Chapter 1

What Is Blended Learning?

You can't go more than a few steps in education circles these days without hearing about blended learning. It's at the top of the list of trending topics related to changing education. Thanks in part to Sal Khan, founder of the Khan Academy — which serves more than ten million students per month in at least two hundred countries with its massive library of instructional videos and interactive exercises — the idea of blended learning is becoming commonplace.[1] But before the Khan Academy, and even before the term "blended learning" emerged, millions of students were experiencing the blend of online learning into their schools. Scholastic's READ 180 reading intervention program, which initially loaded on school computers through CD-ROMs and later migrated online, has been in classrooms since 1998, and today serves roughly 1.3 million students in over forty thousand classrooms.[2] Although the exact extent of blended learning at the K–12 level in America is unknown, experts at the Evergreen Education Group estimate that more than 75 percent of districts offer some online or blended options.[3]

But any fair look at education technology in U.S. K–12 schools must acknowledge that the nation has spent over $100 billion on computers in the past few

decades with very little to show for it in the way of results.[4] So why all the hype about blended learning? What makes it any different from the long history of computers and technology in schools?

ONLINE LEARNING'S UPWARD MARCH

Blended learning has its roots in online learning. Like all disruptive innovations—from Amazon.com to TurboTax—online learning is improving steadily and predictably, as it seeks to serve more demanding users in tougher situations.

This pattern of disruptive innovations is critical to understanding what's ahead for online learning. When it emerged, online learning predictably had the reputation of being a low-end, second-string alternative to the traditional face-to-face classroom. Among the forty thousand or so K–12 students who were taking at least one online course in 2000, most used online coursework as a last-ditch effort to recover credits in time for graduation, avoid dropping out of school, or study independently in a homeschool or other distance-learning setting.[5] Online learning had little appeal for mainstream students.

But true to the pattern of disruptive innovations, online learning has marched steadily upward to reach a broader range of students and has even begun to replace traditional instruction in certain instances. In some schools, online foreign language courses were the first a viable substitute for attending a traditional face-to-face class. High Tech High, a charter school network based in San Diego, California, began using Rosetta Stone's foreign language program, for example, because of the software's reputation for helping students master languages faster than a lecture-style classroom can. "Rosetta Stone has spent millions in research and development, and it has a very clever way of interacting with its users," said Larry Rosenstock, CEO of High Tech High. He believes students can learn more in a year with Rosetta Stone than with even the best face-to-face teachers.[6]

One of the most significant ways that online learning improved was by leaning more heavily on in-person, brick-and-mortar experiences to provide support and scaffolding for students learning online. In the early days, online programs were largely indifferent to *where* students learned. The stand-alone, self-contained courses worked whether students were learning from home, a computer lab, or the library. Physical location simply didn't matter, provided that the learner had a good enough internet connection and a willing appetite for a fully virtual experience.

Those who provided the online courses soon discovered, however, that there is a limit to the number of students who can work without the explicit supervision and face-to-face mentoring of an adult. The same analysis in *Disrupting Class* that shows that 50 percent of all high school classes will be delivered online in some form by 2019 also reveals that homeschooling and full-time virtual schooling will *not* substitute for brick-and-mortar schooling, as their rapid growth flattens out at just under 10 percent of the U.S. K–12 student population.[7] That suggests that over 90 percent of students will continue to depend on adult supervision at brick-and-mortar schools.

This 90-percent estimate rings true. Most children need a safe place to be during the day outside of the home while their parents are busy. In fact, one of the main functions that schools perform is purely custodial—to watch over children and keep them safe. Most students also want a physical place to hang out together and have fun, as well as a place to receive help from their teachers, two other important aspects that can be separated from content delivery.

Eyeing the opportunity to harness the virtues of online learning for this 90 percent, innovative school leaders and teachers sought ways to weave online learning into the brick-and-mortar school experience. That effort produced the term "blended learning," which entered the K–12 education lexicon roughly at the turn of the twenty-first century. Because most parents and students need school to be more than purely virtual, the blend of online learning and K–12 campuses represents a major breakthrough in the integration of online learning into the mainstream.[8]

Outside of education, other purely virtual technologies have followed the same trail of adding a brick-and-mortar element to serve more people. For example, one way that some online retailers are gaining ground is by opening brick-and-mortar stores whose primary purpose is to serve as a showroom—a space where potential customers can test or try on inventory that was previously viewable only online—and then purchase from the online store. Bonobos, a men's apparel store that was once dogmatic about selling only online, opened six brick-and-mortar stores in 2012. The stores carry limited inventory and employ only a few salespeople. The retail "un-stores" are an example of disruption's upward march; after gaining a foothold by launching as a simple online solution, companies and organizations on a disruptive path pursue sustaining innovations—such as retail showrooms—to allow them to serve more demanding customers.[9]

WHAT BLENDED LEARNING IS—AND ISN'T

Blended learning is critically different from—but easily confused with—the much broader trend of equipping classrooms with devices and software. The common use of "blended learning" in education circles and the media suffers from a Goldilocks problem. People use the term either too broadly, to refer to all education technology ("edtech") crammed into a classroom, or too narrowly, to point to only the types of blended learning that they like best.

Beginning in 2010 we interviewed the educators behind over 150 blended-learning programs to arrive at a "just right" middle-ground definition that is broad enough to allow for variation but narrow enough to differentiate it from the bottomless category of the use of edtech in schools. It has three parts.

In Part through Online Learning

First, **blended learning is any formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace.**

The reference to a "formal education program" is important because it excludes instances when a student plays an educational Xbox game at home or browses a learning app in the grocery store line, independent of her formal school program. More critical to the definition, however, is "online learning, with some element of student control." In all blended-learning programs, students do some of their learning via the Internet. This does not mean using any digital tool, such as an online graphing calculator or Google Docs. Online learning means a bigger instructional shift from a face-to-face teacher to web-based content and instruction.[10]

Some element of student control is critical; otherwise, blended learning is no different from a teacher beaming online curriculum to a classroom of students through an electronic whiteboard. The technology used for the online learning must shift content and instruction to the control of the student in at least some way for it to qualify as blended learning from the student's perspective, rather than just the use of digital tools from the classroom teacher's perspective. It may be merely control of pace—the ability for students to pause, go back, or skip forward through online content as free agents. But often, online learning extends other types of control—in some cases students can choose the time at which they

do their online learning, the path they want to take to learn a concept, or even the location from which they want to complete the online work—whether in a brick-and-mortar classroom or anywhere else.[11]

Bottom line: unless an education program includes online learning with at least some element of student control of time, place, path, and/or pace, it is not blended learning.

In Part in a Supervised Brick-and-Mortar Location

The second part of the definition is that **the student learns at least in part in a supervised brick-and-mortar location away from home**. In other words, the student attends a physical school with teachers or guides. Often it's the neighborhood school, but in other cases it's a learning center that could even be housed in a shopping mall space that has been converted into a drop-in computer lab. What about students studying online at Starbucks? That's not blended learning; the supervision of a Starbucks barista does not count. What about students learning full-time online at the kitchen table? Those are not blended learners either because they are not experiencing the "away from home" part. Blended learning means that students have at least some on-campus, away-from-home component built into their schedule.

An Integrated Learning Experience

The third part of the definition is that **the modalities along each student's learning path within a course or subject are connected to provide an integrated learning experience**. This means that if students are learning U.S. history in a blended way, the online and face-to-face components work together to deliver an integrated course. The opposite of this would be that the students learn some topics online and then return to their traditional classroom to repeat them in a face-to-face lecture. To prevent such lack of coordination, most blended-learning programs use a computer-based data system to track each student's progress and try to match the modality—whether it is online, one-on-one, or small group—to the appropriate level and topic. But in some schools, the teachers record progress the old-fashioned way and try to connect the modalities manually. Either way, the key idea is that blended learning involves an actual "blend" of whatever formats are within the course of study. Many blended programs today have yet to achieve the ideal of full integration across modalities, but the concept

is nonetheless part of what most educators have in mind when they envision blended learning, and thus it is important to the definition.

Applying the Definition

Let's use this definition in a few hypothetical situations to see whether they are examples of blended learning.

