

Introduction

Congratulations, your school has just purchased a cart housing twenty-four tablet computers. Your principal or headmaster wants you to roll it right into your classroom and start innovating—tomorrow.

Or you are a fairly advanced edtech teacher, but your career is stalled in second gear. Maybe you were recently passed over for an instructional coordinator position. While your colleagues know you are keen on using new gadgets with pupils, they have absolutely no idea how innovative you really are, because you are uncomfortable being in the spotlight. You could be a positive force for change, but you secretly fear that it will seem as though you are showing off, making your colleagues' practice seem antiquated by comparison. (And maybe it is!)

Perhaps you read all the blogs and belong to several online groups specifically geared to edtech enthusiasts. There is so much amazing stuff out there! Yet, if you are honest with yourself, you might realize that you tend to hop from gadget to gadget and app to app. While your students may be engaged in learning, you may have allowed your excitement over the *new new thing* to take precedence over a meaningful connection with your curriculum.

Or again, maybe you are an edtech professional development expert. Although you believe you have found your calling, you find it tricky to work with educators who are all over the map when it comes to edtech integration.

How can you possibly design workshops and other events that will be valuable for everyone, regardless of where they are on the TechnoTeaching continuum?

Or maybe you are a school leader. Many members of your staff are technology enthusiasts. You have some funds that you could dedicate to purchasing new digital equipment. But where to begin? So far, nobody has convinced you that the tools in question will improve student learning or test scores. Nor has anyone shown you a proposed budget.

Sound familiar?

OUR MISSION

Our mission in writing this book is to reach out to every teacher who is an idealist at heart, but isn't sure how to reenvision his or her practice in the digital age.

It's for every teacher who has had everything go haywire when teaching a lesson involving educational technologies.

It's for every teacher who wants to level the playing field for his students, empowering them in twenty-first-century terms, but has barely enough money in the budget for crayons and construction paper.

It's for every teacher who wants to innovate with tech tools, but keeps hearing from those around her that it's impossible to do it well. She not only wants to do it brilliantly, but she'd also like to share her success stories with others, beyond geographical boundaries. She realizes that today's students are global citizens (many are multilingual) and wants to give them every opportunity to engage with peers all over the planet.

It's for every formerly well-respected master teacher who now feels like a dinosaur waiting for that asteroid to strike. He knows that change didn't happen overnight, yet somehow the digital revolution feels so sudden.

If you are holding this book in your hands, you have come to the right place. This book is for *you*.

Our goal in writing this book is threefold. First, we aim to show how all teachers can kick their practice up a notch by integrating technology with

best practices into teaching and learning. We call this *TechnoTeaching*. This approach is for every teacher, regardless of whether you are a novice who has made only a few brave forays into teaching with technology, or you are at the vanguard of promoting pioneering twenty-first-century practices in your community (and perhaps even the larger world).

This approach will also help U.S. teachers align their instruction with the Common Core State Standards (CCSS). Under these guidelines, every teacher needs to incorporate literacy instruction into every subject area. Also, the creative and effective use of digital media is no longer optional; beginning in kindergarten, children are now expected to use new tools both to become literate citizens and to broaden their understanding of the world. This book will help you hone your skills. It will also help you prepare your students to be “college and career ready in writing, speaking, listening, and language,” consistent with CCSS guidelines.¹

Second, we aim to show you how to help narrow the persistent race- and income-based achievement gap in today’s schools by giving *all* students the opportunity to use multimedia and communicate what they have learned with others near and far. We have all too often seen how budget cuts affect low-income schools. Many children are denied access to the tools they will need to be successful members of society in twenty-first-century terms. We will also suggest ways for you to provide rich language experiences, such as online vocabulary development tools and multimedia programs, for your pupils who are learning English.

Third, we strive to help narrow the digital divide by providing all students with an equal chance to succeed in our technological world. Research shows that children in more affluent communities not only have a plethora of digital tools and gadgets to experiment with, but they are also shown how to use them—not with drill-and-practice routines (as in lower-income schools), but in real-world applications like solving geometry problems, designing fashions, or flying an airplane (virtually).² The question of how to redress these types of inequities is foundational to the ideas we present in this book. If you agree, then read on.

