

WHAT IS THE CYCLE OF EXPERIMENT AND PEER LEARNING?

If you want to improve teaching and learning in schools, you should start by understanding how schools change. Once you understand the catalysts that inspire teachers to change their practice, it's much easier to plan ways of leading innovation and launching new ideas.

This is a book about planning and facilitating iterative change, and the good news is that school change is already cyclical. Even if you think that schools get better

through five-year strategic plans, if you zoom down into classrooms, departments, and grade-level teams, you will find that improvements are shaped by cycles rather than stages, by spirals of improvement rather than the unfolding of annual plans.

I've spent the better part of the past 20 years investigating how new education technologies impact schools. All too often, the sad answer is: not much. Schools around the country and across the world have made major investments in broadband, laptops, tablets, and other technologies in the hopes of improving student learning. In most places, even widespread adoption of new technology tools doesn't lead to changes in teaching practice that substantially improve student learning.¹

I remember visiting one of the very first high schools in the United States to have one computing device for every student, in this case an Apple iPad. I asked students what their favorite application was for the tablets. The overwhelming answer was a note-taking app: Evernote. They really liked taking notes for all their classes on one device, rather than in separate notebooks. That was their sense of the main change in their education! Spending \$800 per student to consolidate notebooks is not the best return on a community investment.

I've taught classes about education and online learning at MIT for a decade, and I often start class by asking students to tell me their "edtech story," something distinctive about new technologies from their own school experience. For the past few years, I've found myself in the "smartboard generation." My students are usually 19 or 20 years old, and when they were in middle school, digital whiteboards started appearing in their classrooms. Almost universally, students tell me that the digital features of these tools went entirely unused; they were just whiteboards. Sometimes students say the whiteboards got pushed to the side or the back of the classroom.

Out of all the schools I've visited, I have only been to a few places where new technologies really lead to new patterns in teaching and learning. Usually, really exciting changes are just limited to a pocket of a school or community. I visited a seventh-grade team in rural New Hampshire that reorganized all their classes for a few weeks—science, ELA, social studies, specials—around a giant collaborative history investigation that resulted in a collaborative website. It was a terrific initiative that defined learning for students for the whole year. But while this digital project was a highlight of the seventh-grade experience, not much seemed to have changed in the other grades.

While I was working on my dissertation, shortly after Google Docs was released for schools, I visited a middle school in southern California where iterative writing practices—with more frequent drafts, peer review, and teacher feedback—had spread across multiple courses and grades.² Students and teachers could describe concrete ways that writing instruction across the subjects had changed—and how student writing had improved—because of new schoolwide technology practices using Google Docs.

Whenever I encounter these places where change seems to have moved forward with striking breadth and depth, I always try to understand the details of how that change happened. I have visited and consulted with a zillion schools where new devices fall like a stone in a lake—a big splash, a few ripples, and then the lake returns to its former balance. How did this one school manage to make a substantial, important change in how they helped students learn, not just in a classroom or two, but in many classrooms throughout the building?

I asked some of the teachers about the role of school leadership, and the mystery only deepened. “I’m not sure they know exactly what we are doing,” one told me. What?!? I’m in a school where it really seems like some interesting changes are happening, and the principal team is just happily hiring subs and making sure the buses

run on time? The faculty described a kind of benign neglect of school leadership regarding these teaching changes: they were fine with it, the results seemed good, but they weren't really helping the process along, beyond letting teachers lead the way.

This story doesn't make any sense if you have a vision of change where strong leadership comes in with a clear direction, tells people how to improve teaching and learning, and then supports them in implementing new techniques and strategies. How can teaching change under the benign neglect of formal leadership? To expand the puzzle a bit: What is different about the schools where improvements are widespread and systemic, compared to places where changes seem more isolated and slow? To explain, you need a theory of teaching improvement and innovation where change can emerge from the bottom up in classrooms, libraries, and learning spaces.

CHANGING THE COMPLEX, FINE-GRAINED WORK OF TEACHING

If you want to understand the California school that lifted their writing instruction with collaborative writing tools, or if you want to understand any school where meaningful change in teaching is happening, then you have to recognize two crucial, underlying features of schools that dictate how nearly any kind of improvement unfolds.

