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K-12 Online Learning: A Worldwide Perspective

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[CN]Chapter 4

[CT]K–12 Online Learning: A Worldwide Perspective

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[ABS]

K–12 online learning is often used as an umbrella term to describe all instances of kindergarten through 12th grade students' learning by using the Internet. This chapter will explore the state of K–12 online learning in North America and around the world. From correspondence education to complete online schools that are found in some school districts today, K–12 online learning is continuing to grow at seemingly exponential rates. Policies in various districts and countries, along with the individual needs of students and goals for the education system, have often dictated—or at least influenced—this development. In this chapter, we explore these developments in the United States, Canada, Mexico, Australia, New Zealand, Singapore, South Korea, and Turkey.

[/ABS]

K–12 online learning is continuing to grow in the United States. In 2010, there were 450,000 student enrollments in states' virtual schools and more than 2 million in online learning courses; additionally all 50 states and the District of Columbia offered some form of online learning to their K–12 students (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). Eighty percent of school districts around the United States offer online learning opportunities to K–12 students, and 50% of districts are exploring ways to start home-grown online learning initiatives (Watson, Murin, Vashaw, Gemin, & Rapp, 2010). Described as a way to learn anywhere at any time, K–12 online learning has grown significantly as a viable educational choice, often because cyber charter schools have been marketed either as a school choice or as an alternative for homeschooling students. In fact, a recent prediction claims online learning will encompass half of U.S. K–12 education by the year 2020 (Christensen, Johnson, & Horn, 2011).

The K–12 online learning phenomenon is not exclusive to the United States. In a 2009 interview with *THE Journal: Transforming Education Through Technology*, President of the International Association for K–12 Online Learning (iNACOL) Susan Patrick explained that many countries were blazing trails for K–12 online learning. Since 2003, Mexico has trained its preservice teachers to teach online and to use digital content to enhance learning environments, and China is following in Mexico's footsteps (Nagel, 2009). Approximately 5% of all K-12 students in Canada have access to online learning (Barbour, 2012). In Singapore, 100% of teachers are trained to teach online. In Australia, New South Wales is harnessing K–12 online learning by offering children in remote and isolated places a chance to take courses to which students in the more populated areas have direct access (Powell, 2008). Later in this chapter, additional countries' online programs will be highlighted.

The rest of this chapter outlines the growth of K–12 online learning and discusses current developments in online education. Definitions used in the field of K–12 online learning will be demystified, and models of virtual schools will be presented in the first section of this chapter. Then, the current state of virtual schooling in the United States will be shared, followed by a discussion of K–12 online learning activities in Canada and Mexico. Finally, we will end with a discussion of K–12 online learning in countries outside North America, with specific information on Australia, New Zealand, Singapore, South Korea, and Turkey.

[A]Virtual Schools, Cyber Schools—What’s the Difference?

Words used in the field of K–12 online learning are abundant and confusing at times, especially when media and practitioners use them interchangeably. To demystify this collection of terminology, we have consulted various sources to distinguish between one term and another. The terms that will be defined here include brick-and-mortar school, virtual school, cyber school, blended learning and blended programs, hybrid learning and hybrid programs, and online learning programs.

[B]Terminology, Getting it Straight

A brick-and-mortar school is one that is traditional, where students and teachers are in a physical classroom, learning in that classroom is based on a set schedule, and 100% of learning is done in a face-to-face (teacher-to-students) format (Allen & Seaman, 2010). Virtual schools are typically supplemental (i.e., not full-time) entities, meaning the K–12 students who take online classes from virtual schools are also enrolled in a brick-and-mortar school. In most instances, these students spend the majority of their time in a traditional classroom and take one or two online courses from the virtual school—often because these courses are not available at their school, they conflict with the timetable for their other courses, or the students have not had successful learning experiences in these courses or subject areas in their traditional classroom environments. Further, in many instances virtual schools do not grant credit to students but forward students’ results on to the students’ brick-and-mortar schools, and then these schools grant the students credit on their permanent records. Essentially, the virtual and traditional schools work together to educate students. In contrast, cyber schools typically run full-time programs, offering students 100% of their coursework online (Barbour, 2009a).

Blended and hybrid are two terms that are thought by many to be synonymous. For example, Allen and Seaman (2010) combine the words to form one classification: “. . . 30–79%—Blended/Hybrid—course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has some face-to-face meetings” (p. 4). We, however, think these terms need to be differentiated in the following ways. Hybrid refers to cyber schools that might have a face-to-face component. In hybrid models, online learning occurs separately from face-to-face learning. An example of a hybrid school would be Odyssey Charter School in Las Vegas, Nevada. At Odyssey, students are physically present in the school for only

one morning or one afternoon a week to take one course in a face-to-face fashion; then they meet with their online teachers. Odyssey students take all their other courses online (Barbour & Plough, 2009). However, in hybrid schools, all of the students' courses come from a single entity or school.