WHAT HAPPENS WHEN TWO EDUCATORS MEET IN CYBERSPACE?

How we “met” is testament to how our lives are impacted by advancing technology. Nicole—an award-winning multimedia teacher, school leader, and coach from Britain—was interested in expanding her client base as an online consultant. She decided to post a biography on LinkedIn to see what would happen. Julie—an experienced teacher, multimedia designer, and teacher mentor—was keen on making links outside of the United States to learn about education in different cultures. We made sure our top halves looked presentable, in true news anchor style, and “met” on Skype (both pretending that we did this every week).

We discovered a lot of common ground, despite our differences. We talked about teachers, professional development, the economy and its impact on schools, and how eager teachers are to update their practice. After our chat and several e-mail exchanges, we realized that it doesn’t matter where you are on the globe or what experience you have: teaching in the twenty-first century is both exciting and problematic.

What was interesting for us was the fact that we discussed only education, not family or friends. This came later. We were both focused upon the same subject. We wanted to work out a way to become smarter at integrating digital media into educationally rich projects. We were both often dismayed by what passed for innovation in schools. To our thinking, there was too much hype about cool new tools and how quickly children figure out how to use them, without any serious regard for the nature of schools and what decades of research (along with current research on the brain) have taught us about how children learn.

We talked it over and decided to find a way to join forces. We believed that being from different cultures, as well as having come of age at different times in history, would be a boon. Nicole was born in a time of great technological advancement, while Julie grew up thinking 33.3 rpm Beatles albums were the greatest invention ever. In Nicole’s time we have created the International Space Station, while Julie remembers the excitement of the *Apollo 11* space

flight that landed men on the moon. Despite these differences, we have one big thing in common: an abiding passion for helping all children succeed as learners. We also share a passion for helping teachers and administrators use every tool at hand to create schools in which teaching and learning can flourish. We are both at times puzzled by what we see in today's schools and society at large: techno-blur. Learning without frontiers? E-learning? Digital studies? Transmedia? The jargon alone is bewildering. We wonder how it all fits into our vision of how schools need to evolve to stay current (and relevant) in the digital age.

Above all, we wanted to use our combined knowledge, experience, and skills to help teachers whose attempts at edtech integration feel like a white-knuckle rollercoaster ride.

So, where to begin?

THE CHALLENGE

We had lots of ideas to start with. But one idea kept jumping to the forefront: *all* teachers use technology to some degree, but not all teachers are where they want to be. *They are not yet TechnoTeachers*. Technology is there in the classroom, but for some it is a priority, for others an add-on. Some teachers use it for impact in their lessons (student engagement or lesson criteria). Some use it for bells and whistles. Some try to hide it in cupboards. Many get sidetracked by focusing on learning the next new thing in digital tools. Many do not stop to reflect how technology is (or is not) helping students as learners. They are not sure of their role as a member of a global community.

We concluded that there were three elements to using educational technology well. The first element is *Skills & Tools*. Being a *skill*-ful teacher means knowing how to use a variety of digital tools and gadgets—or, as importantly, knowing where to go to learn how to use them. These Skills & Tools might include editing and manipulating photographs, creating videos and documentaries, using interactive whiteboards, finding and archiving digital resources on the Internet, and creating digital books using online tools. Teachers who

are tech savvy make it a point to stay on top of “the latest,” whether that involves updating the operating system on their computers or learning their way around Google Docs. The element of Skills & Tools also includes being able to access resources and support systems for students that can help *them* learn new skills with the tools that are within their reach.

The second element is *Content*. What subject areas form the basis of a teacher’s curriculum? What ideas are administrator’s or teacher professional developer’s trying to get across? Content refers to essential subject matter, the gist of teaching and learning throughout the school year. Content is substrata. The big ideas that teachers aim to get across during a given school year. Without Content, using edtech can result in “fun episodes” in learning random information.