> **Scenario 1**: Dominique's teacher posted all of his lesson plans, assignments, and quizzes on Blackboard's learning management system. Dominique can access this class page online from her brick-and-mortar classroom or from home using the tablet her school loaned her.
>
> **Scenario 2**: Matthew is a full-time student at Mountain Heights Academy, formerly known as the Open High School of Utah. He completes his work on his own off campus but connects with his online teachers live via webcam and Skype videoconferencing software. He also uses Skype to connect synchronously with the school's virtual chess club and virtual student government.
>
> **Scenario 3**: Angela enjoys playing online math games on the computer in the school library. She also takes algebra with a face-to-face teacher, who does not know about the online games but appreciates that Angela seems to be faster at recalling math facts.

If you concluded that none of these is an example of blended learning, you're correct. In the first scenario, the Internet is hosting information and tools for Dominique's class, but it is not managing the delivery of content and instruction; the face-to-face teacher is doing that. Thus Dominique does not have control over the time, place, path, or pace of her learning. The class is learning the same thing at the same time and moving through the curriculum as a single batch, or perhaps in a few groups, instead of using an online platform to serve each student the right level of content at each moment of instruction. Dominique is in a "technology-rich" classroom, but not a blended one.

The most common misnomer related to blended learning is to confuse blended learning with technology-rich instruction. Many schools are implementing one-to-one programs in which each student has access to a personal computing device. But the infusion of technology into schooling environments is not necessarily

synonymous with blended learning. This confusion isn't confined to America; it seems just as common in places from Europe to Asia. Appendix 1.1 further discusses technology-rich instruction, as well as other terms that are related to, or mistaken for, blended learning.

In the second scenario, Matthew is not learning in a supervised brick-and-mortar location away from home. He is connecting with his classmates and teachers in real time, but not face-to-face on campus. Matthew is a full-time virtual school student, not a blended learner.

In the third scenario, Angela's math activities are not connected to create an integrated, unified algebra course. She learns math in the library, but no one is collecting those data and using them to update her learning plan back in the traditional math class. Angela is using online learning in the library, but not as part of a blended-learning program.

MODELS OF BLENDED LEARNING

So if none of these is an example of blended learning, what does blended learning look like on the ground? Because blended learning is still in the messy early stages of its development, schools are thinking about blended learning in hundreds of ways as they experiment to figure out what works best for them. As a result, at first glance many educators say that their programs defy categorization—that they are completely different from any other.

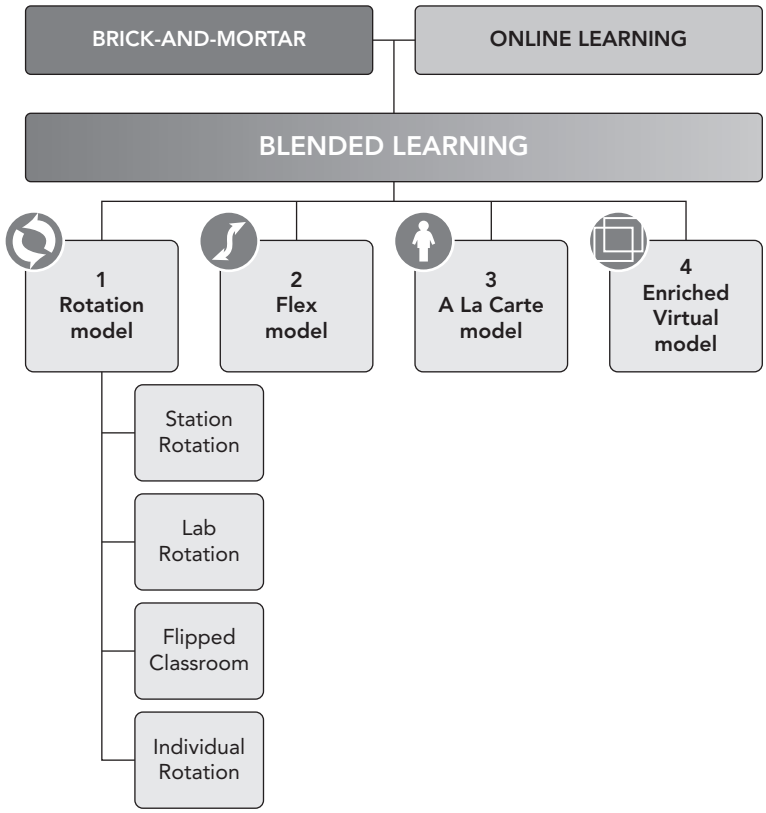
In our research, however, we have found that most blended courses fit somewhere within the broad parameters of four main models: Rotation, Flex, A La Carte, and Enriched Virtual. Figure 1.1 diagrams the relationships among these terms.

In many cases schools use multiple models and combine them in different ways to create a custom program. The purpose of these terms is to provide a language to describe the basic building blocks of the various combinations. The following sections describe each of these models and paint a picture of what they can look like in practice. The formal definition of each model and sample diagrams are in Appendix 1.2.

Rotation Model

The model that classroom teachers in particular gravitate toward first is the *Rotation* model. This category includes any course or subject in which students

Figure 1.1 Blended Learning Models



rotate — either on a fixed schedule or at the teacher's discretion — among learning modalities, at least one of which is online learning. Often students rotate among online learning, small-group instruction, and pencil-and-paper assignments at their desks. Or they may rotate between online learning and some type of whole-class discussion or project. The key is that the clock or the teacher announces that the time has arrived to rotate, and everyone shifts to their next assigned activity in the course.

The idea of rotating among stations is certainly not new to education. In fact, teachers have rotated groups of students among centers for decades, predominantly at the elementary school level. The new element is that online learning is now part of the cycle.

Station Rotation

In some cases, this rotation takes place within a classroom or set of classrooms. This is called a *Station Rotation*. The classic example is Scholastic's READ 180 program; it has been helping classrooms transition to a Station Rotation model since its start in 1998, and now, with over forty thousand classrooms using READ 180, it is one of the longest-lived and most widely distributed examples of the model.[12] The READ 180 system, which targets students from elementary through high school whose reading achievement is below proficiency, directs classroom teachers to begin and end each class session with a whole-group discussion that engages the entire class. In between, students break into groups and rotate through three stations:

1. **Small-group direct instruction**, in which the teacher uses resource books and works closely with individual students
2. **Individual learning**, using READ 180 software to practice reading skills
3. **Modeled and independent reading**, in which students use READ 180 paperbacks or audio books

According to the What Works Clearinghouse (WWC), a government-run database that provides research analysis about what works in education to improve student outcomes, the READ 180 program has resulted in an average gain of 12 percentile points for reading achievement and 4 points for reading comprehension among adolescent learners. Based on these results, WWC considers the extent of evidence for the program's potentially positive effects to be "medium to large," although no studies of READ 180 fall entirely within the scope of the review protocol for WWC evidence standards.[13] Apart from its effectiveness, however, its sheer size makes it a prominent example of a Station Rotation.

For those who want additional examples of Station Rotations, as well as of the other blended models, the Christensen Institute maintains the "Blended Learning Universe [BLU]" (available at www.blendedlearning.org), a database of blended-learning programs worldwide that is searchable by model and other features. The BLU lists several Station Rotation examples, including KIPP Empower, which was profiled in the introduction[14]; schools in California's Oakland Unified School District; several Pennsylvania districts involved in the Pennsylvania Hybrid Learning Initiative; the Alliance College-Ready Public Schools' network of charter schools; schools in the Aspire Public Schools network; Mission Dolores

Academy in San Francisco, an independent, K-8 Catholic school; The Avenues: World School, a high-end private school in New York City; and the Elia Sarwat High School and the Zaya Learning Center, both in Mumbai, India.