Blended models take place when students attend a brick-and-mortar school and are present in classrooms where they take face-to-face courses from teachers and may sometimes meet one-on-one with teachers. They also engage in online learning components while they are in the classrooms. An example of this would be Voise Academy in Chicago. At Voise, the students are in face-to-face courses that are enhanced by online curriculum elements. Teachers at this school are facilitators of the students' learning and are in charge of providing one-on-one instruction as needed (Sloan & Mackey, 2009). Blended learning could be considered Allen and Seaman's (2010) web-facilitated classification, for which 1% to 29% of the course uses technology on the Internet to enhance what is done in the face-to-face learning environment (although Allen and Seaman's specific percentages do not apply to other blended models). In some cases, the online component is where the syllabus and course schedule are posted and where assignments are submitted into a face-to-face course or learning management system.

The terms hybrid and blended can also be used to describe programs, so a hybrid program is one that offers a buffet of face-to-face and online courses that are separate from one another. Blended programs offer students a face-to-face traditional classroom with online learning opportunities during that classroom time. Both blended and hybrid courses offer online course content, online instruction, digital/adaptive curricula or software, and course management systems.

[B]Defining Models of K–12 Online Learning Programs

There are various models that further distinguish existing K–12 online learning programs. Table 4.1 describes and provides examples of each of these models.

[TITLE]Table 4.1. Categories of K–12 online learning programs (Table 4.1 is adapted from Watson, Winograd, and Kalmon's (2004) five categories of virtual schools, p. 427).

Type of virtual school	Description	Examples
Statewide supplemental programs	Students take individual courses from supplemental programs while attending a physical school or cyber school within the state for their main coursework. These programs are authorized by the state and overseen by state education governing agencies.	Michigan Virtual School, Idaho Digital Learning Academy
Single-district schools	These schools provide an alternative to the traditional face-to-face school environment and are offered by individual districts for students	Riverside (CA), Broward (FL), Plano (TX), Los Angeles, JeffCo (CO),

	within that district who need individualized programs. Alternative schools offer online courses, face-to-face courses, one-on-one tutoring, and counseling as needed. These schools are typically operated by autonomous districts and are generally not tracked by state agencies.	WOLF (NV)
Multi-district schools	These schools are operated within individual school districts but enroll students from other school districts within the state. This represents the largest growth sector in K–12 online learning. Multi-district schools offer online and hybrid courses.	Oregon Connections Academy, Insight School of Washington
Cyber charters	These schools are chartered within a single district but can draw students from across the state. In many cases, they are connected in some way to commercial curriculum providers. Cyber charters offer fully online and hybrid courses.	Georgia Virtual Academy, Minnesota Virtual High School
Consortium	These are supplemental programs that can be statewide, national, or global.	Virtual High School Global Consortium, Wisconsin eSchool Network, Oregon Virtual Education Center (ORVED)
Post-secondary	These programs are run by universities and colleges and offer both supplemental and full-time options for K–12 students. They typically offer their services nationally. Most courses are fully online; some may be hybrid.	University of Nebraska Independent Study High School, Brigham Young University—Independent Study

It is important to note that there are exceptions to each of these types of K–12 online learning programs. There are a few main continuums that are used to classify K–12 online learning programs that are outlined well in the annual *Keeping Pace with K–12 Online Learning* reports (Watson et al., 2010).

Comprehensiveness is a term used to distinguish whether a school or district offers supplemental and/or full-time online options to students. If the school offers supplemental programs, then typically, the students who take its courses are home schooled and/or attending a brick-and-mortar school. States require K–12 online learning programs that offer students full-time options to abide by the same accountability standards as their brick-and-mortar counterparts.

Another term used to distinguish among K–12 online learning programs is “reach,” which helps to understand where the school operates (i.e., in a school, school district, various school districts, or state). Some programs even venture to offer their programs nationally and internationally (Watson, et al., 2010). Whether the course is delivered in real time or not (i.e., synchronous vs. asynchronous) is another distinction that is typically made when considering K–12 online learning programs. For instance, some programs might require a frequent same-time chat or web conference where all students and the teacher meet in a virtual class, chat, or web conference room to discuss content. Other programs might not be able to offer same-/real-time interactions since students and teachers might have conflicting schedules, so teachers’ lectures and students’ discussions might be uploaded and observed by students at their convenience.

Some programs offer blended or hybrid options on a continuum that spans from 100% online to 100% face-to-face. In addition to these terms, other continuums offer some definitions for particular K–12 online learning programs. For example, what roles teachers play form important distinctions: do teachers lead instruction, support learning, or are they involved in the students’ learning at all? Along similar lines, students’ roles make distinctions: Are students being provided only teacher-driven learning? Is students’ learning being guided to any extent by the teacher? Or are students learning independently? Another continuum would be to look at the levels of student support offered by the program: are students offered little-to-no support, support via a mentor at a school, or support at home and at school?

[A]State of K–12 Online Learning in the United States

[B]The Past

U.S. K–12 distance education has undergone continual change. K–12 online learning originated with correspondence (via U.S. mail on paper) distance education courses offered by the University of Chicago beginning in 1981 (Greenway & Vanourek, 2006). From correspondence mail to radio to television to computers and the Internet, emerging technological innovations have changed the education landscape (Clark, 2007). Laurel Springs Preparatory High School started in 1991, and by 1994, it was recognized as one of the first schools in the United States to offer a comprehensive online curriculum (Laurel Springs School, 2011).

