ONLINE, BLENDED, AND DISTANCE EDUCATION IN SCHOOLS

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An Introduction

Tom Clark and Michael K. Barbour

The last decade has seen dramatic growth in the use of online, blended, and distance learning approaches in elementary and secondary education around the world. Online learning is a type of distance education, the key element of which is "the separation of teacher and learner during . . . a majority of the instructional process" (Verduin & Clark, 1991, p. 11). Watson and Kalmon (2005) defined *online learning* as "education in which instruction and content are delivered primarily over the Internet."

As depicted in Table 1.1, the history of K–12[1] online learning begins with the concepts and systems that made it possible. The independent study high school launched by the University of Nebraska in the 1920s served as a model for distance and online learning programs later on. Enrollments in 1935 were almost all at the University of Nebraska. By 2004–2005, K–12 independent study enrollments peaked at 174,000 nationwide, but about 40% were in online courses (D. Gearhart, personal communication, March 31, 2006).

A wide variety of distance education technologies were used in K–12 education in the United States from the 1930s through the inception of web-based instruction in 1991. Educational radio broadcasts began in 1921 at the Ohio School of the Air (Saettler, 2004). The Wisconsin School of the Air served 330,000 students in classrooms at its peak in 1996 (Bianchi, 2002). Educational television programming began in 1933 at the University of Iowa (Kurtz, 1959), and a network of educational television stations began to appear in the 1950s, after the Federal Communications Commission (1952) reserved TV channels for this purpose. Educational broadcasts from airplane-based transmitters began in 1961 (Jajkowski, 2004), but were supplanted when educational satellite broadcasts began in 1971 (Singh, Morgan & Rosenbaum, 1972). By 1985 the TI-IN network provided high school courses to 150 receive sites in 12 states (Pease & Tinsley, 1986). In the 1980s and 1990s, many states and regions developed broadband networks for educational video programming and other purposes (Hezel Associates, 1998).

TABLE 1.1:
Key dates in the history of K–12 distance and online learning

1921	Educational radio broadcasting begins at Ohio School of the Air
1929	University of Nebraska begins supervised independent study high school
1951	School of the Air launched in Australia
1953	Educational television broadcasting begins at University of Iowa
1961	Purdue University pioneers airplane-based K–12 instruction
1965	Computer-based K–12 learning experiments at Stanford, and a year later at Illinois
1971	Educational broadcasting via geosynchronous satellite begins using NASA's ATS-1
1980s	Audio and computer conferencing technologies used in K–12 instruction
1980	Development of USENET
1982	Development of SMTP e-mail and Internet Protocol Suite
1987	Norwegian distance learning expert Morten Paulsen predicts creation of a "virtual school"
1989	Timothy Berners-Lee demonstrates key functionalities of the World Wide Web
1990s	Many states and regions develop broadband networks for K–12 instruction and other uses
1996	University of Nebraska's CLASS program, Florida Virtual High School, and the VHS consortium begin offering web-based high school courses during the school year
1996	Florida Virtual School launched; many state virtual schools follow
2000	Online charter school provider K12 Inc. founded; Connections Academy launched a year later
2009	State virtual school programs exist in 27 states, report 320,000 course enrollments
	Full-time online schools exist in 24 states, enroll about 175,000 students
2011	More than a million estimated enrollments in K–12 online learning
2013	State virtual school programs exist in 26 states, report 740,000 course enrollments
	Full-time online schools exist in 29 states, enroll 310,000 students
	More than 75% of school districts offer online or blended learning options
2014	State virtual schools served 741,516 course enrollments (one student enrolled in one semester-long course) in 26 states in SY 2013–14.
	Fully online schools served 316,320 students in 30 states in SY 2013–14.

