THE FIELD GUIDE TO DISRUPTING CLASS

Foreword by

CLAYTON M. CHRISTENSEN

blended

Using DISRUPTIVE INNOVATION to Improve Schools

Michael B. Horn & Heather Staker

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More Praise for *Blended*

"The interest in leveraging technology in schools is growing at a rapid pace. That means district leadership is critical in order to harness these innovative tools as effectively as possible. This book provides superintendents with a blueprint to ensure that blending learning boosts student achievement."

—Daniel A. Domenech, executive director, American Association of School Administrators

"*Blended* not only describes what various blended learning models look like, it carefully lays out a blueprint that school administrators, teachers, and parents can use to make blended learning a reality in their schools. As Horn and Staker clearly state in this book, what we need more than anything in education today is a culture of iteration and innovation to think through and take advantage of this dynamic shift in potential learning models. This important book is a tremendous resource for anyone who wants to take on the significant change we need to make in education. I am going to make sure everyone on my team reads it from cover to cover. Highly recommended!"

—Jaime Casap, global education evangelist, Google

"Our schools need to improve, and technology, if used smartly, can help them do that. This book, building on the authors' previous groundbreaking work in *Disrupting Class*, provides a step-by-step guide for how to do blended learning right. It is a must-read for school officials and educators who want to get good results for their students."

—Joel Klein, CEO, Amplify; former chancellor, New York City Department of Education

"This book takes the innovative work in *Disrupting Class* to the next level. *Blended* unleashes the unprecedented opportunities for teachers and students to design personalized learning pathways for each learner, instead of a one-size-fits all approach. This blueprint propels educators and administrators, policymakers and community leaders to help break down America's traditional education

silos by developing innovative teaching and learning environments that will help students succeed in a technology-driven global economy."

—Bev Perdue, founder and chair, DigiLEARN; former governor, North Carolina

"Michael Horn and Heather Staker, in *Blended*, have perfectly captured the tensions and optimism surrounding the inexorable move toward digital resources in American classrooms. This book will prove an invaluable resource to teachers, administrators and entrepreneurs who have a common mission: to leverage technology as a tool to provide excellence for every child in our country."

—Jane Swift, CEO, Middlebury Interactive Languages; former governor, Massachusetts

"The digital revolution is upon us, and teachers are hungering for ways to better connect with kids where they are, to give them an exceptional education, and to prepare them to succeed in an increasingly fast-paced world. As administrators we must ensure that our teachers are as ready as their students to make the most of a 21st-century classroom. While *Disrupting Class* offered a vision of the emerging digital landscape in education, *Blended* takes things a step further. In reading it we start to see just how, as educators, we're going to exist in this new world and how we can utilize blended-learning strategies to offer our students the education they deserve."

—Terry B. Grier, superintendent of schools, Houston Independent School District

"*Blended* offers a thoughtful and comprehensive examination of the blended learning landscape. While the authors make a strong case for the power of online learning to individualize instruction, they also reveal a yet untapped potential for online learning to empower students to own their education. With *Blended*'s contribution to the conversation, I am optimistic we can move past education that is customized to one that is genuinely personalized—that focuses less on education as delivery and more as discovery."

—JoAnn Bartoletti, executive director, National Association of Secondary School Principals

"With all the calls to reform, improve, or use technology to enhance education, Horn and Staker's approach is refreshing and pragmatic. They succinctly capture

the three great advantages of blended learning: personalization, access, and cost, and support them with examples of what works and how. The authors illustrate how students are eager to take the initiative, to engage and discover resources that build on what they know and guide them to what they should know. Teachers can concentrate on students who need more attention. With this approach, mastery of content is possible for every student. *Blended* charts a course to substantially increase college and career readiness. A great read for education leaders and policymakers alike!''

—Jim Geringer, vice chair, DigiLearn; former governor, Wyoming

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Foreword by Clayton M. Christensen

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Foreword: When Disruptive Innovation and Paradigms Collide

We stand at the vanguard of a shift in education. For a long time, people have shouted back and forth about what ails our schools and have offered differing solutions. Yet there is no panacea. Each camp holds a piece of the solution, but because of the way our schools work, each piece is often diametrically opposed to another. With the emergence of blended learning in our nation's K–12 schools, we now have the opportunity to move beyond what have previously been trade-offs. Allow me to explain by illuminating how the concepts of *paradigm* and *disruption* relate to each other.