By the mid- to late 1990s, statewide programs had begun. Due to Utah’s school shortage and ever-expanding K–12 population, Governor Michael Levitt established Utah’s Electronic High School (EHS) (Center for Educational Leadership and Technology, 2008). The first U.S. statewide virtual high school, EHS offers a curriculum that supplements traditional brick-and-mortar coursework and is asynchronous, allowing for independent study and self-pacing. EHS students also have an open-entry/open-exit option, allowing them to start and end a course whenever they want. They are not tied to an academic calendar.

Florida Virtual School (FLVS) began as Florida High School in 1997 as a joint effort between the Orange and Alachua county school districts with an allocation of \$200,000

from the state legislature (Friend & Johnston, 2005). Initially, and to this day, FLVS’s mission is to serve students statewide. As of 1999, FLVS was “funded through a legislative line item appropriation to the State Department of Education” (Clark, 2001, p. 5). However, in 2001 FLVS became its own school district and is currently funded using the same full-time equivalency formula used for Florida’s brick-and-mortar schools. Under this model, money is allocated to school districts (including FLVS) based on where students choose to enroll. During its first year of operation, FLVS enrolled 77 students. In 2011–2012, FLVS’s enrollment was 314, 593 (www.flvs.net/areas/aboutus/Documents/2013_FLVS_Policy_Brief.pdf).

The Virtual High School (VHS) Global Consortium was created as the Concord Virtual School in Massachusetts in fall 1997 by way of a five-year, \$7.4 million federal grant called Stars Initiative (Pape, Adams, & Ribeiro, 2005). The Concord VS was administered by the Hudson Public Schools and the Concord Consortium (Clark, 2001). The VHS Global Consortium is a cooperative high school that develops its own courses internally. The VHS Consortium includes schools that become affiliates to create and offer courses for VHS; affiliate schools pay a fee for their participation in the consortium. Affiliates cover their participation fees by charging students enrollment fees. More than 575 schools are members of the VHS Global Consortium with students from 30+ states and 20+ countries. Cooperating schools may choose from over 140 online courses furnished by the consortium (Pape, 2009). The VHS Consortium’s growth rate has been increasing from 10% to 25% per year, and, as of 2010, it had 12,893 enrollments internationally (Watson, et al., 2010). VHS, FLVS and Utah’s EHS positioned themselves as the early pioneers of K–12 online learning (Clark, 2007).

[B]The Present

The *Keeping Pace with K–12 Online Learning* report, published annually, offers an overview of K–12 virtual schooling in the United States. According to the 2013 report, all 50 states and the District of Columbia offer K–12 students some form of online learning. Twenty-six of those states have a state-led online learning initiative or state virtual school. Thirty states in addition to the District of Columbia have a full-time online school option for their K–12 students. One of the fastest growing trends in the K–12 online learning arena is the development of K–12 online learning programs at the individual district level; many of these district-level programs are combining the best of the brick-and-mortar classrooms and online learning to offer their students blended and hybrid opportunities.

A look at each state provides more details regarding K–12 online learning (See Table 4.2).

[TITLE]Table 4.2. Supplemental and full-time K–12 online learning activities by state (adapted from the 2010 edition of *Keeping Pace with K–12 Online Learning*)

State	K–12 Online Learning Programs Offered	
	Supplemental	Full-time

	9–12	6–8	K–5	9–12	6–8	K–5
Alabama	Most	Some	None or few	None or few	None or few	None or few
Alaska	Some	Some	None or few	Some	Some	Some
Arizona	Most	Some	Some	All	All	All
Arkansas	Some	None or few	None or few	Some	Some	None or few
California	Some	Some	None or few	Most	Most	Most
Colorado	Some	None or few	None or few	All	All	All
Connecticut	Some	None or few				
Delaware	None or few					
Florida	All	All	All	All	All	All
Georgia	Most	Some	None or few	All	All	All
Hawaii	Most	Some	None or few	None or few	None or few	None or few
Idaho	Most	Some	None or few	All	All	All
Illinois	Some	None or few				
Indiana	Some	None or few	None or few	All	All	All
Iowa	Some	None or few	None or few	Some	Some	Some
Kansas	Most	Most	Some	Most	Most	Most

Kentucky	Some	None or few				
Louisiana	Most	Some	None or few	Most	Most	Most
Maine	Some	None or few				
Maryland	Some	None or few				
Massachusetts	Some	Some	None or few	Some	Some	Some
Michigan	Most	Some	None or few	Most	Some	Some
Minnesota	All	All	Some	All	All	All
Mississippi	Some	None or few				
Missouri	Some	None or few				
Montana	Most	Some	None or few	None or few	None or few	None or few
Nebraska	Some	Some	None or few	None or few	None or few	None or few
Nevada	Most	None or few	None or few	All	All	All
New Hampshire	Most	Some	None or few	Some	Some	None or few
New Jersey	Some	None or few				
New Mexico	Some	Some	None or few	Some	Some	Some
New York	None or	None or	Some	None or	None or	None or

	few	few		few	few	few
North Carolina	Most	Some	None or few	None or few	None or few	None or few
North Dakota	Some	Some	None or few	None or few	None or few	None or few
Ohio	Most	Some	None or few	All	All	All
Oklahoma	Most	None or few	None or few	All	All	All
Oregon	Some	Some	None or few	Most	Most	Most
Pennsylvania	Some	None or few	None or few	All	All	All
Rhode Island	Some	None or few				
South Carolina	Most	None or few	None or few	All	All	All
South Dakota	Most	Some	None or few	None or few	None or few	None or few
Tennessee	None or few	None or few	None or few	None or few	Some	Some
Texas	Some	Some	None or few	Most	Most	Some
Utah	Most	Some	Some	All	All	All
Vermont	Some	Some	None or few	None or few	None or few	None or few
Virginia	Most	Most	Some	None or few	None or few	None or few
Washington	Most	Most	Some	All	All	All
West Virginia	Most	Some	None or few	None or few	None or few	None or few