WATCH CLIP 3: Alliance College-Ready Public Schools uses a Station Rotation to provide the same material in three different ways.

www.wiley.com/go/blended3

WATCH CLIP 4: Aspire ERES Academy uses a Station Rotation to facilitate differentiated instruction.

www.wiley.com/go/blended4

WATCH CLIP 5: Mission Dolores Academy, a Catholic school in San Francisco, uses the Station Rotation model to meet individual needs in a financially sustainable way.

www.wiley.com/go/blended5

WATCH CLIP 6: The Avenues: World School provides students with laptops and an open learning environment to support its Station Rotation.

www.wiley.com/go/blended6

Lab Rotation

Lab Rotation is similar to Station Rotation, but students walk to a computer lab for the online-learning portion of the course. The idea is to free up teacher time and classroom space by using a computer lab and a different staffing structure for the online component. Schools have used computer labs for decades; the key difference today is that teachers are starting to integrate the computer time with the classroom time to create a seamless course.

Many people credit Rocketship Education in San Jose, California for putting Lab Rotation on the map. John Danner and Preston Smith launched the charter management organization in 2006 to help eliminate the achievement gap—the gap in academic performance between ethnic and socioeconomic groups. The goal was to help one million low-income, urban elementary students accelerate academically without depending on outside grants and fundraising to supplement the per-pupil funding their schools received from the government.[15]

To reach this goal, Danner and Smith set up a Lab Rotation model in which students spend 25 percent of their school day in a learning lab, where they practice core skills online. Monitors, rather than certified teachers, supervise students during lab time. During the other 75 percent of the day, students remain in their teacher-led classrooms for one block of math and science and two blocks of literacy and social studies. This model allows Rocketship to staff its schools with approximately 75 percent of the teachers that a traditional school would use, as well as 75 percent of the facility space that a typical elementary school would occupy. It also frees classroom teachers to focus on concept extension and critical-thinking skills, rather than on teaching and rehearsing basic skills.

WATCH CLIP 7: Rocketship Education relies on a strong culture and innovative staffing model to facilitate its Lab Rotation.

www.wiley.com/go/blended7

After its third year, Rocketship's first school ranked first in Santa Clara County and fifth in California when compared with similar schools—those with at least 70 percent low-income students. Rocketship's second school achieved similar acclaim. By the 2011–12 school year, the percentage of Rocketship students who scored "proficient" or "advanced" on the California standards for math was only five points lower than students in California's high-income districts—a notable step toward closing the achievement gap.[16] The Lab Rotation model helped the schools generate annual savings of approximately $500,000 in traditional expenditures per school. Rocketship doesn't actually "save" this money; it uses the spare funds to pay its teachers higher salaries (10 to 30 percent higher than surrounding districts), provide an extended school day and year, offer leadership training, and employ three or four school leaders who provide tailored professional development for its teachers.

Other places listed in the BLU as examples of Lab Rotation include the FirstLine schools in New Orleans, some elementary schools in California's Milpitas Unified Public School District, the middle and high schools in Kentucky's Danville Independent School District, and the Spark private schools in Johannesburg, South Africa.

Flipped Classroom

The third type of Rotation model, and the one that has received the most attention in the press to this point, is the Flipped Classroom, so named because it flips the typical function of the classroom on its head. In a classroom that's flipped,

students consume online lessons or lectures independently, whether at home or during a homework period on campus. Time in the classroom, previously reserved for teacher instruction, is instead spent on what we used to call homework, with teachers providing assistance as needed.[17]

How can this improve student learning? Homework and lecture time have merely been switched. Students still learn through a lecture, and many online lectures are primitive videos.

Although there is truth in this characterization, it misses the key insight behind the Flipped Classroom. If some students don't understand what is presented in a real-time classroom lecture, they have little recourse. The teacher can try to slow down or speed up to adjust to differentiated needs, but inevitably what is too fast for one student is too slow for another. Moving the delivery of basic instruction to an online format gives students the opportunity to hit rewind or fast-forward according to their speed of mastery. Students decide what to watch and when, and this—theoretically at least—gives them greater ownership over their learning.

Viewing lectures online may not seem to differ much from the traditional homework reading assignment, but there is at least one critical difference: classroom time is no longer spent taking in raw content, a largely passive process. Instead, while at school, students do practice problems, discuss issues, or work on projects. Classroom time becomes a time for active learning, which thousands of research studies on learning indicate is far more effective than passive learning.[18] "From cognitive science, we hear that learning is a process of moving information from short-term to long-term memory," said Terry Aladjem of Harvard University's Bok Center for Teaching and Learning. "Assessment research has proven that active learning does that best."[19]

Jon Bergmann and Aaron Simms, science teachers at Woodland Park High School in Woodland Park, Colorado, began flipping their classrooms in 2007; many regard them as the pioneers of the Flipped Classroom at the high school level. "The key question," Bergmann says, "is what is the best use of your face-to-face class time? I would argue, at least in my case, that it was not me standing in front of my students yakking. That was not the correct answer; the correct answer was hands-on activities, inquiry- and project-based learning, and all those things that we have known that research has borne out to be effective and meaningful and important."[20]

WATCH CLIP 8: Aaron Sams discusses how and why he flips his Woodland Park High School classroom.

www.wiley.com/go/blended8

In 2013 the J. A. and Kathryn Albertson Foundation gave $1.5 million in grants to Idaho schools to try Khan Academy, mostly through a Flipped Classroom model. Forty-eight schools and twelve thousand Idaho students took part in the pilot project. Shelby Harris, a middle school math teacher at Kuna Middle School, says that as a result of this pilot, she no longer lectures in class. Instead, she works with students one-on-one or in small groups. "In some ways it feels less … teacher-ish," she said. "You almost have to redefine how you see yourself as a teacher." She regards herself now as a sideline coach, or even a cheerleader.[21]

Examples from the BLU of other schools that use the Flipped Classroom include those in the Stillwater Area Public School District in Minnesota, the Achievement First Charter Schools throughout New York and Connecticut, the Binah School for Jewish education in Massachusetts, the Catholic Schools Diocese of Phoenix, and the Dongpyeong Middle School in Busan, South Korea.[22]

WATCH CLIP 9: Some teachers at DongPyeong Middle School flipped their classrooms to engage their students and boost learning.

www.wiley.com/go/blended9

Individual Rotation

Individual Rotation is the fourth Rotation model. If this model were to wear a bumper sticker, it would be "Choose Your Modality"—the same motto that inspired Joel Rose to launch Teach to One, which we mention in the introduction to this book.[23] In an Individual Rotation, students rotate on an individually customized schedule among learning modalities. Either an algorithm or a teacher sets each student's schedule. Individual Rotations are different from the other rotation models because students do not necessarily rotate to each available station or modality; their daily schedules are customized according to individual playlists.

Students in the Teach to One program take a short assessment at the end of class each day. An algorithm analyzes the results to match students to lessons and resources that will best match their individual needs for the following day. The result is a unique daily schedule for each student and teacher. As it collects data, Teach to One learns more about students and ideally becomes even better at predicting the playlist that will be most effective for each student.

Carpe Diem Schools, which began in Yuma, Arizona, and now runs schools in several states, is another example of an Individual Rotation. The school's founder, Rick Ogston, began envisioning a whole-school blended model in 2003 (he was arguably one of the earliest blended-learning visionaries in that regard).[24] A large room filled with computers—similar in layout to a call center—is located in the middle of Carpe Diem's first blended school in Yuma (the design has evolved as it has expanded to new states). Students rotate every thirty-five minutes among different stations, which range from self-paced online learning using Edgenuity software in the large learning center to face-to-face learning experiences in breakout rooms along the periphery. Each student has an individualized playlist to guide him through the rotations. Paraprofessionals are on hand to assist students with Edgenuity. In the breakout rooms, a face-to-face teacher expands on the material introduced online and helps students apply it.

WATCH CLIP 10: The Individual Rotation model at Carpe Diem in Yuma, Arizona, relies on a unique facility and staffing design.

www.wiley.com/go/blended10

Charter schools in Arizona receive roughly $1,700 less per pupil each year than district schools. But because Carpe Diem's model requires fewer certified teachers, the Yuma school spends only $5,300 of the $6,300 per student the school receives. Most of the rest goes toward paying off the bond on the $2.6 million facility.[25] The facility itself represents a significant cost savings; with only five breakout rooms, it has fewer than half the classrooms that a traditional school requires for a similar enrollment level. A nearby traditional school building that accommodates only two hundred more students than the Yuma site cost roughly $12 million — over 2.5 times more expensive per student.