But without a positive attitude toward teaching and learning with digital tools, the first two elements are all for naught. What good are the Skills & Tools if a teacher uses them only to check the weather app on his iPad or play *Star Wars* games? What good is content knowledge in the twenty-first century without a willingness to set aside faded lecture notes and have students launch their own investigations using a wealth of online resources? Thus we came up with what we call *Mindset*, the third element of TechnoTeaching. Mindset refers to being willing to be a pioneer (and even a bit of a guinea pig). It means being willing to give up on perfection and teach a lesson involving a new skill *at the same time* that students are learning it. It means being willing to set aside traditional ways of doing things even when it’s scary. It means reaching out to colleagues so no one is ever out on a limb all alone. It means taking risks and engaging in continuous learning and reflection so that students are prepared to assume their role as global citizens.

Coming up with the three elements of TechnoTeaching led to a Eureka moment. We saw in a flash that regardless of what kind of technology is being used, or how much of it, the most skillful teachers—the ones making the greatest impact on student engagement and learning—are *able to weave together all three of these elements*.

More typically, the elements of TechnoTeaching play out unevenly. A teacher weak in Mindset (that grumpy, cynical one in the corner) might work in a very

well-resourced school with an excellent professional development program (Skills & Tools and Content). The enthusiastic (Mindset), geeky (Skills & Tools) teacher might not plan his lessons quite as well as he should (Content). Or the department with the very detailed schemes of work (Content) might have one camera for the entire school and be pretty indifferent about the digital revolution (Mindset). What is the implication here? How can this book help?

Another aspect of Skills & Tools, Content, and Mindset to bear in mind is that your students also have strengths and challenges in these areas. We have all worked with the child who is a whiz at learning how to use new gadgets, but enjoys them for their own sake rather than as a learning tool. Other children have great ideas for podcasts but do not yet know how to create them and post them on the class website. Still others have much to offer, but have attentional issues or need help learning to share what they know when working on a project with peers in small groups. In a nutshell, we're all in this together.

OUR SYSTEM

Although we confess to being a bit starry-eyed about this brave new world, we realize that many hurdles await teachers and administrators who aspire to become TechnoTeachers. Many of the challenges involve Skills & Tools, Content, and Mindset. Giving and/or receiving training for building a set of *skills*, based on having opportunities to play around with digital *tools* in this era of rapid change, can be daunting. How do you find time? What about the fact that the tools themselves seem to change hourly (e.g., new operating systems, new ways of storing and retrieving data)?

Also, making sure that the *Content* is driving the use of technology is trickier than it sounds. Many school programs have been criticized for letting “the tail wag the dog,” allowing the cool factor to trump learning.

Mindset may be the stickiest wicket of all. Perfectionists need to learn to accept (if not embrace) occasional failure in order to get to the next level; skeptics need to try on a bit of optimism; lone wolves need to build relationships

with supportive colleagues; and traditional teachers need to let go sometimes and allow their students to take the lead.

What this book offers is a systematic plan that teachers, school leaders, and staff developers can use to make sure integrating edtech is done right. If you go through the system, you will be tapping into better practice. We've incorporated three universal elements that you can use no matter what gizmo comes along; we designed our system to withstand the test of time.

Our system, drawn on our collective experience mentoring and helping hundreds of teachers to integrate technology into their curriculum, builds incrementally, brick by brick. We begin with your best unit. Then we show you how to plan a total of six (or more if you like) units over the course of the school year. Next we ask you to challenge yourself further through short, dynamic lessons that may take as little time as one class period. We let you know when it is time to reach out to the global community. We provide forms to help you track and then reflect on your progress as you plan ahead for future years.

Throughout, we offer a framework to help you understand the extent to which you are truly *integrating*, rather than merely *using*, new tools. The two approaches are as different as the sea and the stars. While using new tools might win you instant success, *integrating* new tools is what counts. By weaving them into your practice in ways that deepen learning, you will have the most impact as an educator. We will show you how.

To make things more concrete (and fun!) we will describe the joys and sorrows of three fictional teachers as they adopt our system. These teachers—archetypes of teachers we have worked with—have different worldviews, years of experience, and familiarity (and levels of open-mindedness) about integrating new tools into their lessons. Along the way, we will put on our mentor hats and give them advice based on our combined thirty-plus years of helping teachers use more technology in different types of schools, from low-income to affluent settings.