Note. Clark (2012); Watson, Murin, Vashaw, & Gemin (2014)

A series of technological breakthroughs set the stage for the emergence of web-based instruction. Networked computers, the Internet, e-mail, the Web, and broadband were all needed before Morten Paulsen's 1987 vision of a "virtual school" became a reality in the 1990s and 2000s. A virtual school is "an educational organization that offers K–12 courses through Internet- or Web-based methods" (Clark, 2001, p. 1). Laurel Springs School probably offered the first K–12 online program in 1991, using text-based distance education for course delivery in the pre-web era (Laurel Springs School, 2011). University of Nebraska's CLASS program (Smith & Northrup, 1998), Florida Virtual High School (Florida Taxwatch Center, 2007), and the Virtual High School Consortium (Kozma, Zucker, & Espinoza, 1998) all began offering web-based high school courses during the 1996–1997 school year.

The U.S. Department of Education estimated over 1.8 million enrollments in K–12 distance education courses in 2009–2010, many of which were in online courses (Queen & Lewis, 2011). The number of U.S. enrollments, specifically in K–12 online courses, grew to well over a million by 2010–2011 (Watson et al., 2011). From 2009 to 2013, the number of state virtual schools offering state-supported supplemental online learning stagnated, while the number of full-time programs grew, but both types of programs experienced robust enrollment growth. By 2013, 26 of the 50 U.S. states had state virtual schools, a decrease of one state since 2009, while 29 states had fully online multidistrict online schools, an increase of five states during the same four-year period. Course enrollments in state virtual schools grew 119% during this period, while student enrollments in fully online multidistrict programs grew 77%.

District-led programs were also growing rapidly in numbers and enrollments. By 2013, researchers estimated that more than 75% of school districts in the United States offered online or blended learning options (Watson, Murin, Vashaw, Gemin & Rapp, 2013). Other program types saw little growth in 2013-2014. Course enrollments in the 26 state-level virtual schools had leveled off at about 742,000, a 1% increase from the prior year. Full-time online schools served students in one more state than in 2012-2013. Their 316,000 enrollments represented a 2% increase (Watson, Pape, Murin, Vashaw, & Gemin, 2014).

The emergence of K–12 blended learning has brought online learning into the mainstream. Piccianno and Seaman (2009) defined *blended learning* as "part online and part traditional face-to-face instruction" (p. 1). Staker and Horn (2012) defined *blended learning* as "a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path, and/or pace, and at least in part at a supervised brick-and-mortar location away from home" (p. 3).

Internationally, there has been a similar explosion of K–12 online and blended learning activity in the last few years. In Canada, the estimated number of online enrollments grew from around 25,000 to 245,000 during the 2000s (Barbour, 2012b). Among 54 countries responding to a 2010 survey, 65% reported that online and blended learning opportunities were available to at least some students (Barbour et al., 2011). In 2011, five years after opening its first online school, China reported about 600,000 enrollments in 200 online schools.

Consideration of the rapidly evolving field led us to ask the following question: What are some key policy and practice needs in the field that might be addressed through advice from experts and program leaders? We believe that the tremendous growth in K–12 online and blended learning programs in recent years is creating new needs for policy development, infrastructure building, teacher/leader training, and program development in areas such as curriculum, instruction, technology, and management.

As blended learning approaches bring online learning into the K–12 mainstream, universities need to prepare K–12 teachers and administrators for the incorporation of online and blended learning into their professional practice. K–12 educators need to learn new ways of teaching and supporting learning. Policymakers need to address related policy and funding issues. This book is designed to meet these needs through chapters contributed by experienced practitioners and experts in the field on key program components and important policy issues.

While North America has taken the lead in development of K–12 online learning and the number of students participating is growing, whether this is having a positive educational impact on student achievement is not yet clear (Barbour, 2012a). The United States has fallen behind many other nations in high school student achievement, based upon recent Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) international assessments. This movement is especially alarming because, over the long run, K–12 educational outcomes tend to predict a nation's gross domestic product (Hanushek & Woessmann, 2010). This raises the question: What can North American educators learn from other nations about online, blended, and distance learning? Conversely, as they expand their programs, international educators want to know, *What can we learn from North American programs?* Through the contributed chapters in this book, we seek to provide illustrative program examples from North America and around the world that explore the issues and challenges that programs face, the lessons they have learned, and what they would share with others.