Wisconsin	Most	Some	None or few	All	All	All
Wyoming	Most	Some	None or few	All	All	All

A number of states have laws requiring students to take an online course before they graduate from high school. For example, Michigan passed legislation in 2006 requiring high school students to have “an online learning experience” before graduating from high school (Watson et al., 2010). According to the Alabama State Department of Education’s 2008 mandate, beginning with the 2009–2010 ninth grade student body, all high school students must complete at least one course that is online and/or enhanced by technology in a core or elective track (Cowan, 2009). Further, in 2009, “Graduate New Mexico” was enacted, requiring students to take an advanced placement, distance education, or dual enrollment course to graduate from high school (Watson et al., 2010). Florida mandated that all districts must provide their students with K–12 online learning opportunities, either through their own, homegrown programs or via contract with other state-approved online learning providers.

Additional measures have been enacted to support the growth of K–12 online learning in a number of states. For example, Connecticut passed a law that allows teachers to be certified in any state. That same law also required districts with an 8% or higher dropout rate to create an online credit recovery program to help students catch up and earn enough credits to graduate. Idaho’s State Board of Education adopted Standards for Online Teachers. In Wisconsin, teachers have to complete a minimum of 30 hours of professional development before they can teach online. Alabama has started to allow students to earn credits to be considered toward graduation based on mastery rather than accumulating seat time (Watson et al., 2010).

Decreasing budgets and lack of qualified teachers have put considerable pressure on education in general and have prompted more people to think in terms of K–12 online learning. While there is continuous growth of K–12 online learning in the United States, growth is uneven across the states due to various issues. Outdated policies in some states have put a halt to the access and equity of K–12 online learning, including the irrelevant use of seat time measurement; the forced capping of enrollment due to the structure of schools; plus the geographic boundaries from one school, school district, or state to another, and the list goes on.

[A]State of K–12 Online Learning in the Rest of North America

While most of the media attention—and even most of the literature (Barbour, 2009a)—have focused upon K–12 online learning activities in the United States, in many other countries around the world, the provision of K–12 distance education has evolved into extensive online programs for the same number of years as we have had them in the

United States. As we considered the two other North American countries, we saw that K–12 online learning in Canada is just as old with similar levels of activity as found in the United States. Mexico, considered to be the economically weakest of the three nations, has more extensive measures in place to promote K–12 online learning than those in the United States.

[B]Canada

Similar to other geographically large countries with comparatively sparse populations, Canada has a long history of supporting K–12 distance education. This began with a correspondence school in British Columbia in 1919, with 86 students (13 of whom were living in lighthouses along the coast) and eventually grew to serve more than 600 students within the first decade (Dunae, 2006). In 1993, British Columbia again led the country with the introduction of two K–12 online learning programs, *New Directions in Distance Learning* and the *EBUS Academy*, (Dallas, 1999). Other provinces, such as Manitoba, Ontario, Alberta, and Newfoundland and Labrador, followed suit with district-based online programs of their own (Barker & Wendel, 2001; Barker, Wendel & Richmond, 1999; Haughey & Fenwich, 1996; Stevens, 1997).

Shortly thereafter, Wynne (1997) conducted a review of K–12 online learning across Canada and found that there were few programs outside British Columbia and Alberta. From this early introduction and initially slow growth, K–12 online learning throughout Canada has grown steadily over the past two decades. For example, the Canadian Teachers Federation (2000) estimated that there were approximately 25,000 students enrolled in K–12 online courses. Further, in a study of how schools were using information and communication technologies in Canadian schools, Plante and Beattie (2004) found that almost 30% of all schools and almost 40% of secondary schools in the country were using the Internet for online learning.

In the second annual *State of the Nation: K–12 Online Learning in Canada* report, Barbour (2009b) reported that all 13 provinces and territories had K–12 distance education activity, with British Columbia having the highest number and percentage of participating students and Prince Edward Island having the fewest. The growth focused on providing opportunities to students living in rural jurisdictions. For example, the Canadian Council on Learning (2009) reported that more rural schools than urban schools had students participate in online courses, often in a supplemental manner when courses could not be offered due to limited resources or teachers. In fact, K–12 distance education had historically been viewed as a substitute for face-to-face learning when opportunities were not available to students in other formats (i.e., the belief that face-to-face was the preferred delivery model when it was available)—although that perception is beginning to change as K–12 online learning continues to grow in numbers and in geographic reach.