Four years after transitioning to an Individual Rotation, Carpe Diem's Yuma campus ranked first in its county in student performance for almost all grade levels and subjects on Arizona's statewide standardized test. *Bloomberg Businessweek* voted the school "Best Improved" on its 2009 America's Best High Schools List. The following year, the Yuma campus ranked first in its county in student performance in math and among the top 10 percent of Arizona charter schools. *U.S. News & World Report* named it a Bronze Medal School in its 2010 Best High Schools rankings.

Other schools listed in the BLU that use Individual Rotation include A. L. Holmes Elementary-Middle School in Detroit; Downtown College Prep Alum Rock in San Jose, California; Education Plus Academy in Wyncote, Pennsylvania; and Milan Village School in Milan, New Hampshire.

Flex Model

Even before many educators around the world were flipping their classrooms or adding online learning to their in-class stations, another group was pioneering a

different model of blended learning outside of mainstream classrooms, primarily in credit recovery labs and alternative education centers. In south central Kansas, for example, Wichita Public Schools began contracting with Apex Learning during the 2007–08 school year to provide online courses to students who needed to recover credits or who had dropped out of school. It leased storefront spaces at local malls and converted them into large, open-space learning centers, where students could show up any time throughout the day to complete Apex courses under the supervision of credentialed, on-site teachers. Within a year, Wichita's program helped 449 students complete 931 courses — not a small number for that district.[26]

School systems began relying on online learning to deliver the backbone of student learning for other pockets of students, including those who wanted access to advanced courses, high school dropouts attracted to the idea of an "un-classroom" experience, and students in need of summer school. The programs required that students show up to a campus where they would access content and instruction primarily online. In contrast to the more rigid schedules of Rotation models, these alternative programs allowed students to learn via an individually customized, fluid schedule among learning modalities, which meant that they could alternate between online learning and face-to-face formats, such as tutoring or small-group discussion, when necessary and on a case-by-case basis.

The umbrella term for this type of schooling is the *Flex* model. The term refers to courses or subjects in which online learning is the backbone of student learning, even if it directs students to offline activities at times. The teacher of record is on-site, and students learn mostly on a brick-and-mortar campus, except for any homework. Students move through a Flex course according to their individual needs. Face-to-face teachers are on hand to offer help, and in many programs they initiate projects and discussions to enrich and deepen learning, although in other programs they are less involved.

Tom Vander Ark, the author of *Getting Smart*, identified a key difference between Rotation and Flex models when he said that, in general, "Rotation schools add some online learning to what otherwise may look like a traditional school, [whereas] Flex schools start with online learning and add physical supports and connections where valuable."[27] (The exception to this observation, we note, is Individual Rotation, which is more like the Flex model from this perspective.)

Although most Flex programs began by serving dropouts and other nonconsumers of mainstream education, the model is starting to arise within schools' core academic classes. The Education Achievement Authority (EAA) is

Michigan's school improvement district. It takes on the tough job of turning around the lowest 5 percent of persistently failing schools in the state. Its mission is to "disrupt traditional public schooling and provide a scalable prototype for 21st century teaching and learning." To do this, some EAA schools are relying on the Flex model.[28]

At Nolan Elementary-Middle School in Detroit, the EAA has replaced rows of desks with tables, floor pillows, and workstations. Furniture is modular to allow for flexible groupings, which is important because Nolan groups students by readiness, not by grade. The backbone of the model is Agilix's Buzz platform, a technology infrastructure that allows students to select and manage their own learning plans, demonstrate the ability to apply their knowledge in teacher-graded performance tasks and common assessments, and earn badges as they demonstrate citizenship and academic progress—all hallmarks of a competency-based system. Buzz also helps instructors monitor students so they can provide strategic intervention.[29] In 2013, at the end of its first year of turnaround, 71 percent of students at Nolan achieved one or more years of growth in reading and 61 percent in math. Nolan ranked third out of 124 Detroit schools in reading growth.[30]

Other examples from the BLU of Flex programs include Innovations High School in Salt Lake City; Lufkin High School in Lufkin, Texas; Flex Public Schools, managed historically by K12, Inc.; Nexus Academy, managed by Connections Education, which is part of Pearson; Buena Vista Elementary School in Nashville; Edison Learning's Dropout Solutions Centers; the network of AdvancePath schools; the network of SIATech schools; Algoma High School in Algoma, Wisconsin; and the Charles E. Smith Jewish Day School in Rockville, Maryland.

WATCH CLIP 11: At San Francisco Flex Academy, students learn online and get help on a flexible basis from academic coaches and teachers.

www.wiley.com/go/blended11

A La Carte Model

The most common form of blended learning at the high school level is the *A La Carte* model.[31] This model includes any course that a student takes entirely online while also attending a brick-and-mortar school. Suppose the neighborhood high school does not offer Mandarin Chinese or physics, for example. Students can take those courses online during study hall or after school, in addition to the regular classes they are taking on campus. This is a form of blended learning because the students are experiencing a blend of online learning and brick-and-mortar schooling, despite that fact that the online courses themselves do not have a face-to-face component. A La Carte courses can have offline components, just as Flex courses do. But the key distinguishing feature between the two is that with A La Carte, the teacher of record is the online teacher, whereas with Flex, the teacher of record is the face-to-face teacher.

A La Carte is expanding, as more states require that students take an online course prior to graduation. As of April 2014, six states had some version of this requirement: Alabama, Arkansas, Florida, Idaho, Michigan, and Virginia. Other states are promoting A La Carte courses by funding student choice at the course level, which means that they guarantee funding for students to take a given number of online courses each year. Utah was one of the first states to offer course-level student choice. Starting in 2012, students in Utah could supplement their brick-and-mortar education with up to two approved online courses per year, which will expand to six by 2016.

The Abraham family in Canadian, Texas shows why A La Carte is gaining popularity. Canadian is a town of 2,649 people in the far north corner of the Texas panhandle. The place is so remote that a portion of the Tom Hanks movie *Cast Away,* about a man who is stranded on a deserted island, was filmed there. The Abrahams have eight children and are intent on giving their children the opportunity to attend top universities if they choose. The problem, however, is that Canadian High School, the only high school for miles, has a total of 206 students. It cannot afford to provide the full menu of Advanced Placement, foreign language, and elective courses that the Abraham children need to compete, or even qualify, for admission to top-tier colleges.

Salem Abraham, father to the eight children, sat on the local school board for twelve years and has fought hard to bring access to A La Carte courses not only to students in his town but also to all Texas students, particularly those in rural areas.

His strategy has paid off so far for his family at least; his oldest child was admitted to Harvard, his second to Notre Dame, and his third to Stanford—successes that the Abrahams attribute in part to the Spanish 4 and other advanced courses their teens took online because Canadian High School did not offer them.

Enriched Virtual

The fourth blended-learning model is *Enriched Virtual*. This model describes courses that offer required face-to-face learning sessions but allow students to do the rest of the work online from wherever they prefer. Some courses may meet in person on Tuesdays and Thursdays, for example, and allow the students to work independently on online lessons, whether on or off campus, on Mondays, Wednesdays, and Fridays. Others may customize the in-person meeting requirement based on student progress; if the student is falling behind, she must meet face-to-face more often.

The model differs from Flipped Classroom because in Enriched Virtual classes, students seldom meet face-to-face with the teacher every weekday. It differs from a fully online course because brick-and-mortar experiences are required; they're not merely optional office hours or social events.