There is also a tremendous need for research in the emerging field of K–12 distance, online, and blended learning. The existing research on K–12 online and distance learning is limited, and the need to study blended learning as well only adds to this challenge. Therefore, we have encouraged chapter authors to reference the related research as feasible in their analyses of key program components, policy issues, and case studies of programs in North America and around the world. The contributed chapters in this book are organized into four parts. We, the coeditors, authored this introductory chapter in Part One, "Overview," and the concluding chapter in Part Four, "Summary Thoughts." Contributor chapters are presented in Part Two, "Research and Policy," and Part Three, "Case Studies on Practice."

Research and Policy

The first three chapters in Part Two address quality online teaching, curriculum, and technology, three key components of a K–12 online and blended learning program. Several of the case study chapters presented in the next section address the fourth key program component: management. The last three chapters in this section address research on K–12 online learning, full-time online charter schools, and equitable access.

In Chapter 2, Kathryn Kennedy and Leanna Archambault focus on ways of identifying, evaluating, and fostering quality K–12 online teaching. These include research-based online pedagogy, frameworks and standards for evaluating online teaching, and ways to foster quality online teaching, including coursework, field experiences, endorsements, certificates, and professional development. They also explore ways to restructure teacher education to prepare teachers for online and blended teaching.

Christy G. Keeler introduces instructional design principles for online teachers and course developers in Chapter 3. She differentiates between traditional and online instructional design issues, and outlines elements necessary when designing online courses at both the macro and micro levels. She argues for a new perspective of instructional design as it relates to online and blended learning.

In Chapter 4, Rob Darrow addresses technology infrastructure, tools, and costs. He explores issues such as connectivity and hardware, learning management systems, and mobile learning devices. He describes tools for communication, social media, and gaming, as well as online content, open education resources, and learning objects. He advocates the use of planning cycles with cost projections, and identifies cost components of online programs that must be considered.

Richard E. Ferdig, Cathy Cavanaugh, and Joseph R. Freidhoff respond in Chapter 5 to this question—What does the research on K–12 online learning tell us?—by encouraging researchers to ask the right questions, answer the critics, and appreciate the complexity. They say researchers should study where online learning works best, and note that some online programs are not high quality. Ferdig, Cavanaugh, and Freidhoff see the distributed nature of online learning as raising new complexities for researchers. They conclude by highlighting effective practice resources.

Victoria Raish and Ali Carr-Chellman provide a case study in Chapter 6 on Pennsylvania cyber charter schools, or charter schools whose coursework is delivered primarily via the Internet. The authors explore the origins and legislative context of cyber charters, evaluations and research on their effectiveness, issues surrounding how they are funded, and the legal and ethical issues they raise. They conclude with recommendations for future research on cyber charters.

In Chapter 7, Raymond M. Rose, Alese Smith, Karen Johnson, and David Glick explore the issues surrounding equitable access in online learning, including equitable access to technology, online courses, and quality instruction. They discuss challenges raised by online learning but also ways that online learning can be used to address equity issues. The chapter concludes with an Access and Equity Checklist for administrators and other stakeholders.

Case Studies on Practice

In Part Three of the book, chapter authors present nine case studies of online and blended programs. Three of the four U.S. case studies illustrate the most common categories of online learning programs in that county—state-led, charter school, and district-led. The fourth documents a program that prepares educators for online teaching, a key component of online learning programs. Case studies of private schools are presented in chapters from Canada and Australia, while barriers to online learning programs in developing nations are explored through a case study on Nepal. The next case study explores the integration of e-learning in selected schools in the United Kingdom, while the final case study describes a national e-learning system for K–12 students in South Korea.

In Chapter 8, Kevin Oliver and Tracy Weeks present a case study of a new state virtual school, the North Carolina Virtual Public School (NCVPS), as informed by program- and project-level evaluation. This chapter addresses program management issues through the lens of evaluation. The authors argue that evaluation can help online learning providers improve their programs and encourage student success. They describe how NCVPS used evaluation findings during its startup period to revise approaches to course design, teaching, policy, and more.