First, schools are unfathomably complicated, and the classroom work of teaching is very, very fine grained. Think about a typical PK–12 school district in America, and everything that's happening in it today. A kindergartener is learning to tie her shoes or stand in line. A third-grader is using manipulatives to try to get a conceptual

handle on fractions. A fifth-grader with Down syndrome is getting occupational therapy. A seventh-grader is starting a new unit on sex education. There are students conjugating Spanish verbs, factoring polynomials, reflecting on the book *Beloved*, fixing cars, saying the Pledge of Allegiance, learning to critique their government, and on and on and on. It's baffling and magical that one institution can do all those things for all those different children.

When I say the work of teaching is fine grained, I mean that much of what happens in a kindergarten classroom is just not that relevant to the work in a calculus class. If you make a teaching unit better in Earth Science, it's not really going to help the Phys Ed teacher all that much. In fact, if you improve a plate tectonics unit in Earth Science, it may not even help your meteorology unit. Even within the same classroom, what we do from day to day and week to week can be startlingly different. We can certainly learn from one another, but implementing teaching improvements is often extremely local and anchored to one classroom.

That fine-grained complexity is why it's so hard for big, whole-school teaching initiatives to work. Let's say you are a superintendent, fresh out of your Doctorate in Education program, and you think that teaching should be data-driven, so you focus on formative assessment for the first few years. There are 13 grades of schooling in the district, dozens of courses across the subject areas, and 40 or so weeks of school. If you want one formative assessment a week in all those subjects in all those grand bands, you've just placed an order for thousands of new formative assessments, many of which will be quite different in important ways; the formative assessments about irony in *Romeo and Juliet* will be quite different from the formative assessments about state capitals.

Importantly, there are not enough administrators in your district office or your school building to do all this design work and to implement it in classrooms. The only people who can change teaching

and learning in schools are classroom teachers—and library-media specialists, and aides, and paraprofessionals, and all the amazing people who work directly with youth. That's the punch line of this meditation on the fine-grained complexity of schools: ***the only people who can actually change teaching and learning in schools are classroom teachers.***

Teachers are the only professionals who are numerous enough in school buildings to implement new teaching practices, all of which need to be customized to the specific needs of the particular subjects, topics, and students in a given classroom. For the school leaders reading: you can certainly help, and I'll get to that, but it's worth starting with some humility about what you can accomplish. You personally are not going to order changes or demonstrate some effective technique that will be rapidly cloned by your faculty. All change has to be localized classroom by classroom by teachers.

TEACHERS PRIMARILY CHANGE THEIR PEDAGOGY IN RESPONSE TO OTHER TEACHERS

So, if teachers are the only people who can implement teaching changes, then we arrive at the essential question of school improvement: *How do teachers learn to adopt new changes?* A very straightforward way to answer this vital question is just to ask teachers, like my colleague John Diamond did in Chicago public schools during the No Child Left Behind era. Professor Diamond asked teachers to describe who influenced what they taught—their curriculum—and who influenced how they taught—their pedagogy. There was a

mix of answers to the question of who influences curriculum: school leaders, state standards, and so forth. But to the question of who influences teaching practice, one answer stood out above all others: *other teachers*.³