Many Enriched Virtual programs began as full-time online schools and then, noticing that their students needed more support, developed blended programs to provide face-to-face enrichment and a safe, peaceful physical setting. One example is Commonwealth Connections Academy (CCA), a virtual charter school that Connections Education operates to serve more than 9,000 students across the state of Pennsylvania. CCA opened in 2003 as a full-time virtual school, but as enrollments increased, a subset of students struggled with their online work. Some had unreliable internet connections at home, despite the internet-access subsidy that CCA provided. Others felt too isolated. Many needed more face-to-face community and connection. CCA decided the solution was to create brick-and-mortar centers for students and teachers to congregate.[32]

In 2012, CCA opened the first teaching center in Downtown Philadelphia for anyone who wanted to learn in a blended setting and encouraged struggling students to take advantage of the opportunity. By the 2013–14 school year, roughly 150 students were enrolled at the Philadelphia center. At that location, students attend two to four days per week, either for the morning session (8:15 A.M.—11:30 A.M.) or the afternoon session (12:15 P.M.—3:30 P.M.), depending

on their preferences. Every staff member in the facility oversees a homeroom of fifteen to seventeen students and works with those students as an advisor. The school is open Monday through Friday, but it closes early on Friday to give faculty time for a critical job: assigning student schedules for the upcoming week. During those Friday afternoon meetings, staff members review student data and discuss which students need a change. They communicate changes to homeroom teachers, who in turn email or phone their students to advise them of their schedule for the following week, including the days they need to be on campus and the teachers with whom they need to meet.

All CCA students have certified online teachers who serve as their teachers of record for each subject. Those who attend the teaching center, however, have additional layers of support. For math and English/Language Arts (ELA), a face-to-face certified teacher meets with groups of seven to eight students to reteach as necessary and then reset assignments and quizzes to test for mastery afterward. They also hold office hours on Friday mornings for students who want one-on-one help. Students work on other courses—science, social studies, foreign languages, and electives—from an on-site learning café, where "success coaches" are available to meet with them one-on-one and in small groups. Success coaches are subject-matter experts who have work experience and advanced degrees, but not traditional teacher certification. The staffing model is collaborative; although the virtual teachers are the teachers of record, the face-to-face teachers provide critical supplementation.

The Philadelphia center provides students with bus tokens to travel to the center using public transportation. Some travel from neighboring counties for the opportunity to be part of the face-to-face community. In many ways CCA's centers give form to the underlying motivation for an Enriched Virtual blend; typically such models offer support and a brick-and-mortar "home" for students who want to learn predominantly online, with the associated flexibility that that can offer, but need a place and community in which to do so.

Other examples in the BLU of Enriched Virtual programs include Impact Academy in Henry County Schools, Georgia; Arizona Virtual Academy; Chicago Virtual Charter School; Falcon Virtual Academy in Colorado Springs; Fairmont Preparatory Academy in Anaheim, California; Hawaii Technology Academy; New Mexico Virtual Academy; Rio Rancho Cyber Academy in New Mexico; and Riverside Virtual School in Riverside, California.

WATCH CLIP 12: Henry County Schools in Georgia provide a learning space and face-to-face teachers to enrich students who are taking online courses at Impact Academy.

www.wiley.com/go/blended12

MIXING OF BLENDED MODELS

We have amended the descriptions of the blended-learning models several times to make them as comprehensive as possible—that is, the set of models attempts to describe the entire range of existing blended-learning environments. But the categories are by no means mutually exclusive. Many programs mix and match the models. The result is a combination approach.

Some schools combine the Flipped Classroom with Lab Rotation. Students learn online at home and then rotate to a computer lab during a portion of their on-campus schedule. Other schools match Flex with Enriched Virtual. At the end of Chapter Eight we provide more detail about programs that combine models. Generally speaking, if it does not fit squarely within the Rotation, Flex, A La Carte, or Enriched Virtual definition, a blended-learning program is likely a combination of those models. Furthermore, some schools operate several models and combinations of models at the same time to serve different populations of students in different subjects under the same roof.

To Sum Up

- More than 90 percent of U.S. students need custodial supervision away from home during the day. Online learning is growing by blending into brick-and-mortar schools to serve these students.
- The definition of blended learning is a formal education program in which a student learns at least in part through online learning 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. The modalities along each student's learning path in a course or subject are connected to provide an integrated learning experience.
- Blended learning is different from technology-rich instruction. With the former, students have at least some control of the time, place, path, and/or pace of their learning, whereas with the latter, the learning activities are standardized across the class.
- Four models of K–12 blended learning are most common: Rotation (which includes the Station Rotation, Lab Rotation, Flipped Classroom, and Individual Rotation models), Flex, A La Carte, and Enriched Virtual.
- The Christensen Institute maintains the ''Blended Learning Universe [BLU],'' a database tool that organizes and presents data about blended programs, which are searchable by model and other features. You can access the BLU at www.blendedlearning.org.
- Many schools are mixing and matching models.

APPENDIX 1.1: DISCUSSION OF KEY TERMS

Online learning is education in which the Internet delivers content and instruction. Some online learning involves an *online teacher*—a real person who interacts with the students, reviews their assignments, and imparts instruction entirely over the Internet. Online learning may be *synchronous* (communication in which participants interact in real time, such as online video conferencing) or *asynchronous* (communication separated by time, such as email or online discussion forums).[33]

Traditional instruction resembles a factory system and is a remnant of the industrial era. The system groups students by age, promotes them from one grade to the next in batches, and offers all students in each cohort a single, unified curriculum that is delivered based on the time of the year. The instructional format is predominantly face-to-face, teacher-led lectures or demonstrations of the material (the general term for this format is *direct instruction*). Instructional materials are mainly textbooks, lectures, and written assignments. Courses and subjects are often individual and independent instead of integrated and interdisciplinary, particularly in secondary school. One of the main functions of the traditional classroom is to keep students learning in their seats for the prescribed number of minutes (this is called *seat time* in public-education code.)

Technology-rich instruction shares the features of traditional instruction, but has digital enhancements such as electronic whiteboards, broad access to internet devices, document cameras, digital textbooks, internet tools, Google docs, and online lesson plans. Despite the presence of digital tools, online learning does not generally replace face-to-face instruction for content delivery.

Blended learning is a formal education program in which a student learns at least in part through online learning 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. The modalities along each student's learning path in a course or subject are connected to provide an integrated learning experience. Blended learning is the engine that can make student-centered learning possible for students worldwide, rather than only for the privileged few. Because of its modular architecture, online learning is inherently suited to providing personalized, competency-based learning at an affordable cost, so these terms often go hand in hand.[34]

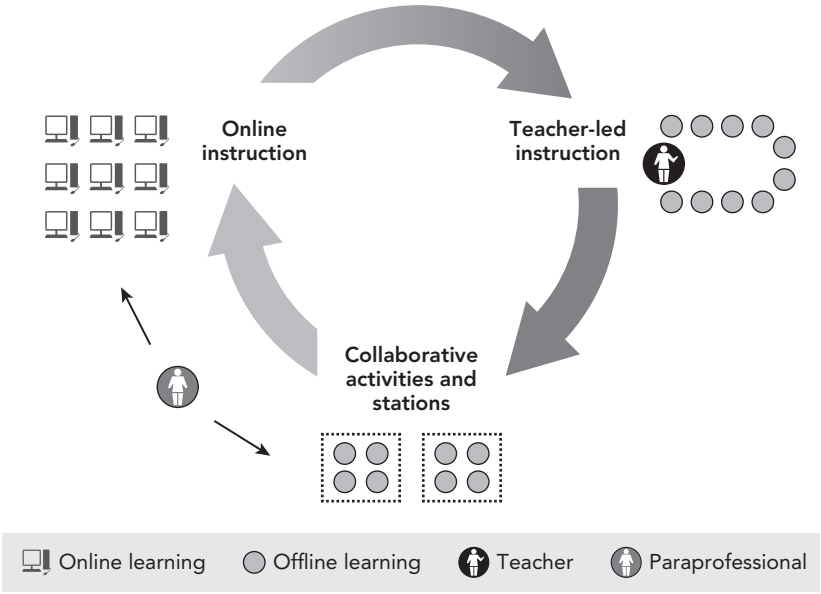
Project-based learning focuses on helping students explore real-world problems and challenges in a dynamic, engaged, active way. The intent is to inspire students to obtain a deeper understanding of the subjects they are studying.[35] Many blended-learning programs pair online learning with project-based learning to help students demonstrate that they can apply their knowledge and connect their understanding across disciplines. Project-based learning can take place online and offline.

APPENDIX 1.2: K–12 BLENDED-LEARNING TAXONOMY

The following taxonomy is imperfect and continues to evolve. It is a snapshot of the types of blended-learning programs that we see today across K–12 education in the United States and abroad.