Barbour (2013), in the most recent annual *State of the Nation: K–12 Online Learning in Canada* report, estimated approximately 245,000 students (or approximately 5% of the total K–12 student population) were enrolled in K–12 distance education programs in Canada, which is similar to the proportion of K–12 students engaged in online learning in the United States. A closer look at the development of K–12 online learning in three of

the Canadian provinces, British Columbia, Alberta, and Newfoundland and Labrador, provides an interesting examination of the many different ways these programs have developed.

In British Columbia, the first Canadian province to offer K–12 online learning opportunities, distance education developed in three distinct phases: (1) the correspondence education operated by the Ministry of Education from 1919 until the 1980s, (2) a more decentralized model using regional distance education schools until the mid-1990s, and then (3) the creation of numerous district-based programs heavily regulated by the Ministry of Education for the past decade (Winkelmans, Anderson & Barbour, 2010). British Columbia is the most heavily regulated jurisdiction in Canada with legislation creating a quantitative and qualitative audit system to ensure high-quality learning opportunities for K–12 students. Also of note is that the Ministry of Education has created a detailed formula ensuring that the per student funding follows the student, with brick-and-mortar schools receiving some compensation to allow for local support of those students enrolled in distance education opportunities. Three years ago, British Columbia had the highest proportion of students enrolled in K–12 online learning programs, with 78,650 students enrolled in one or more courses during the 2011–2012 school year or 12% of all students (Barbour, 2013).

K–12 online learning in Alberta, on the other hand, developed from a series of district-based programs beginning with a strong, province-wide program that maintained substantial student enrollments. In addition to the differences between the nature of programs that developed in Alberta and British Columbia, even more differences can be noted in how the two provinces regulate K–12 distance education. Unlike British Columbia—where the Ministry of Education had direct involvement, followed by a “hands-on” approach, and then extensive regulations—Alberta has taken an almost completely “hands off” approach. In Alberta’s 2009 annual *Guide to Education*, the Ministry advises school districts to consider the following:

[BQ]

how student attendance is to be defined; the role of parents in instruction, assessment and supervision of student work; staffing levels; time frames for student access to the instructional expertise of teachers; student evaluation practices; requirements for program access by students living outside Alberta; program decisions; e .g., self-paced or teacher controlled, synchronous or asynchronous; how to deliver all outcomes of Alberta programs of study; provision for writing achievement tests and diploma examinations; program and teacher evaluation; how to provide alternative forms of program delivery for non-resident students who are experiencing difficulty in the online environment. (Government of Alberta, 2009, p. 65)

[/BQ]

Interestingly, one year later, Alberta’s Ministry released the *Inspiring Action on Education* discussion paper, which calls for an education system where teachers can

teach in “face-to-face, online, and other non-traditional environments” (Government of Alberta, 2010, p. 24). This vision would essentially create a school system where students, teachers, and administrators are all comfortable with education being delivered with or without technology through a variety of delivery methods.

In contrast with the examples from British Columbia and Alberta, where programs developed primarily into district-based initiatives, Newfoundland and Labrador began with limited, district-based programs, and a combination of the two systems evolved into a single, province-wide virtual school (Barbour, 2005). First, the province started using telematic or audiographic systems that used bridging technology to provide conference calling facilities, including a device that reproduced writing from the teacher’s tablet to computer screens linked to the audio-graphics network (Brown, Sheppard, & Stevens, 2000). Less than a decade later, several district-based online learning programs developed (e.g., East–West Project, Vista School District Digital Intranet, Centre for Advanced Placement Education) providing a model for additional online learning programs. By 2000, the lessons learned from the initial province-wide telematics system, along with the district-based online learning programs, were combined to create a single, province-wide Centre for Distance Learning and Innovation (Sparkes & Williams, 2000).

These three provinces demonstrate the unique nature of the development of K–12 online learning in Canada. Some jurisdictions had long histories with K–12 distance education prior to the development of online learning programs, while others started more recently. Further, some provinces and territories have single or strong province-wide programs, while other jurisdictions have almost exclusively district-based programs. The variety of approaches is largely due to the provincial control over education, as opposed to a system of education that exerts a more centralized or federally controlled education system, such as the one found in Mexico.

[B]Mexico

Mexico is among those countries making giant strides to provide K–12 online learning opportunities. Due to space issues in high schools and colleges, Mexico will have to leverage education using online learning (Barbour, Brown, et al., 2011. According to this 2011 report published by iNACOL, *Online and Blended Learning: A Survey of Policy and Practice of K–12 Schools Around the World*, Mexico has developed government-funded online or blended programs for middle school and high school students. In fact, the report’s coauthors report that some form of online learning is available to all students, and blended learning is available to some. An estimated 200,000 students, about 10% of Mexico’s middle school and high school student population, attended online schools in 2011. The students came from rural, suburban, and urban areas and from small and large schools. These online learning opportunities continue to provide students additional course options that they might not have access to due to residence in rural locations or these types of courses not being available at their local, traditional schools. Courses are also offered to homebound students on medical leave of absence or those who have special needs. In addition, for migrant workers who need to support their families while away from home and/or who travel often, online learning is ideal. In addition, online learning helps to challenge gifted students, those who want to prepare for colleges using

AP courses or college-preparatory courses, and those who want to begin taking college-level courses.