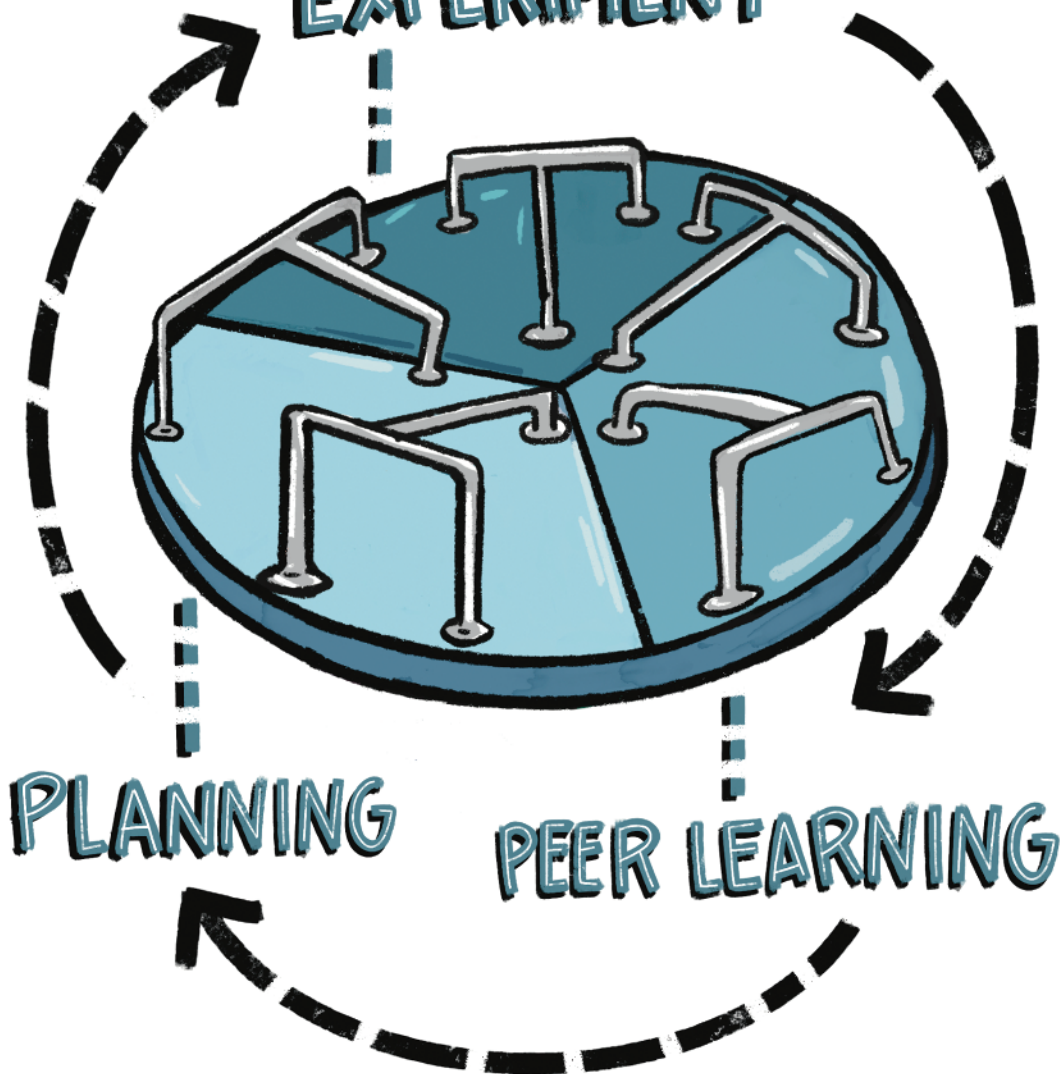
Teachers primarily change their practice in response to other teachers. With great apologies to principals, superintendents, educational consultants, coaches, publishers, and all the other people who are trying to contribute to this work, you are all second fiddlers (myself included!). The person most likely to influence a teacher's practice is their colleague.⁴

If you start from this bedrock fact that teachers primarily change their practice in response to inspiration and guidance from other teachers, then the whole work of school improvement centers around peer learning. School leadership can be tremendously important, but it's not what directly changes classroom practice. For school leaders, if you want teaching to change, then your primary job is to create conditions where teachers can learn from one another. Teacher leadership is urgent and vital. Classroom teachers, if school change is going to happen, it will come from you! In fact, it can *only* come from you.

As I've watched groups of teachers, grade-level teams, departments, and whole schools work on teaching improvements over the years, I've come to describe this work as the *Cycle of Experiment and Peer Learning*. In my research, I used the Cycle of Experiment and Peer Learning to explain the places where technology didn't sink like a stone, but, rather, led to meaningful changes in teaching practice. Since that work, I've come to realize that almost any story of school improvement has features of this cycle, because teacher innovation and leadership is at the center of the Cycle of Experiment and Peer Learning, and at the center of any real teaching changes in schools.

