs different from those of adult learners served by other forms of distance education. Virtual schools are a relatively new form of education, but one that is growing rapidly in importance. Teaching at a distance requires special skills, and teaching children at a distance requires specific adaptation of those skills. The trends in technology, education, and society that have led to the creation of virtual schools show signs of continuing rapid change. If the education community hopes to influence the future direction of virtual schooling, continued research and reports such as the chapters in this book are needed in order to inform the practice of virtual schooling.

Development and Management of Virtual Schools: Issues and Trends

Administrative Issues

- Virtual Schools: A Critical View
- Administering a Virtual School
- Managing Virtual Schools: The Canadian Experience

Standards and Accreditation

- Distance Learning Success Factors in the RPR Cycle and Virtual School Accreditation
- Distance Learning as a Form of Accommodation

Virtual School Educators

- Teaching Any Time, Any Place, Any Pace
- Professional Development Recommendations for Online Course Designers

Course Development and Implementation

- Instructional Design Factors and Requirements for Online Courses and Modules
- The Management of Virtual Classes in School District Digital Intranets
- Virtual Vignettes and Pedagogical Potentials
- Collaborataive Critical Incident Tool: Supporting Reflection and Evaluation in a Web Community
- Science Net: A Virtual School for the Extension (Science) Education of the Public in Singapore