As of 2011, Mexico had at least nine distance education high schools (Barbour, Brown, et al., 2011). These programs, which developed from former *telesecundaria* or television-based programs, are generally operated by universities and focus on rural areas that are unable to support high school teachers (Barbour, 2009a). The main focus of these distance education programs is to help adults finish high school. As Internet access is not available in many portions of the country, particularly in rural areas, many distance education schools still use educational radio, satellite delivery, DVDs, online media, mobile phones, and correspondence coursework via the postal service to facilitate learning. In 2003, Mexico introduced the Enciclomedia program, which digitized K–12 academic content and provided students with online access and CD-access to learning in every school, library, and community technology center (Secretaría de Educación Básica, 2010). Enciclomedia offers technical support, audiovisual representations of curriculum for students, and tutorials that show teachers how to incorporate the Enciclomedia resource into their classes. The teachers' materials are broken down by discipline, in addition to an educational planning series that offers 14 programs. The Latinoamerican Institute for Educational Communication, the Directorate General of Educational Television, and the Directorate General of Educational Materials helped construct these programs. For those interested in creating a resource like Enciclomedia, its site offers a section where the coordinators and founders of this resource discuss the program's purpose and creation along with an overview of how Enciclomedia is positively changing teaching and learning in Mexico (www.sep.gob.mx/en/sep_en/Enciclomedia_program).

By 2004, Mexico mandated that all preservice teachers be trained to teach more effectively by integrating digital content into their curricula (Dawley, 2010). Using Enciclomedia student resources and practical examples, teachers find digital content at their fingertips. In addition, every new teacher was provided a laptop by 2005 (Gillis, Patrick, Reed, Revenaugh, & Watson, 2009). Mexico's universities and colleges are responsible for training K–12 teachers to prepare for online learning and technology integration, and teachers of online courses have no licensing requirements. Mexico is struggling with a lack of policy or policy barriers in terms of access limitations for students who want to take online courses. Funding for professional development and teacher training also is lacking. Despite these roadblocks, Mexico's online learning growth of approximately 15% per year demonstrates this country's robust emergence into the K–12 online learning arena (Barbour, 2011).

[A]State of K–12 Online Learning in the Rest of the World

In 2006, the International Association for K–12 Online Learning (iNACOL) conducted a worldwide survey of approximately 30 departments of education and received responses from 15 countries. In the introduction to its findings, iNACOL wrote, "Research has been done on several virtual schools in North America; however, little information is available about current K–12 e-learning initiatives across the world" (Powell & Patrick, 2006, p. 1).

While the situation has changed to some extent in recent years, detailed information on K–12 online learning programs outside North America are lacking. However, Barbour (2009a) noted that “the organization of online learning programs into single entities or schools that provide supplemental or full-time online studies [was] largely a North American phenomenon” (p. 10) which is still largely true.

Based on the 15 responses iNACOL received from its 2006 survey, the levels and scope of virtual schooling outside North America varied significantly. For example, while fewer than 1% of students in China took an online course, the Chinese Ministry of Education planned to reach 100 million more students through online learning over the next 10 years (Barbour, 2010b). India has a similar 10-year goal of universal access to K–12 education, which would require the construction of 200,000 additional schools unless the government focuses its rural endeavors toward online learning. Other countries have chosen a more blended approach, such as Iran, where online courses are developed free of charge and classroom-based teachers are able to use that content as a supplement to their own instruction and curriculum resources. In the United Kingdom, K–12 online learning has been used as a way to extend the traditional classroom to provide students and parents access to curricular materials, instruction, and even student information systems beyond the confines of the regular school day (Harris, 2005).

K–12 online learning activities have been described in several other countries, including Australia, Denmark, France, Iceland and Sweden (Harris, 2005); Hong Kong, Japan, Kazakhstan, Nepal, New Zealand, Singapore, Tanzania, Turkey and Zimbabwe (Powell & Patrick, 2006); and Finland and South Korea (Barbour, 2010b). The following sections describe the development and situations of K–12 online learning activities in five of these countries: Australia, New Zealand, Singapore, South Korea, and Turkey.

[B]Australia

The use of distance education at all K–12 levels is not new across Australia. More than 60 years ago, the first School of the Air was established, using educational radio as a way to provide opportunities to rural students—and there were still 20 of these distance education programs operating in the late 1990s (Moore & Kearsley, 1996). Virtual schooling has also developed extensively in recent years. Powell and Patrick (2006) describe the development of the Country’s Areas Program (CAP), which provides online learning opportunities to rural students in the New South Wales region, reporting that the “CAP works with the state’s Distance Education Centers to share resources and lessons. The Distance Education Centers provide video satellite feeds to students to provide synchronous collaborations amongst students and their teachers to create a blended learning environment” (para. 6).

As well as the CAP, New South Wales offers additional K–12 online learning. Harris (2008) described the Northern Beaches Christian School (NBCS), which offers online learning in partnership with the Sydney Centre for Innovation in Learning. In 2001, the NBCS first developed a school portal and course management system to allow classroom-based teachers the opportunity to use online resources and instruction in their face-to-face teaching. This was followed in 2006 by the development and delivery of

completely online courses, with an initial enrollment of 15 students from four schools and grew to more than 200 students in 40 schools only two years later (Harris, 2008).