1. **Rotation model** — a course or subject in which students rotate on a fixed schedule or at the teacher's discretion between learning modalities, at least one of which is online learning. Other modalities might include activities such as small-group or full-class instruction, group projects, individual tutoring, and pencil-and-paper assignments. Students learn mostly on the brick-and-mortar campus, except for any homework assignments.
    a. **Station Rotation** — a course or subject in which students experience the Rotation model within a contained classroom or group of classrooms. The Station Rotation model differs from the Individual Rotation model because students rotate through all of the stations, not only those on their custom schedules. (See Figure A1.1.)
    b. **Lab Rotation** — a course or subject in which students rotate to a computer lab for the online-learning station. (See Figure A1.2.)
    c. **Flipped Classroom** — a course or subject in which students participate in online learning off-site in place of traditional homework and then attend the brick-and-mortar school for face-to-face, teacher-guided practice or projects. The primary delivery of content and instruction is online, which differentiates a Flipped Classroom from students who are merely doing homework practice online at night. (See Figure A1.3.)
    d. **Individual Rotation** — a course or subject in which each student has an individualized playlist and does not necessarily rotate to each available

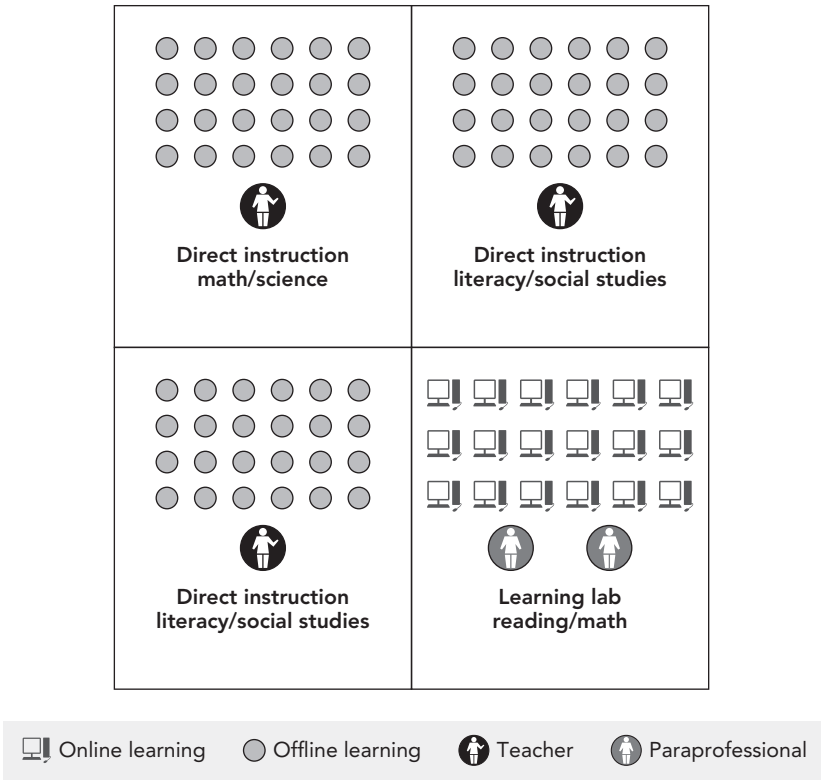
Figure A1.1 Station Rotation



station or modality. An algorithm or teacher(s) sets individual student schedules. (See Figure A1.4.)

2. **Flex model**—a course or subject in which online learning is the backbone of student learning, even if it directs students to offline activities at times. Students move on an individually customized, fluid schedule among learning modalities. The teacher of record is on-site, and students learn mostly on the brick-and-mortar campus, except for any homework assignments. The teacher of record or other adults provide face-to-face support on a flexible and adaptive as-needed basis through activities such as small-group instruction, group projects, and individual tutoring. Some implementations have substantial face-to-face support, whereas others have minimal support. For example, some Flex models may have face-to-face certified teachers who supplement the online learning on a daily basis, whereas others may provide little face-to-face enrichment. Still others may have different staffing combinations. These variations are useful modifiers to describe a particular Flex model. (See Figure A1.5.)

Figure A1.2 Lab Rotation



3. **A La Carte model**—a course that a student takes entirely online to accompany other experiences that the student is having at a brick-and-mortar school or learning center. The teacher of record for the A La Carte course is the online teacher. Students may take the A La Carte course either on the brick-and-mortar campus or off-site. This differs from full-time online learning because it is not a whole-school experience. Students take some courses A La Carte and others face-to-face at a brick-and-mortar campus. (See Figure A1.6.)
4. **Enriched Virtual model**—a course or subject in which students have required face-to-face learning sessions with their teacher of record and then are free to complete their remaining coursework remote from the face-to-face teacher. Online learning is the backbone of student learning when the