Thomas Kuhn's *The Structure of Scientific Revolutions,* which introduced us to the concept of paradigms, is one of the most useful books I've ever read. It summarizes a simple and general model of how bodies of understanding emerge and improve, based on Kuhn's lifetime of studying the history of science. The emphasis of Kuhn's model isn't the initial *starting* of a body of understanding per se. Rather, it focuses on how bodies of understanding improve.

A body of understanding typically starts with a hypothesis about a pattern between one thing and another. The method of improving understanding almost always is an *anomaly*—a discovery of something for which the original pattern cannot account. Anomalies force researchers to revisit the original explanation of causality and adjust it so that it accounts for the new observation as well as the original ones. Through this process of confronting and resolving anomalies that previously could not be accounted for, a body of understanding becomes more and more capable of explaining more and more things.

At some point in some bodies of understanding, causality becomes so broadly understood and accepted that the work of researchers in that field instinctively builds on that understanding. Kuhn called such a body of understanding of causality a "paradigm." It is a model that articulates what is to be observed and scrutinized; the kind of questions that should be asked and how these questions are to be structured and answered; and how the results of investigations should be interpreted.

Researchers rarely question a paradigm because it is so helpful in understanding what is happening in a field. They therefore assume that it is valid and engage in *normal science*. This entails learning how to measure things, defining and characterizing the phenomena, and probing for the boundaries of application of the paradigm. Much of this work entails grouping and comparing. This is how researchers continue to discover anomalies. When they observe an anomaly, they work to adjust and restate the paradigm to accommodate the outlying observation—or they rule that the anomaly occurs outside the boundaries of what the paradigm applies to.

On occasion, however, researchers discover an anomaly for which the paradigm simply cannot account. Researchers often then put it on a shelf somewhere—the academic equivalent of a "cold case." When researchers discover another anomaly the paradigm simply cannot account, it too is similarly put aside for the time being on the cold case shelf. When enough cold cases have accumulated, an enterprising researcher will then study them together and announce, "Hey guys! Look at all of these cold cases! Can you see the pattern across all of them? The paradigm simply cannot be true!"

Often, only a theory that is used in another branch of science in which the original and deepest believers of the paradigm have little background can help reveal the pattern across these anomalies. Because of this, the devout defend the validity of the original paradigm, often to their graves. Indeed, their instinctive toolkit that they used for learning in their branch of science renders many of them unable to see the anomalies that put the paradigm into question. For this reason, Kuhn observed that new researchers, whose training and disciplines are different, typically initiate the toppling of a paradigm and the development of the new knowledge that takes its place.

This process of developing, testing, and toppling paradigms is at work 24×7. It is not an event. Often it takes decades to build and then discredit paradigms.

As an aside, many people use the term "paradigm" for many purposes. Most of them have never read Kuhn's book. They use it in a speech to coronate their opinion into a "paradigm shift," to bolster the stature of an aggressor's intellectual fight with an academic foe, and so on. In my little corner of the world, the term "disruptive innovation" is similarly overused and overapplied by uninformed people who seek justification for anything they want to do anyway.

THE RELATIONSHIP BETWEEN STRATEGY AND INNOVATION

Much of the energy expended in normal science entails studying trade-offs, which typically can be displayed as a two-dimensional graph: to get more of one thing, on the vertical axis, you get less of the other, measured on the horizontal axis. The relationship between trade-offs, called an "efficiency frontier," can be linear, convex, or concave. Putting a satellite into orbit entails trade-offs, for example. Lifting it into a low orbit makes it faster in telecommunications, but the satellite needs to be small, lightweight, and focused on a single mission; a satellite in a high orbit can be bigger and have multiple missions, but it is much more expensive; and so on.