THE CYCLE of EXPERIMENT and PEER LEARNING

EXPERIMENT



THREE PHASES TO THE CYCLE OF EXPERIMENT AND PEER LEARNING

The Cycle of Experiment and Peer Learning has three parts: Experiment, Peer Learning, and Planning. Experimentation is when one teacher or a small group of educators tries out something new in a classroom, library, gym, or other learning space. Peer learning flows naturally from experiments, as educators discuss what they've tried and reflect on how it went. When experiments go well, more people get excited about them and want to get involved. Planning is the process of bringing people together to refine existing experiments and launch new ones. Here's how the whole cycle works:

EXPERIMENT

In many classrooms, teaching is in a steady state, an equilibrium. As teachers, we fumble our way to syllabi, curricula, units, routines, and methods that work, and most teachers tend to stick



with the tried and true on most days. There are lots of reasons for this equilibrium. One of the main ones is time: compared to other affluent countries around the world, teachers in the United States spend more time directly with students and less time on planning and collaboration than peers in other comparable countries. If you don't have time to plan and collaborate, it's hard to do new things.⁵

And let's be honest, trying new things in teaching is scary. It's embarrassing when a new lesson or new teaching technique flops. It's incredibly frustrating when you try a new technology and the logins don't work, or the Internet is slow, or it all just takes too long. Teachers know about how long their typical methods will take, but it's hard to predict how much time new approaches will consume from a lesson or a week. Many long-time teachers also suffer from "initiative fatigue." Every few years, they get a new principal or superintendent, who comes into the role hoping to promote their favored approach or innovation. States and communities make all kinds of demands of schools: new emphases, new concerns, new regulations. In many schools, these efforts tend to come and go, and teachers learn that it can be easier to sit on the sidelines and wait them out, rather than really diving into every new fad or idea that comes along.

But in every school I've visited, there's always a group of teachers willing to chart out into the unknown. They're willing to stay up late planning, toss out old lesson plans, and try something new. They thrive in exploration, experimentation, and uncertainty. And they can appear anywhere in a school: in the third grade, in the history department, among a few close friends with the tech director. There is a stereotype that the teachers most willing to experiment are young and new to the profession—and certainly those late planning nights are easier without young kids at home. But I've also found that there are lots of veteran classroom teachers who are masters of their craft, and they enjoy tweaking and improving. They have so many robust systems and routines set up that they have the time to be deliberate about trying new things. Kate Lewis, a veteran middle school teacher in Massachusetts, described the joys and trials of innovation this way:

Experimenting is exciting because the students are doing something new and you're doing something new, so they pick up on your enthusiasm for a new project or a new topic. It can be challenging, because sometimes things don't quite work out the way you expect them to. For example, my students were working on a collaborative book that we were going to all make together about grammar. However, once it got down to the logistical pieces of putting it all together, it just kind of fell apart. So sometimes you try something, and it doesn't work, and you just have to say, all right, what am I going to do moving forward to improve this? How could I make this better? But it's exciting when you see the kids get a spark, and they get excited about it, and they love doing the project.

PEER LEARNING

When teachers like Kate Lewis try new projects in their classroom, usually the work happens with at least a few other people. I saw this frequently with teachers experimenting with new technology projects. The projects required students



to do some research, so the teacher connected with the librarian. The project used a new technology tool, so the technology staff got involved. There was an aide or a paraprofessional in the classroom helping. In some cases, a few teachers worked together on the project. Sometimes a student would wander into class, look at you askance, and say, "Hey, how come we're not

doing what Ms. Lewis's class is doing?" And then you grin and respond, "Because Ms. Lewis loves her students more than I do," and then you go catch up with Ms. Lewis about what it is that she was up to.