Beyond the online programs available in New South Wales, Barbour (2010b) reported the existence of the Virtual School for the Gifted and the Virtual Schooling Service in Australia. Barbour's conference paper's focus on programs in New South Wales may have been a reflection of the specific individuals who completed the iNACOL survey and the limited literature in K–12 online learning—particularly given Australia's long history with the Schools of the Air and the fact that telematics had been used at the K–12 level since the late 1970s or early 1980s (Oliver & Reeves, 1994).

[B]New Zealand

The use of distance learning throughout K–12 education began in New Zealand around 1922, with the introduction of the Correspondence School (Barbour & Wenmoth, 2013). While the Correspondence School continues to offer K–12 distance education opportunities using the traditional postal mail system, beginning in 1994—with the CANTAtch project—the use of Internet-based distance education has increased steadily. This increasing development of K–12 virtual learning in New Zealand schools has focused predominantly on regional and rural settings, as a means of providing access to curricula that schools are unable to offer due to small student enrollment and difficulty in attracting and retaining teachers in specialized subject areas (Wenmoth, 1996).

In 2002, the first regional network or cluster in New Zealand began connecting its classes using video conferencing. The following year, the Virtual Learning Network (VLN)—essentially a national virtual school—was established. The primary focus of the VLN was to broker a model for sharing video-conferencing courses among K–12 schools and these regional clusters (Barbour, 2011). In 2004 the Ministry of Education published a handbook to assist schools in forming virtual learning clusters. *Learning Communities Online: A Handbook for Schools (LCO Handbook)* contained a matrix to guide development from initial conception to implementation. The matrix included areas such as relationships and communication, logistical coordination, student needs, staffing and professional development, technical coordination, learning resources, and others focused on how to introduce virtual learning into the school and establish the administrative supports that were needed.

The number of clusters and schools involved with the VLN has grown significantly in recent years. In addition, schools in urban areas have been taking advantage of opportunities for collaboration, including curriculum and resource sharing with the help of Ultra Fast Broadband. In 2009, more than 20 of these clusters existed (Compton, Davis & Mackey, 2009), representing 1401 student enrollments from 252 schools in 212 different courses taught by 154 distance or e-teachers (Roberts, 2009). The *LCO Handbook* has been extensively revised with an additional dimension added to the matrix to address issues of sustainability and maturity. While the first edition of the handbook focused on assisting schools with becoming involved with the VLN and the initial creation of regional clusters, the updated handbook places a greater emphasis on strategies and tools that participating schools and clusters can use to sustain and expand

their involvement with the VLN. The *Learning Communities Online Handbook* was made available in February 2011, by CORE Education Ltd. and the New Zealand Ministry of Education (www.vln.school.nz). (For additional information on New Zealand's technology in education programs, see www.minedu.govt.nz/theministry/educationinitiatives/ufbinschools.aspx & www.med.govt.nz/sectors-industries/technology-communication/fast-broadband/education)

[B]Singapore

According to Powell and Patrick (2006) K–12 schools have the ability to determine the method of used to integrate information technology. In Singapore, the national goal mandated that all secondary schools (i.e., grades 7 to 10) and junior colleges (i.e., grades 11 and 12) have a course management system by the end of 2006. As of May 2006, all secondary schools and junior colleges, along with 85% of primary schools (Grades one to six) were using course management systems. While this allowed for almost all K–12 students throughout the country to be able to take an online learning course, Powell and Patrick indicated that the blended approach is often used, combining a mixture of face-to-face instruction with online learning in the classroom environment.

The pervasive infrastructure in place that allows K–12 online learning has also enabled the system to shut down and use online learning as a part of its pandemic drills. Powell and Patrick describe this as follows:

[BQ]

a number of schools in Singapore have adopted e-Learning week, where students do not attend school but stay at home working on lessons and assignments delivered through the learning management system. During this week, teachers facilitate the learning and provide feedback via email and other electronic means. (¶ 85)

[/BQ]

These e-learning weeks have continued to grow in size, with more schools, teachers, and students participating each year.

The growth of K–12 online learning and participation in the annual e-learning weeks has been supported by the national teacher education program, which has provided preservice and in-service teachers with initial training and ongoing professional development into online course design and online pedagogy. In 2006, the government provided \$500 million to fund research designed to support “Singapore’s long-term vision of growing into a global interactive and digital media capital that will fully leverage the Web 2.0 space” (Koh & Lee, 2008, p. 89). As Powell (2010) reported, the Ministry of Education in Singapore wanted “to take education into the next generation of technologies and pedagogical practices by prototyping and studying educational gaming, virtual worlds for

learning such as *Second Life*” (p. 77). These measures were designed to place Singapore at the forefront of digital education worldwide.

[B]South Korea

From 1996 to 2011, the South Korea central government implemented three *Master Plans* related to the use of information and communications technologies (ICT) in education. From 1996 to 2000, Master Plan I put computers and Internet access in Korean classrooms and provided initial ICT literacy. Master Plan II, from 2001 to 2005, first saw online course content development and distribution, along with teacher training. This was followed by the creation or reorganization of specific K–12 e-learning programs (e.g., Cyber Home Learning System [CHLS] and EBS video streaming). From 2006 to 2011, Master Plan III focused on extending these programs, as well as exploring mobile learning research and development opportunities (Korean Education and Research Information Service, 2008).