A decision to position one's company or products on a point on an efficiency frontier between trade-offs such as these is what my friends Michael Raynor and Michael Porter call "strategy." Strategy entails trade-offs. In education, a few of these trade-offs might be: Should the model of teaching be one-way (lecture) or two-way (discussion)? Should our model be based on personal tutors or teaching students by the batch? Should we build large schools to take advantage of economies of scale, or should we prefer smaller schools with fewer students per teacher? These are strategic choices along a theoretical frontier. After a strategic choice has been made, the types of innovations that educators focus on are what we call "sustaining innovations." These types of innovations make good products better. They help you to more effectively deliver the strategic choices you have selected.

Paradigms, such as those in satellite design and placement, don't dictate an optimal spot on the trade-off frontier. Rather, they define the trade-offs to be discussed and the metrics to be used in evaluating answers. In education, the paradigm frames things like the student-to-teacher ratio or the trade-offs between

project-based learning (engagement) and lecture-based learning (knowledge absorption). Normal science rarely questions the existence of these trade-offs.

Disruptive innovation occurs when an entrepreneur or technologist figures out how to break a trade-off by giving more of one without requiring us to accept less of the other. Often, breaking a trade-off initiates the toppling of a paradigm. A key reason why disruptive innovations are so adept at toppling paradigms — and industry leaders — is that sustaining innovations are static. They make the best of trade-offs that were decided in the past.

Those with the perspective of a disruptive innovator initially accept the established trade-offs in the old paradigm. But they see that the trajectory of technological improvement is faster than what customers are able to use. As the performance of technology moves from "not good enough" to "more than good enough," the trade-offs are broken. The intersection of the trajectories in the theory of disruption dynamically releases the constraints that create trade-offs.

The trajectory that becomes disruptive always begins among undemanding customers at the bottom of sectors. In the vein of education, most teachers like me conceded early on, at least verbally, that the delivery of lectures online would, over time, disruptively surmount traditional in-class lectures. But we have collectively believed that it would be impossible for online learning to emulate the discussion in a senior research seminar in high school or college or case-based teaching at the Harvard Business School. In the onslaught of disruption, we have seen these as safe havens for traditional teaching.

Now, however, enter my friend Espen Anderson, professor at the Norwegian School of Management in Oslo. Espen is breaking trade-offs in classroom learning. The arrangement is disruptive and ongoing. Espen needs to be in Boston for medical reasons as I write this, even as his students need to learn through the case method in Oslo. Espen's solution? He tied his signature bow tie onto a robot in the Oslo classroom, taped his Apple iPad on top of the robot's neck, and brought his wireless joystick for the robot to Boston. Espen's students sit in assigned seats in Oslo, and each seat has three buttons. One signals to Espen, "I want to make a comment in support of the last comment." Another signals, "I disagree with that last comment." The third signals, "I have a comment on a different topic." This allows Espen to call on a student who has figuratively raised his hand in the air and guide the direction of the discussion. Espen can then figuratively walk to the whiteboard to summarize what the students are saying, as well as move to a

student he has called upon and respond not just verbally, but with body language, to what the student says.

I tell his story not to say that K–12 education will look the way his classroom looks in the future, but to illustrate how because the process of technological improvement improves at a faster rate than people can use the improvement, Espen is showing us that trade-offs that historically were implicit in some of the paradigms of education are now being broken.

Here is a way to frame the process: Time is a way of preventing everything from happening at once. The future and the past both exist in the present, but they are not evenly distributed around the world. (William Gibson, Sean Carroll, and others have had similar thoughts.) Is Espen Anderson's classroom in the future or the present?

If we simply wait for the future to become the present—that is, if we wait until data about new ways to teach and learn arrive on the scene—data will continue to joust with other data, and little will change. This is so because without a compelling theory as a foundation, your data will not have a louder voice, nor more compelling logic, than my data will have. The basis of action and change is theory, not data.

Many elements of the paradigm about teaching and learning have served portions of society well in the past. Now we have a theory—disruptive

innovation—that gives meaning to the data that are emerging. The data from classrooms, including Espen's, in many parts of the world are declaring that trade-offs in education are being broken.