We hope much of what we show you will seem like the times when you and a colleague have a quick, encouraging chat in the corridor, or over a cup of coffee. In some cases, we also imagine this book will be like a professional

development event that gives you new ideas for improving your own practice, as well as ways to lead the change.

We imagine that you already know the ins and outs of the subject area guidelines for your particular teaching situation. Similarly, this is not a how-to book for using new tools; simple Google searches and YouTube tutorials will lead you to more up-to-date information than we could ever include between the covers of this guide. We also assume your school leaders have already developed safety guidelines for Internet and social media use in your schools, that you know these policies, and that you have created a positive space for students and have had open, honest discussions about digital citizenship. Key conversation topics include online etiquette, the dangers of cyberbullying, and the importance of maintaining a positive online presence. As many people have discovered, once they have posted a photo or message to a social media website, it is nearly impossible to erase.

THE HUMAN ELEMENT

Again, in the non-starry-eyed department, we acknowledge the downside of living in the digital age. In her book, *Alone Together*, for example, clinical psychologist Sherry Turkle sends a piercing message about where we are headed as a culture, given the strong attachment we have to our devices. What have iPads and iPhones done to our human relationships? Do we spend enough time in face-to-face communication? Are adolescents' identities being shaped by how others perceive them in a virtual space as opposed to real life ("RL," in cyberspeak)? Society has reached a point, Turkle says, where "[W]e fear the risks and disappointments of relationships with our fellow humans. We expect more from technology and less from each other."³

Several other educators and psychologists are also fearful about what new gadgets are doing to our brains and our ability to process complex information. Others lament the fact that our children are so enamored of various iPad apps that they have come to think of life as one big collection of them. Still others offer advice on how and when adults should pry children away from their

devices (not to mention advising parents on how important it is to put down their cell phones and talk to their children).⁴ Where will it all lead (we ask, as smartwatches become the new craze)? What sorts of boundaries do we need to create to keep the human element front and center even as we encourage children to use new tools in rich and rewarding ways? These are some of the questions that have grounded our thinking. They have led us to emphasize the human element of using new tools. While other authors may hyperventilate over new devices, we get excited about how technology-enhanced experiences, like Skyping with peers in another country, can open doors for children, helping them understand the interconnectedness of the world.

While other authors offer you a one-size-fits-all formula to becoming a techno-star overnight, we show you how to reflect on your practice and take it up several notches over time. We offer you step-by-step guidelines for infusing your best curricular units with new technologies, then using these units to anchor the thirty-six weeks of your school year.

By the time you have finished reading this book, you will have learned how to reach deep inside yourself (with help from your colleagues near and far) to become the type of thoughtful, innovative teacher you always wanted to be.

HOW TO USE THIS BOOK

In chapter 1 we begin by sharing the theoretical underpinnings of this book. Beginning with our six basic beliefs about how to help teachers incorporate edtech into their practice, we explain the research and best practices that have grounded our work.

Helping you situate yourself within the TechnoTeaching world and figuring out where you want to go is the aim of chapter 2. We also introduce you to our three fictional TechnoTeachers, archetypal characters who represent a composite of many teachers we have worked with over the years. TechnoWhy? Melissa is a history teacher in a high school in Newport, Rhode Island. Once a closet Luddite, Melissa is finally ready to take the plunge into the digital age, mainly because she realizes that however gifted a teacher she may be, if she

does not begin integrating new technologies into her teaching she will be doing her students a major disservice. Her students are skilled and ready to go. While Melissa is an expert in her content, she needs a systematic plan to help her focus on integrating digital tools. She needs to open her mind to new possibilities including those that allow her students the opportunity to take the lead on twenty-first-century projects.