In Chapter 9, Dazhi Yang and Kerry Rice present a case study of Boise State University's state-approved K–12 Online Teaching Endorsement program. Beginning with the research on teaching and standards, and standards development by the state of Idaho, they then describe the program's development and implementation, as well as challenges faced and how they were resolved.

Mickey Revenaugh presents in Chapter 10 a case study of the startup of the Nexus Academy blended charter schools by Connections Academy in two states. She describes how a series of pilots led to development of their own approach to blended learning, which is structured around data-driven personalized learning for every student in a small high school setting. Implementation challenges and lessons learned are described, along with potential applications of such blended models.

In Chapter 11, Jhone M. Ebert and Allison Powell offer a case study on the evolution of a district-led virtual school program in Nevada. District-led programs are the fastest-growing sector of K–12 online learning, and they frequently include blended learning initiatives. The authors describe how online learning and blended learning are being mainstreamed in this large district and share some effective practices.

John Smallwood, Jennifer Reaburn, and Stephen Baker present a study in Chapter 12 of the development of one private online school, Virtual High School (Ontario), from its inception in the mid-1990s to the present day. They document the philosophy, growth, and operations of this school's student-centric, highly challenging, and successful educational model.

In Chapter 13, Cathy Cavanaugh addresses the potential for online and blended learning to meet the needs of all students, based on the case of Nepal, a least-developed country that faces many challenges in its readiness for virtual education. She documents the many barriers faced, but also the success of Open Learning Exchange Nepal, which provides resources, such as an online repository of activities and books, that some public primary schools use. She argues that sustained access to quality educational resources and experiences requires a sustained commitment from governments and agencies.

In Chapter 14, Stephen Harris describes the evolving role of the Sydney Centre for Innovation in Learning, a unit of North Beaches Christian School, in the provision of K–12 online learning. He describes development of the school's model of online and blended learning and the expansion of its educational role in New South Wales. He explains how state-level policy issues have limited growth of online programs in Australia.

Helen Boulton and Lisa Hasler Waters describe in Chapter 15 the use of virtual learning environments (VLEs) to personalize education. The authors see VLEs as the next generation of technology integration. They focus on five schools across the United Kingdom that constitute a diverse cross section of primary and secondary schools, and of virtual and brick-and-mortar schools. They consider how the personalization achieved via VLEs reflects each school's values and mission.

In Chapter 16, Hyeonjin Kim and Jeonghee Seo present the case of Korea's national e-learning system for elementary and secondary students and teachers, the Cyber Home Learning System, which was launched in 2005 with the aim of reducing private tuition expenses and the educational gap between high- and low-income families. The authors review the school's evolution and effectiveness. They conclude with recommendations

for improving the system and using it to support the nation's new Smart Education initiative for a 21st-century knowledge society.

The book concludes with a chapter by the coeditors in which we synthesize key findings and lessons learned, and present a global vision for the future of K–12 distance and online learning.

A companion resource for the book is available online. This Classroom Resources Wiki (onlineblendedschooling.wikispaces.com) includes chapter questions, reference links, and related resources.

Note

1. In the United States and Canada, elementary and secondary education is frequently referred to in short as K–12 education (kindergarten through 12th grade). Therefore, learning in schools is often called K–12 learning.

References

Barbour, M. (2012a). The landscape of K–12 online learning. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 574–593). New York: Routledge.

Barbour, M. (2012b). *State of the nation: K–12 online learning in Canada* 5th ed. Victoria, BC: Open School BC / Vienna, VA: International Association for K–12 Online Learning. Retrieved from http://www.openschool.bc.ca/pdfs/iNACOL_CanadaStudy_2012.pdf

Barbour, M., Brown, R., Waters. L. H., Hoey, R., Hunt, J. L., Kennedy, K., . . . Trimm, T. (2011). *Online and blended learning: A survey of policy and practice around the world*. Vienna, VA: International Association for K–12 Online Learning.

Bianchi, W. (2002). The Wisconsin School of the Air: Success story with implications. *Educational Technology & Society, 5*(1), 141–147.