I can see that in my past as a teacher, I was constrained by trade-offs. My innovations were sustaining ones. I have been a good teacher for students who thought as I did or had experiences like mine. I am mediocre, at best, in teaching students who frame the world differently. Online learning offers the chance to custom-deliver learning opportunities matched to each student. To have intellectually stimulating discussions with my students, I had to keep enrollment down. I always thought that the teacher taught and the students listened. No longer. Stimulating discussions among large numbers of students in widely differing locations is now possible. Students can teach one another in addition to teachers teaching students. We are all learning how to learn and teaching how to teach. And thank goodness. As Eric Hoffer remarked, "In a time of drastic change it is the learners who inherit the future. The learned usually find themselves beautifully equipped to live in a world that no longer exists."

This book, by my colleagues Michael Horn and Heather Staker, is a marvelous description of how many of the trade-offs in teaching and learning are being broken. Instead of our needing to accept less of one thing in order to get more of another, we can now expect with confidence that we actually can achieve more, period. As the capability of online learning moves up the trajectory of improvement and obviates more and more trade-offs, blended learning preserves access to the best of in-person teaching and learning as we navigate disruption. Blended learning makes the best of the old and new paradigms available to all of us who want to learn. And this book is designed to help teachers, school leaders, superintendents, and parents learn how to implement blended learning today and not stand on the sidelines waiting for the future to emerge somewhere else.

Clayton M. Christensen
Harvard Business School

Acknowledgments

After the publication of *Disrupting Class*, a fortunate thing happened. Teachers, school leaders, policymakers, parents, entrepreneurs, funders, philanthropists, technologists, corporate leaders, college professors, and many others reached out to us. We all shared one common goal: to transform our education system into a student-centered one that allows all children to fulfill their human potential.

Many of these people worked in education; many did not. Many agreed with our vision and wanted to connect with our growing network of innovators; others did not agree and wanted to teach me. Thanks to their outreach—and the thousands of phone calls, meetings, and school visits I've been privileged to partake in with people around the world—I've learned a tremendous amount. I'm inspired daily by the passions of people who work to make education better for students worldwide.

In our work at the Clayton Christensen Institute, a nonprofit and nonpartisan think tank dedicated to improving the world through disruptive innovation that I cofounded, we've been able to leverage this access to document what we've learned through our case studies, white papers, articles, blogs, speeches, workshops, and our Blended Learning Universe, a database of blended-learning school profiles. None of this research would be possible without our generous donors. In this book, we bring together all that we've seen and learned with our theories of innovation to help you design blended-learning environments that move our education system toward a student-centered one.

After *Disrupting Class*, I always wondered how one writes a second book. The answer for me has been to have an amazing coauthor and thought partner. Heather Staker is brilliant, passionate, and perhaps the most productive person

I have ever known. Had it not been for her skillful writing, vision, and research, this book would not have happened.

We have been fortunate to have an amazing team at the Christensen Institute over the past seven years who contributed to this book. Katherine Mackey was our first employee and wrote several of the case studies that galvanized this work. Meg Evans illuminated challenges on the ground that schools adopting blended learning experienced and made our theory-based work more tangible. Anna Gu dug deep to check our facts and pinpoint sources. Cathleen Calice carved out the time for the thousands of meetings that inspired this book, as well as the time to write it. Tom Arnett, Charity Eyre, Julia Freeland, and Mike Lemaire's research all helped shape this volume. My dear friend and Christensen Institute board chair Gisele Huff has been an instrumental sounding board and guiding light through the years and helped bring this to fruition. Ann Christensen and Hayden Hill make our work more impactful. Michelle R. Weise helps connect our work to the evolving reality of higher education. And I remain indebted to and inspired by my mentor, Clayton Christensen, who continues to teach me in ways big and small.

I'm lucky to have a lifelong partner in my wife, Tracy, who feels as passionately about my work as I do and who just as earnestly wants us to succeed in transforming schools around the world into student-centered ones that can personalize for each student's distinct learning needs. As we welcome our daughters into this world, her pushing and prodding, editing, cheerleading, and love propel me forward. I dedicate this book to her.