Through these collaborations and encounters, usually a few teachers have a chance to discuss and reflect on a new initiative. Ms. Lewis asks, "What am I going to do moving forward to improve this?" and teachers look at the students' work to search for evidence of deep learning. They ask students what they liked and didn't like about the new lesson. They get some feedback from the aide helping some of their special education students. Through these conversations and reflection, teachers involved in the project come to understand what worked, what didn't, and how to improve. Educators at the periphery of the innovation get interested in hearing about it and consider trying new things.

Most schools are pretty good about having formal and informal spaces where these conversations can happen. Here's Kate Lewis again, talking about where these spaces are in her middle school in central Massachusetts:

In the middle school level, we teach as part of a team. So, we meet daily with the science, social studies, math, and language arts teachers, every single day. And that's a great time to just shoot out, "Hey, guess what I did, and this worked great." And then the other teachers think of ways that they can do similar things in their own classrooms, in their subjects. And then it helps spread it Also, we have biweekly curriculum meetings. So, every other week, each department meets together. And that's a really great time to share things that worked and to get feedback on it. We also have professional development days, where we're able to bring things in to our colleagues to get their feedback and ideas for improvement.

For example, this Friday, I'm in the process of developing a really big project-based learning unit with the math teacher on my team, and it focuses on starting a business, but more than that. It's about "What does it take to be successful in the world?" And I'm going to take it to my colleagues on Friday to do a project tuning protocol. So, I'll just bring it, and I will tell them "Here's what I'm really struggling with. What are your ideas? What can you do? What do you see here as the strengths and weaknesses?" And you kind of have to be willing to put things out there for everyone, even though they may have some critiques, but that's okay, because you need to take the critiques and learn from them.

When Chicago teachers in Professor Diamond's research said they primarily change their practice in response to other teachers, it's these kinds of formal and informal interactions that they are often talking about. In professional learning communities, grade-level teams, department meetings, teachers' lounges, and increasingly on social media, teachers hear about new things that are interesting, engaging, and help support student learning, and they talk about them with their colleagues. These reflections both help innovators refine their practice and draw more teachers into trying these experiments.

My MIT colleague Peter Senge has worked for many years with schools on systems change, and he describes most teachers as "patient pragmatists." In general, schools only have a few folks who are die-hard, constant experimenters. On the other end of the spectrum, schools typically only have a few teachers who are truly resistant to change. (And those who are resistant to change are

usually not opposed to improvements; they are just skeptical that changes lead to improvements.) Most teachers are sitting on the proverbial fence, waiting for someone else to give something a try, waiting for some evidence that a new teaching idea has some legs and is likely to be fun, engaging, and effective for learning before they hop off the fence and jump in. I don't mean that as a criticism: a school where every teacher was constantly trying new things would be chaotic and exhausting. Descriptively, most new improvement efforts in schools are not taken up widely at first; if a few innovators make some progress, then others will prove willing to hop in and join along.⁶

PLANNING

That leads to the third step of the Cycle of Experiment and Peer Learning: planning. When teachers try something new, they discover things that work and fail; they tinker and revise. If something seems pretty good, a teacher will tell a few colleagues, and a



few folks will hop off the fence and join. Separately or together, they'll plan a new iteration of the change initiative, this time with some more people, some bigger efforts, some deeper changes to plans, routines, or techniques. Again, Kate Lewis has sound advice for how planning starts to scale up change:

Start small but don't stay small. Make one small change. Maybe you have a project you've been doing for years that could use a little refreshment. Refresh that project. Just do one thing. And then next year, maybe try changing something new. And then eventually, what ends up happening is you're just changing everything. It's like, start small, but then get bigger as you go.

Ms. Lewis recognizes that improvements in teaching are almost always inherently iterative. You start small and get bigger as you repeat, revisit, and expand your experiments. When you visit the schools where teaching and learning are constantly improving bit by bit, you'll see teachers at all stages of this cycle: launching experiments, reflecting with colleagues, planning new experiments.