Then there is TechnoOK Zayid, an émigré from Mumbai to Bournemouth, England, who teaches middle school English. Zayid is naturally good with gadgets and loves trying out new apps and software with his students and his two sons. The only problem is that his approach is often too spontaneous and impulsive. It is not sufficiently grounded enough in content to have a significant impact on student learning. He needs a plan to connect his love of using new tools and gadgets in the classroom with his English curriculum and his students' learning profiles (including many English language learners). Can he use iPads to help his students access apps that will be a boon for their writing? Can he adapt software for creating graphic organizers for students who need help structuring a story or article? How can new tools deepen teaching and learning for the adolescents in his classes?

Last, meet TechnoYes! Jasmine, who teaches fourth grade in Québec City. Jasmine has a pioneer's zeal for innovation in her classroom. She was the first in her school to use Skype. She was the first to bend the capabilities of word processing software to improve students' writing. She was the first to use assistive technologies with students with individual needs. What Jasmine has yet to figure out, though, is how to tell the world about her innovative teaching methods. She is ripe for taking on a leadership role both inside her school and beyond, virtually. She is also ready to introduce her students to the online world. She believes that by connecting with peers around the world, her students will be able to reflect on who they are, what is important to them, and how other children see the world. But first she needs a plan to open her students' eyes to the world around them.

In chapter 3, we begin the process of deepening your practice, by designing a single six-week project that we call a Stellar Unit. We show you how our

TechnoTeachers (and you) can take each of their best units and infuse them with new technologies for in-depth, student-centered learning. The process is somewhat messy, just as it is in the real world. We show you how to plan and refine your own technology-rich Stellar Unit.

Taking it a step further, chapter 4 shows how our teachers hunker down and “anchor” their year by mapping out four more Stellar Units using a blueprint model. You will see how our three TechnoTeachers, who are not accustomed to planning this far in advance, take on what we call the “180-Day or 36-Week Challenge.” You will also see how they reach out to technology coordinators and instructional technology (IT) specialists for ideas and extra resources.

As a complement to long-range planning, in chapter 5 you will find ideas designed to stretch your TechnoTeaching Skills & Tools, Content, and Mindset. We offer several short-term projects to complement your Stellar Units. Some of them can be completed in a single forty-five-minute class period. You will see how our three fictional teachers are presented with a “dare” to select one of our nine “Dare Devil Missions.” Each one rises to the challenge. Then we turn the spotlight on you. Which Dare Devil Mission will be the best fit for you and your students?

We will also dare you to integrate a seasonal short project into your curriculum, such as “Theater and the Arts” and “Holidays Around the World.” These projects also involve experimenting with tools such as Google Maps, multimedia software, and astronomy websites.

But is it enough to be a star in your immediate surroundings? Is it enough for your students to work within the confines of their community? Not in this age of globalization. You can help your students become global citizens through the Internet and by using telecommunications tools. In chapter 6, we show you how. Grounded in the theories of international researchers such as Howard Gardner and Marcelo Suárez-Orozco, we explain how connectivity among children and adolescents can be a positive force, helping to eradicate prejudice and cultural misunderstandings. As Sir Tim Berners-Lee, the inventor of the Internet, has expressed it: “Although you can look at the Web as a technical system, perhaps

a more reasonable or useful way is to look at it as a system for connecting humanity through technology.”⁵

It can be frustrating to create an edtech plan and then not be able to find the resources you need (both financial and human capital) because of budget cuts and other types of financial shortfalls. In chapter 7, we show you how to go after the resources you need to realize your vision. From justifying a budget, to appealing to big business, to writing a grant proposal, we have several ideas to help get you and your students get up and running, if you are willing to be creative and, in a nutshell, *ask*.

As John Dewey and others have pointed out over the last hundred years, excellence in teaching also involves taking the time to reflect on your practice. It is easy to get caught up in the momentum of teaching, leading professional development sessions, or being a tech coordinator with no time to record your lessons through journaling or taking photographs. In chapter 8, we offer several tools to guide your reflective process, assess progress made toward your goals over the year, and make plans for refining your units for the next year.

We begin and end this book with what we call our TechnoTeaching Manifesto (yes, a very formal word, yet we think it fits). It captures our core beliefs as well as the structure of this book.