Michael B. Horn
Lexington, Massachusetts

In 2010 I began researching the emergence of blended learning in American schools. At the time I had no idea that what was then a small project—a joint effort between the Clayton Christensen Institute and Alex Hernandez and Eric Chan from the Charter School Growth Fund—would change my personal life in a big way. A few months into the research, I stumbled upon Acton Academy, a blended school that Jeff and Laura Sandefer founded in Austin, Texas. I was so impressed with the school that I persuaded my husband to move from Honolulu, Hawaii, to the heart of Central Texas so our five young children could enroll.

Today, each time that I visit a blended school, I have one question in my mind: Is this another school to which we would want to send our *own* children? I am hopeful that over the next decade, the answer will increasingly be yes.

I am grateful to Michael Horn, whose development of *Disrupting Class* sparked a far-reaching conversation about how to recenter learning around individual student needs. He is widely acclaimed for his intellect and eloquence, but those who work on his team know that he is equally gifted as a manager and mentor of people.

Several individuals opened doors for me that have led to opportunities to live up to the desire I feel to help improve schools and the education system. These people include Clayton Christensen, Pete Wilson, Salem Abraham, Beth Ann Bryan, Sari Factor, Francie Alexander, Roger Porter, Richard Wallace, Leilani Williams, and the Brain Chase team.

Many teachers and child whisperers were an invaluable support to our family this year. Special thanks to Miranda Livingston, Andrea Hall, Carley Clayton, Monica Fisher, Caroline Rudolph, Kaylie Dienelt Reed, Anna Blabey Smith, Samantha Simpson, Terri Dove, DeeAnne Paulson, Debra Wissman, and Janelle Black, who teach, guide, and love many Austin children, including my own.

I am inspired by my parents, who regard teaching as among the highest of vocations. L. Whitney Clayton, my father, gave up his successful law practice to become a minister and teacher. Kathy Clayton, my mother, served for thirty years as a school teacher, facilitated student-centered learning in her classrooms well before the concept was familiar, and in her poetic style wrote a beautiful book about it that inspired my thinking for this one.

Tate, Savannah, Audrey, Henry, and Grayson Staker are responsible for the passion and urgency I feel in helping to articulate the case for making schools not only more effective by society's standards, but also more joyful and nurturing from a child's point of view. Mothering them is the greatest opportunity of my life. Allan Staker is my forever companion and love. He continuously strengthens me, encourages me, and reminds me that there is no shortcut to adventure. I dedicate this book to him.

Heather Staker
Austin, Texas

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About the Authors

Michael B. Horn is a cofounder of the Clayton Christensen Institute for Disruptive Innovation and serves as the executive director of its education program. He leads a team that educates policymakers and community leaders on the power of disruptive innovation in the K–12 and higher education spheres through its research. His team aims to transform monolithic, factory-model education systems into student-centered designs that educate successfully every student and enable each to realize his or her fullest potential.

In 2008, Horn coauthored the award-winning book *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns* with Harvard Business School Professor Clayton M. Christensen and Curtis W. Johnson. *Newsweek* ranked the book fourteenth on its list of "Fifty Books for Our Times." Horn has written several white papers about blended learning and, with Frederick Hess, is coeditor of the book *Private Enterprise and Public Education*. He has also written articles for leading publications such as *Forbes, Washington Post, Economist, Huffington Post*, and *Education Week* and, along with Brian Greenberg of the Silicon Schools Fund, leads "Blended Learning 101," a five-part series of free online content in partnership with the Khan Academy.

Horn testifies regularly at state legislative sessions and is a frequent keynote speaker at education conferences and planning sessions around the United States. *Tech & Learning* magazine named him to its list of the one hundred most important people in the creation and advancement of the use of technology in education.

In addition, Horn serves on a variety of boards, including as an executive editor of *Education Next*, a journal of opinion and research about education policy, and on the boards of Fidelis Education and the Silicon Schools Fund. Horn is also a

member of the Education Innovation Advisory Board at Arizona State University, the Digital Learning Advisory Council to the Board of Education in Massachusetts, and the advisory committee for the Hechinger Institute on Education and the Media at Teachers College, Columbia University. Horn holds a BA in history from Yale University and an MBA from the Harvard Business School. He was also a 2014 Eisenhower Fellow and studied the education systems in Vietnam and Korea.