One of the main driving forces behind the growth of K–12 online learning and the CHLS has been student aspirations for a post-secondary education. More than 80% of Korean students attend colleges or universities (Song & Kim, 2009). Competition for entrance into the best-ranked colleges and universities requires that parents purchase additional tutoring beyond formal schooling; in some instances the cost of this additional private tutoring can be the single biggest household expense for many families. The CHLS provides supplemental learning opportunities to reduce the cost of this private tutoring and eliminate the gap between regions and classes. The CHLS has grown significantly. For example, in 2005 there were approximately 750,000 students who had registered with the CHLS. By 2008 the government-run CHLS was being used by 3.09 million students, with an 86% increase in the number of classes and a 100% increase in the number of students per class from the previous year (Korean Education and Research Information Service, 2009). Approximately 10,000 teachers were working as cyber tutors as of 2008, serving students in pedagogical, administrative, social, and technical roles (Bae, Han, Lee, & Lee, 2008). One of the successes of the CHLS programs is that over one third of registered users stopped or planned to stop paying to use the private tutor system. Even more recently, Korea Education and Research Information Service (2011) found that there were over four million users of the CHLS, with more than 200,000 of those users logging into the system each day.

[B]Turkey

Similar to South Korea, the need for K–12 online learning in Turkey is being driven by the state’s mandated testing. Students in Grades six, seven, and eight are required to complete statewide standardized exams in all of their core subject areas. Upon graduating from primary school, it is the students’ performances on these exams that determine their secondary school placements. Such high-stakes testing has precipitated the growth of a private tutoring industry, along with several government initiatives designed to provide similar opportunities to low-income families unable to afford private tutorials (Sakar & Ozturk, 2011). Beyond the provision of online tutoring to K–12 students, several K–12

distance education opportunities have been offered in Turkey, including for vocational education.

Following the success of similar programs in higher education, along with a successful K–12 instructional television program, in 1992, Turkey’s Ministry of National Education established an open high school. Based on a correspondence education model (i.e., instructional packages and assessments sent via postal mail), the open high school program began with almost 45,000 students in its first year of operation (Demiray & Adiyaman, 2002). Within five years, the open high school’s enrollment had doubled to 90,000 students. By the 2008–2009 school year, about 10 years later, the open school’s enrollment was approximately 1.3 million.

According to Powell and Patrick (2006), a new initiative known as the “Online Big Project” began in 2006. A collaboration between the government and a series of non-governmental organizations and private businesses, the goal of the Online Big Project was to provide the entire (K-8) elementary school curriculum in an online format, to be followed by the digitization of the entire secondary school curriculum. At the time, it was expected that the elementary school pilot would service more than 200,000 students during their initial pilot year and more than 11,000,000 within three years of operation.

[A]Summary

Our goal for this chapter was to explore the state of K–12 online learning in the United States, North America, and around the world. K–12 online learning is the umbrella term used to describe all instances of students who are learning using the Internet.

From 1891’s correspondence courses to today’s fully online, hybrid, and blended learning opportunities, K–12 online learning in the United States is continuing to grow. New statewide policies are making K–12 online learning an integral part of the education system. Trends such as home-grown district level programs have provided new challenges for educators in terms of what model works best and for whom. With 49 out of 50 states and the District of Columbia offering online learning opportunities to K–12 populations around the country, this sector of education is continuing to see steady growth.

Just over the border to the North and the South, Canada and Mexico have established online learning opportunities that reach their K–12 populations. While Mexico is providing laptops for every teacher and ensuring they can integrate digital content into their curricula, Canada is continuing its growth in online learning by way of district-level and province-wide online programs that are home-grown within provinces. Because Canada’s provinces have much more control than U.S. states do, examples of how K–12 online learning has entered the education system in Canada are numerous. In Mexico, on the other hand, the government has a centralized system providing the same opportunities to all students within the country. Both countries are expecting exponential growth in K–12 online learning in the coming years.

Beyond North America, K–12 online learning is booming. Australia reaches students online who have remote access to traditional education opportunities. New Zealand continues to offer correspondence coursework to its K–12 population and has seen a rise in the use of the Internet for content delivery, particularly with the use of video conferencing. Singapore’s government invested funds for the continual professional development of its K–12 teachers, enables it to harness online pedagogical practices for the overall betterment of the country’s education system. South Korea, in hopes to alleviate extensive tutoring fees incurred by families, offers supplemental online learning to K–12 students. And Turkey is building an online learning infrastructure with its Online Big Project initiative with goals reverberating across the entire country.

So what does this chapter say about K–12 online learning? The steady, often exponential growth of this educational opportunity has caused excitement and some growing pains, especially for programs that were started in the early to mid-1990s. Now that some explicit models have been established, programs have effective guidelines to follow, as well as contacts and examples to seek out for advice. Advocates for K–12 online learning are continuing to advocate for policy changes that support effective programs, and as programs grow, practitioners look for practical research that will advance the K–12 online learning field.

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