- ***Be bold.*** *Be a dare devil*—no matter where you are on the TechnoTeaching continuum.
- ***Build on what you know and care about.*** The subject matter you know and are passionate about provides you with the best way to begin your TechnoTeaching journey (i.e., designing your Stellar Units).
- ***Plan ahead.*** Not simply planning for the next unit, but mapping everything out for an entire school year (i.e., creating a TechnoTeaching blueprint) will reward your time and effort tenfold.
- ***Create a support system.*** While it is great to have cool gadgets and goodies at your fingertips, your best resource is human capital—the educators you have access to, near and far, who can become part of your

support system, with you giving back by sharing what you have learned (yes, even the disasters).

- **Think globally.** Children growing up in the digital age (whether we call them Generation Zs, digital natives, or millennials) are living in a vastly different world than the one in which we were raised. By teaching them well, and helping them develop a mindset that extends well beyond their immediate world, we can help them become actors on the global stage.
- **Forge ahead.** Not all of your colleagues will embrace the fact that you are working hard to retool your practice. Change is harder for some people than others. (Just look at some of the characters in *Downton Abbey* after World War I—longing for the way life used to be but would never be again.) Keep forging ahead anyway. Even better, try to win over the tech-averse people in your life and get them on your side.
- **Be a leader.** Working at the forefront of technology integration will set you apart. It can be a springboard for you to become an influential educational leader and help motivate you to keep learning, no matter what the “next new thing” is.
- **Have faith.** You are smarter and more resourceful than you think. And once you gain momentum as a TechnoTeacher, there will be no stopping you. Have faith in yourself. We do.

We aim to take you by the hand, every step of the way, pausing to give you that much-needed time to evaluate and personalize the approach. We will help you see what the next level is and how to create goals. Not because it is “cool,” but because it will enrich teaching and learning in your classroom. You, and your students, deserve it. You will come to question how and why, measure your progress and, if necessary, have enough confidence to ride against the tide. This is what it means to be a *TechnoTeacher*.

We will offer you advice along the way based on our expertise. Our “Nic advises”/ “Jules advises” sidebars will guide you. We will step outside the teaching experience, press pause, and give you time to catch your breath and reflect.

As mentors, we are still learning. Although we try our best to stay current in a field that is changing by the nanosecond, there are times when an important research paper or innovation does not land on our radar. Like any educator, we sometimes stumble. We have misconceptions. Julie, for example, is not at all certain about the cloud and how her storage locker in the stratosphere can hold her music and documents, next door to the satellite that is home to “Jill,” her GPS guide. Nicole is not sure where to start with computer programming. She also wonders if video will replace texting in the near future and what to do about that.

What we can say with all humility is that we have tried to make the Nic advises/Jules advises sidebars not just pie-in-the-sky dreams, but useful ideas derived from the hard-won lessons we have learned along the way.

Let’s get started.

FINAL THOUGHT: TECHNOTEACHERS IN CYBERSPACE

What happens if you want more support, ideas, or challenges after this book? Well, we’ve thought about that too. We would not be TechnoTeachers if we had not built a website, would we?

This book is very much the start of the TechnoTeacher journey. We know that in a short time some of our ideas will need a more contemporary backdrop. Come visit us at our website (www.TechnoTeachers.com) and other forms of social media to read, respond, and add to our newest ideas as part of the online “TechnoTeaching Learning Community.” Our aim is to make the website as interactive as possible. Come and share your ideas with others.

Our TechnoTeacher characters will be part of the mix, suggesting weekly missions so you can continue to plan, revise, and reflect upon your work.

Our biggest hope is that you will share your journey with us and help others with their teaching. Together we can keep on learning about learning.

This material has been reprinted with permission of the Harvard Education Press for personal use only. Any other use, print or electronic, will require written permission from the Press. For more information, please visit www.harvardeducationpress.org or call 1-888-437-1437.

Copyright © by the President and Fellows of Harvard College. All rights reserved.

The Harvard Education Press is an imprint of the Harvard Education Publishing Group, publishers of the Harvard Education Letter and the Harvard Educational Review. HEPG's editorial offices are located at 8 Story Street, First Floor, Cambridge, MA 02138, tel. 617-495-3432, or email to hepg@harvard.edu.