Heather Staker is a senior research fellow for education practice at the Clayton Christensen Institute for Disruptive Innovation. She has appeared on radio and television and in legislative hearings nationwide as a spokesperson for blended learning, competency-based learning, and student-centered design. Major publications Staker has authored or coauthored include "The Rise of K–12 Blended Learning," "Classifying K–12 Blended Learning," and "Is K–12 Blended Learning Disruptive?"

Named by Scholastic as one of the Five People to Watch in Education in 2012, Staker has written articles for *Education Next, Deseret News,* and *THE Journal,* as well as appeared frequently as the keynote speaker at education and innovation conferences across the country. Staker is also the co-producer of Brain Chase, a 6-week worldwide learning adventure disguised as a massive treasure hunt for K–8 students during summer vacation.

Prior to the Christensen Institute, Staker worked as a strategy consultant for McKinsey & Company, served as a member of the California State Board of Education during Governor Pete Wilson's administration, taught U.S. history as a teaching fellow at Harvard University, started a co-op preschool, and marketed Oil of Olay for Proctor & Gamble. She holds a BA in government from Harvard University and an MBA from the Harvard Business School. She is happily married to Allan Staker, and together they are raising five spirited children.

Introduction

You walk into a school that is clean and painted brightly. Student artwork hangs from the walls, and the library is well stocked. The teaching staff works hard, and administrators keep the school running in an orderly way. The school provides students with computers, sports, and field trips. Yes, many schools in the world struggle mightily, particularly in the inner city; documentaries such as *Waiting for Superman* and *A Right Denied* have highlighted heartbreaking public school blight. But certainly some schools are good. And if you're like most parents, you believe that the schools your own children attend—whether public or private; urban, suburban, or rural—are preparing your children well.[1]

This book is about the blending of online learning into schools. It is intended to be not only a resource for those wanting to make significant changes to their schools or who are already thinking about blended learning, but also an eye-opener for people who feel content with what they have. Schools are approaching

the tipping point in a digital transformation that will forever change the way the world learns. If online learning has not already rocked your local schools, then it will soon. The authors of *Disrupting Class* (including Michael B. Horn, a coauthor of this book) made that prediction in 2008, when they forecasted that by 2019, 50 percent of high school courses would be online in some form or fashion.

Years later that prediction continues to appear accurate—some would even say conservative.[2] People may debate the timing, but we believe the more interesting question is whether the indisputable emergence of online learning across elementary, middle, and high schools is a good thing. Is our system devolving into a hopelessly impersonal, sci-fi-type automation, or is the surge of students learning online a positive thing? And how can we ensure the latter?

PATTERN OF DISRUPTIVE INNOVATION

Asking whether online learning is a good thing is much like asking whether email, Target, and TurboTax are good things. The U.S. Postal Service may not be a fan of email, but most everyone else has found that email makes communication faster, more convenient, and more affordable than mailing a letter with stamps. Macy's may not love Target, but countless consumers enjoy improved standards of living because of the affordability of discount retailers. H&R Block and other tax accounting firms rue the day TurboTax was born, but many individuals and small businesses consider TurboTax a godsend.

Email, discount retailers, and TurboTax are all examples of what Professor Clayton M. Christensen of the Harvard Business School calls "disruptive innovation." Although disruptive innovation may not sound, on first hearing, like something educators would want to embrace, it offers many benefits. The term refers to products and services that start in simple applications at the bottom of the market for those without the wealth or expertise to participate otherwise in the market.[3] For example, before TurboTax came along, most people struggled with a pencil and calculator to file their own returns because they could not afford to pay a professional tax accounting firm to do it for them. But Intuit's TurboTax software is "disrupting" the current, or incumbent, system made up of professional tax firms. It gives millions of people who cannot afford a professional tax firm a simple, affordable way to prepare their returns accurately with professional guidance.