Figure A1.3 Flipped Classroom

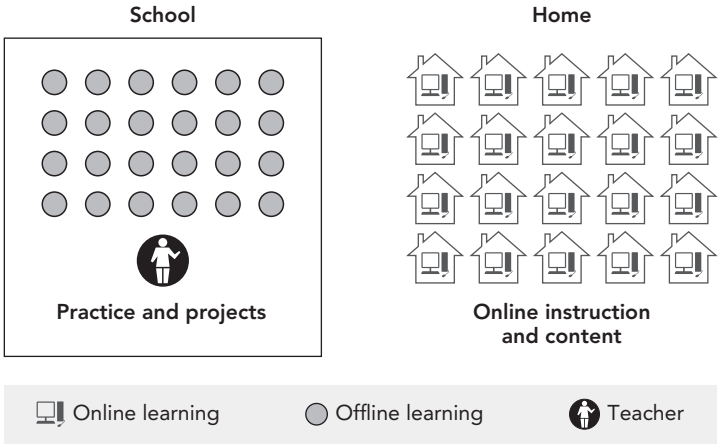


Figure A1.4 Individual Rotation

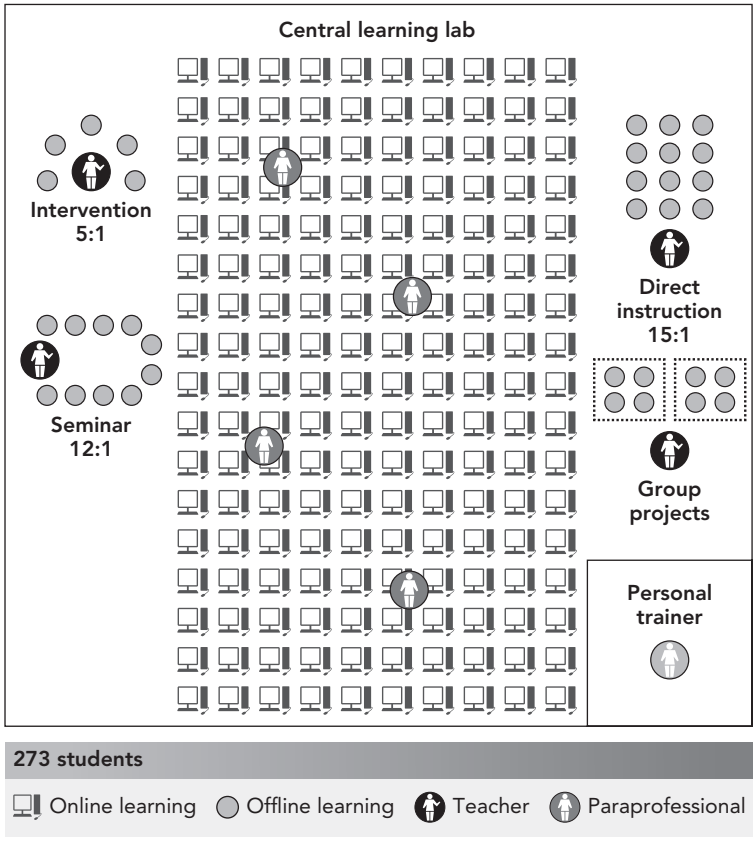


Figure A1.5 Flex Model

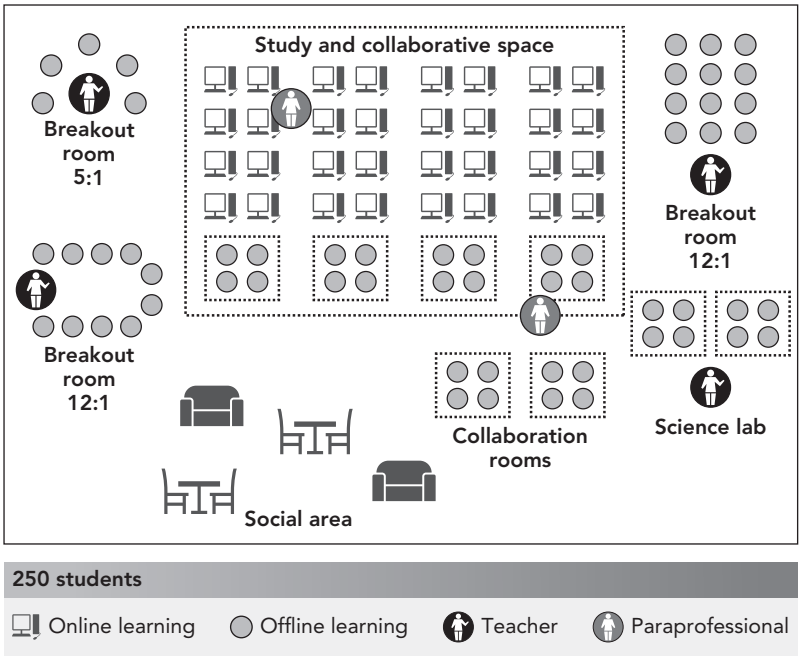


Figure A1.6 A La Carte Model

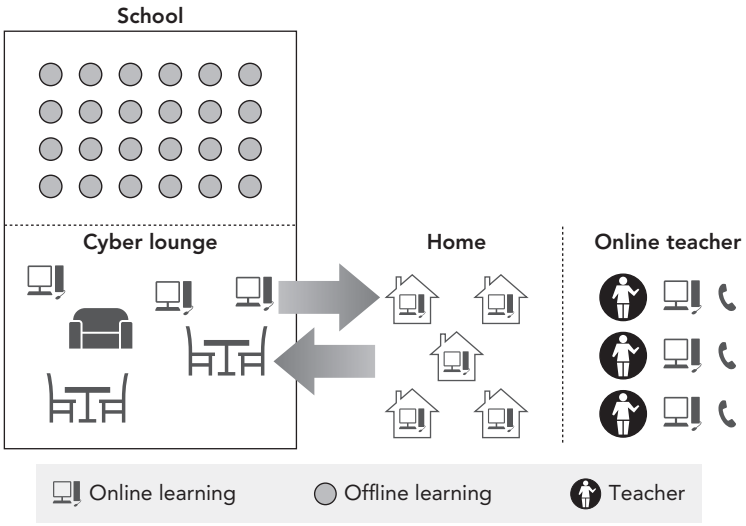
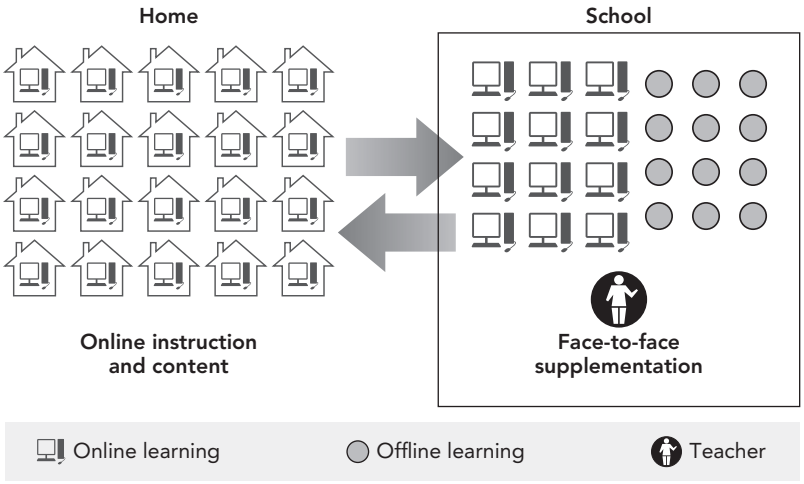


Figure A1.7 Enriched Virtual Model



students are located remotely. The same person generally serves as both the online and face-to-face teacher. Many Enriched Virtual programs began as full-time online schools and then developed blended programs to provide students with brick-and-mortar school experiences. The Enriched Virtual model differs from the Flipped Classroom because in Enriched Virtual programs, students meet face-to-face with their teachers every weekday. It differs from a fully online course because face-to-face learning sessions are more than optional office hours or social events; they are required. (See Figure A1.7.)

NOTES

1. "Fact Pack," Khan Academy, April 1, 2014, https://dl.dropboxusercontent.com/u/33330500/KAPressFactPack.pdf
2. Interview with Francie Alexander, Chief Learning Officer, Scholastic, Inc., September 6, 2013.
3. John Watson, Amy Murin, Lauren Vashaw, Butch Gemin, and Chris Rapp, *Keeping Pace with K–12 Online & Blended Learning: An Annual Review*

of Policy and Practice, 2013, Evergreen Education Group, http://kpk12.com/cms/wp-content/uploads/EEG_KP2013-lr.pdf, p. 17.

4. *Disrupting Class* estimates that in the past couple of decades leading up to the book's publication in 2008, schools spent well over $60 billion in equipping classrooms with computers. See Clayton M. Christensen, Michael B. Horn, and Curtis W. Johnson, *Disrupting Class* (New York: McGraw Hill, 2011), p. 81. We are indebted to Sean Kennedy of the Lexington Institute for updating the number to $100 billion to take into account more recent expenditures. See Sean Kennedy, "School Tech Plan Unlikely to Help Blended Learning," Lexington Institute, May 9, 2013, http://www.lexingtoninstitute.org/school-tech-plan-unlikely-to-help-blended-learning/?a=1&c=1136 (accessed April 10, 2014).
5. Christensen, Horn, and Johnson, *Disrupting Class*, p. 98.
6. Heather Staker, *The Rise of K–12 Blended Learning: Profiles of Emerging Models,* Clayton Christensen Institute and Charter School Growth Fund, May 2011, http://www.christenseninstitute.org/wp-content/uploads/2013/04/The-rise-of-K-12-blended-learning.emerging-models.pdf, p. 93.
7. Michael B. Horn and Heather Staker, "The Rise of K−12 Blended Learning," Clayton Christensen Institute, January 2011, http://www.christensen institute.org/wp-content/uploads/2013/04/The-rise-of-K-12-blended-learning.pdf, p. 2.
8. According to respondents to a California survey, K−12 blended learning is growing quickly. From 2012 to 2014, blended learning in traditional districts grew 43 percent, while charters experienced a whopping 287 percent increase. Overall, 74 percent more students were experiencing blended learning in 2014 than in 2012. Brian Bridges, "California eLearning Census: Increasing Depth and Breadth," California Learning Resource Network, April 2014, http://www.clrn.org/census/eLearning%20Census_Report_2014.pdf.
9. Other examples of enterprises that were once avowedly web-only and then later opened physical stores include online eyeglass retailer Warby Parker, the women's fashion retailer Piperlime, and the online beauty subscription company Birchbox. Hilary Stout, "Birchbox, Seller of Beauty Products,

Steps Out From Web With a Store," *The New York Times,* March 23, 2014, http://www.nytimes.com/2014/03/24/business/birchbox-seller-of-beauty-products-steps-out-from-web-with-a-store.html?_r=1 (accessed April 10, 2014).