Clark, T. (2001). *Virtual schools: Issues and trends*. Phoenix: WestEd. Retrieved from http://www.wested.org/online_pubs/virtualschools.pdf

Clark, T. (2012, September). History of K–12 online learning. In M. K. Barbour (Ed.), *Virtual school MOOC: Introduction to K–12 online learning research (10 September–07 October 2012)*. Retrieved from http://virtualschoolmooc.wikispaces.com

Federal Communications Commission. (1952). *Fourth report and order*. Washington, DC: Author.

Florida Taxwatch Center for Educational Performance and Accountability. (2007). *Final report: A comprehensive assessment of Florida Virtual School*. Tallahassee, FL: Author. Retrieved from www.flvs.net/areas/aboutus/Documents/Research/TaxWatch%20Study.pdf

Hanushek, E. A., & Woessmann, L. (2010). *The high cost of low educational performance*. Paris: Program for International Student Assessment, Organisation for Economic Co-operation and Development.

Hezel Associates. (1998). *Educational telecommunications and distance learning: The state-by-state analysis, 1998–99*. Syracuse, NY: Author.

Jajkowski. S. (2004). *MPATI: The flying classroom*. Retrieved from http://www.chicagotelevision.com/MPATI.htm

Kozma, R. B., Zucker, A., & Espinoza, C. (1998). *An evaluation of the Virtual High School after one year of operation*. Retrieved from http://thevhscollaborative.org/sites/default/files/public/Evaluation%20after%20yr%201.pdf

Kurtz, B. E. (1959). *Pioneering in educational television, 1932–1939.* Iowa City: State University of Iowa.

Laurel Springs School. (2011). *Laurel Springs celebrates 20 years of distance learning.* Retrieved from http://laurelsprings.com/2011/05/20/laurel-springs-20-years

Pease, P. S., & Tinsley, P. J. (1986, October). *Reaching rural schools using an interactive satellite based educational network.* Paper presented at the annual conference of the National Rural and Small Schools Consortium, Bellingham, WA. (ERIC Document Reproduction Service No. ED281681)

Picciano, A. G., & Seaman, J. (2009). *K–12 online learning: A 2008 follow-up of the survey of U.S. school district administrators.* Needham, MA: BABSON Survey Research Group & Sloan Consortium.

Queen, B., & Lewis, L. (2011). *Distance education courses for public elementary and secondary school students: 2009–10* (NCES 2012-009). U.S. Department of Education, National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubs2012/2012008.pdf

Saettler, L. P. (2004). *The evolution of American educational technology.* Charlotte, NC: Information Age Publishing.

Singh, J. P., Morgan, R. P., & Rosenbaum, F. J. (1972). Satellite networks for education. In *Proceedings of the International Telemetering Conference* (pp. 419–439). Woodland Hills, CA: International Foundation for Telemetering.

Smith, K., & Northrup, K. (1998). The CLASS course design model for Web-based instruction. Washington, DC: General Services Administration. (ERIC ED 422877). Retrieved from http://files.eric.ed.gov/fulltext/ED422877.pdf

Staker, H., & Horn, M. B. (2012). *Classifying K–12 blended learning.* San Mateo, CA: Innosight Institute. Retrieved from http://www.innosightinstitute.org

Verduin, J. R., & Clark, T. (1991). *Distance education: The foundations of effective practice.* San Francisco: Jossey-Bass.

Watson, J., & Kalmon, S. (2005). *Keeping pace with K–12 online learning: A review of state-level policy and practice.* Naperville, IL: Learning Point Associates. Retrieved from www.kpk12.com/reports

Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2011). *Keeping pace with K–12 online learning: An annual review of policy and practice.* Evergreen, CO: Evergreen Education Group. Retrieved from http://kpk12.com/reports

Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2012). *Keeping pace with K–12 online & blended learning: An annual review of policy and practice.* Evergreen, CO: Evergreen Education Group. Retrieved from http://kpk12.com/reports

Watson, J., Pape, L., Murin, A., Vashaw, L., & Gemin, B. (2014). *Keeping pace with K–12 digital & blended learning: An annual review of policy and practice.* Durango, CO: Evergreen Education Group. Retrieved from http://kpk12.com/reports