10. We agree with Tom Vander Ark's characterization of blended learning: "Compared to high-access environments, which simply provide devices for every student, blended learning includes an intentional shift to online instructional delivery for a portion of the day in order to boost learning and productivity." Digital Learning Now!, Blended Learning Implementation Guide 2.0, September 2013, http://learningaccelerator.org/media/5965a4f8/DLNSS.BL2PDF.9.24.13.pdf, p. 3.
11. Florida Virtual School originated and trademarked the motto "Any Time, Any Place, Any Path, Any Pace" to reflect its philosophy that learning is an ongoing activity not confined solely to classrooms and class schedules. Its motto captures some of the inherent educational benefits of online learning for students. See Katherine Mackey and Michael B. Horn, "Florida Virtual School: Building the First Statewide, Internet-based Public High School," Clayton Christensen Institute, October 2009, http://www.christensen institute.org/wp-content/uploads/2013/04/Florida-Virtual-School.pdf, p. 3.
12. READ 180 was not technically blended learning until 2010 because before then students experienced the software through CD-ROM or a local server, not online. But students did rotate between READ 180 software and face-to-face stations from the start in 1998, so in practice the experience was similar to blended learning.
13. "READ 180," What Works Clearinghouse, Institute of Education Sciences, October 2009, http://ies.ed.gov/ncee/wwc/pdf/intervention_reports/wwc_read180_102009.pdf.
14. Ian Quillen, "Los Angeles Empower Academy First School in KIPP Network to Embrace Blended Learning," *Huffington Post*, November 20, 2012, http://www.huffingtonpost.com/2012/11/20/la-school-first-in-kipp_n_2166918.html (accessed September 10, 2012).

15. This section about Rocketship Education is based on the profile that Eric Chan of the Charter School Growth Fund contributed to the report by Heather Staker, *The Rise of K–12 Blended Learning* (see n. 6), pp. 131–133.
16. Sharon Kebschull and Joe Ableidinger, "Rocketship Education: Pioneering Charter Network Innovates Again, Bringing Tech Closer to Teachers," Opportunity Culture, Spring 2013, http://opportunityculture.org/wp-content/uploads/2013/07/Rocketship_Education_An_Opportunity_Culture_Case_Study-Public_Impact.pdf?utm_content=mhorn%40innosightinstitute.org&utm_source=VerticalResponse&utm_medium=Email&utm_term=Rocketship%20Education%3A%20Pioneering%20Charter%20Network%20Innovates%20Again%2C%20Bringing%20Tech%20Closer%20to%20Teachers&utm_campaign=Rocketship%20Education%3A%20Bringing%20tech%20closer%20to%20teacherscontent (accessed July 31, 2013).
17. This section about the Flipped Classroom is adapted from Michael B. Horn's article entitled "The Transformational Potential of Flipped Classrooms," *Education Next,* Summer 2013, Vol. 13, No. 3, http://educationnext.org/the-transformational-potential-of-flipped-classrooms/ (accessed September 10, 2013).
18. Craig Lambert, "Twilight of the Lecture," *Harvard Magazine*, March-April 2012, http://harvardmagazine.com/2012/03/twilight-of-the-lecture (accessed September 10, 2012).
19. Ibid. The article also highlights Eric Mazur, a physics professor at Harvard University, who has been an advocate for flipping the classroom at the higher-education level since he first tried it in 1990. He sees education as a two-step process: information transfer, and then making sense of and assimilating the information. "In the standard approach, the emphasis in class is on the first, and the second is left to the student on his or her own outside the classroom," he said. "If you think about this rationally, you have to flip that, and put the first one outside the classroom, and the second inside." In addition, cognitive science research shows that "active processing" is a key ingredient in learning. Its importance is explained as follows: "learning occurs when people engage in appropriate cognitive processing during learning, such as attending to relevant material, organizing the material into

a coherent structure, and integrating it with what they already know." See also Ruth Colvin Clark and Richard E. Mayer, *e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning* (San Francisco: Wiley, 2008), p. 36. We also recommend Susan A. Ambrose, Michael W. Bridges, Michele DiPietro, Marsha C. Lovett, and Marie K. Norman, *How Learning Works: Seven Research-Based Principles for Smart Teaching* (San Francisco: Wiley, 2010), p. 132. The section describes the research on the importance of using active reading strategies.

20. Stephen Noonoo, "Flipped Learning Founders Set the Record Straight," *THE Journal*, Jun. 20, 2012, http://thejournal.com/Articles/2012/06/20/Flipped-learning-founders-q-and-a.aspx?Page=1 (accessed September 10, 2013). For more information about how to flip the classroom, see Jonathan Bergmann and Aaron Sams, *Flip Your Classroom: Reach Every Student in Every Class Every Day* (Washington, DC: International Society for Technology in Education, 2012).

21. Adam Cotterell, "48 Idaho Schools 'Flip the Classroom' and Pilot Khan Academy Online Learning," September 3, 2013, http://boisestatepublicradio.org/post/48-idaho-schools-flip-classroom-and-pilot-khan-academy-online-learning (accessed September 10, 2013).

22. For more about Flipped Classrooms in South Korea, see Michael B. Horn, "Busan Schools Flip Korea's Society, Classrooms," *Forbes,* March 25, 2014, http://www.forbes.com/sites/michaelhorn/2014/03/25/busan-schools-flip-koreas-society-classrooms/ (accessed April 10, 2014).

23. The story of Joel Rose riffing off this motto for School of One (later renamed Teach to One) is available in Staker, *The Rise of K–12 Blended Learning* (see n. 6), p. 140.

24. "Carpe Diem: Seize the Digital Revolution," Education Nation, http://www.educationnation.com/casestudies/carpediem/ (accessed September 10, 2013).

25. Nick Pandolfo, "In Arizona Desert, A Charter School Computes," NBC News.com, Sep. 22, 2012, http://www.nbcnews.com/id/48912833/ns/us_news-education_nation/t/arizona-desert-charter-school-computes/#.Ui_XjcakqYw (accessed September 10, 2013).

26. Katherine Mackey, "Wichita Public Schools' Learning Centers: Creating a New Educational Model to Serve Dropouts and At-Risk Students," Clayton Christensen Institute, March 2010, http://www.christenseninstitute.org/wp-content/uploads/2013/04/Wichita-Public-Schools-Learning-Centers.pdf.
27. Tom Vander Ark, "Flex Schools Personalize, Enhance and Accelerate Learning," Huffington Post, February 9, 2012, http://www.huffingtonpost.com/tom-vander-ark/flex-schools-personalize-_b_1264829.html (accessed September 11, 2013).
28. Next Generation Learning Challenges, "Grantee: Education Achievement Authority of Michigan," http://nextgenlearning.org/grantee/education-achievement-authority-michigan (accessed April 10, 2014).
29. Agilix, "Educational Achievement Authority (EAA) of Michigan: Disrupting Education in Persistently Low Achieving Schools," case study, http://agilix.com/case-study-buzz-eaa/ (accessed April 10, 2014).
30. Next Generation Learning Challenges (see n. 28).
31. This is based on California data, so it depends on the assumption that the distribution of blended models in California is typical of that in other states. The finding in California is that 59 percent of districts and charters who responded to a 2014 survey reported using A La Carte at the high school level. Fifty-three percent used Enriched Virtual, 32 percent used Flex, and 29 percent used Rotation. Brian Bridges, "California eLearning Census: Increasing Depth and Breadth," California Learning Resource Network, April 2014, http://www.clrn.org/census/eLearning%20Census_Report_2014.pdf. Based on our own observations of the evolution of online learning and the theory of disruptive innovation, we feel confident that these data hold more or less true across most of the United States.
32. The story about CCA is from an interview with Dawna Thornton, director of Commonwealth Connections Academy Philadelphia Center, Connections Learning, May 30, 2014.
33. International Association for K–12 Online Learning, "The Online Learning Definitions Project," October 2011, http://www.inacol.org/cms/wp-content/uploads/2013/04/iNACOL_DefinitionsProject.pdf, p. 7; Watson et al., *Keeping Pace with K–12 Online & Blended Learning* (see n. 3), p. 8.

34. It is important to note that the definition of blended learning is from the perspective of an individual student — in keeping with the notion of moving toward a student-centered learning design — not from the perspective of a school. What would the definition of a blended-learning school be? The annual *Keeping Pace* report offers one definition: stand-alone schools with a school code (as opposed to programs within a school) that deliver much of their curriculum in a blended format and require students to show up at a physical site for more than just state assessments. See Watson et al., *Keeping Pace with K–12 Online & Blended Learning* (see n. 3), p. 9.
35. "What Is Project-Based Learning?," Edutopia, http://www.edutopia.org/project-based-learning/.