In observing these cycles in many schools, one charitable way to describe these activities is that they have a kind of natural, intuitive quality. Individual teachers are out there picking and choosing new things to try and refining their work here and there. But another way to describe this process is that teachers are planting a thousand flowers to bloom without any overall strategy. Teacher experimentation is often not part of any broader, coherent plan for school improvement. And teachers are often not very systematic about how they plan new experiments—about how they solicit student input, prototype, and evaluate new ideas, or test their innovation efforts. In the second and third sections of *Iterate*, I offer you more structured tools for thinking through and conducting this kind of work. In Part II, Design Thinking for Leading and Learning, we'll work through a protocol for designing new teaching ideas that helps you systematically evaluate challenges, design prototypes, and test new solutions. In Part III, the Collaborative Innovation Cycle, we explore another innovation cycle

that focuses on bringing coherence to these diverse efforts, so that lots of diverse experiments reinforce collaborative learning rather than simply diverging in a thousand directions.

WHAT'S MISSING FROM THE CYCLE OF EXPERIMENT AND PEER LEARNING

The Cycle of Experiment and Peer Learning is the result of *descriptive research*. When I was forming these ideas in my early research, I wasn't trying to make an argument about what *should* be happening, I was trying to describe what I saw. Maybe not surprisingly, what happens typically and naturally in schools isn't necessarily the best possible path forward. After reflecting over the past 15 years, I think there are three important ideas whose absence in the Cycle of Experiment and Peer Learning is worth noting.

EVALUATION AND MEASUREMENT

What does it mean when a teacher says “a lesson worked better” or “an activity didn’t work”? While executing a lesson—asking questions, guiding activities, giving lectures, responding to student



queries—teachers are also trying to figure out if a lesson is going well. Like many things in education, this evaluation is deceptively difficult to do. First off, if you are trying something new in your classroom, it probably takes a substantial amount of your concentration and attention just to make the procedures of the lesson work. What did I plan to say here? How many minutes should this part take? If you are

thinking about these questions while you are trying something new, it's also hard to be scanning the room and looking for evidence as to whether your teaching is working.

Even if you could concentrate on your teaching and 27 kids' learning at the same time, it's quite difficult to casually diagnose whether a lesson is working. A complete disaster is obvious: students can't follow directions, complete activities, or actively describe their confusion. But when things at least sort of work, it's very difficult to tell what kinds of learning experiences students had. If they follow instructions and complete activities, is that because the instructions were too rote, and they don't understand the underlying concepts? If they claim that a learning experience was confusing or difficult, does that represent a good amount of desirable difficulty? If they claim a learning experience was enjoyable and clear, does that mean that the teacher did too much of the heavy lifting and hard thinking? Can students transfer what they've learned from one lesson to the next lesson? The next unit? Another domain?

My colleague Ilana Horn argues that when teachers quickly or intuitively evaluate their own teaching, one of the main characteristics they look for is "smoothness." Were students compliant and generally happy? Did they ask some questions but not too many? Did they generally complete the planned tasks? Smoothness has its place in an orderly school or classroom, but smoothness does not ensure learning. Friction can be a great indicator of interesting learning. Smoothness can be a better signal of compliance than of insight.⁷

Answering questions about student learning and experience requires attention to measurement and evaluation. In my observations of schools and in my interviews and discussions with educators, I didn't see or hear much about systematic approaches to evaluating new approaches to teaching. A better version of the Cycle of Experiment and Peer Learning might be Experiment – Peer Learning – Evaluate – Plan. A core part of the Design Thinking for Leading and

Learning cycle is testing hypotheses and gathering evidence to confirm or reject them. A major part of the Collaborative Innovation Cycle is measuring progress and adjusting. So, in future chapters, I'll say more about evaluation, but I want to note here that it's an important piece of good iterative improvement that's often not an intuitive part of how educators experiment.

LOSS

I work in school innovation because I think it's really fun. When a new instructional technique sparks student interest, and when teachers can see how iterative improvements lead to rich, deeper student learning, that's incredibly exciting to me. When a group of educators pull together to build new things that are better than what they have been doing before, and when the work of that improvement feels collaborative and joyful, I find those spaces energizing.



But change is also inherently bound up with loss. That loss is obvious with changes that move schools in the wrong direction. Many early childhood educators have critiqued the push toward making early grades like kindergarten more academic and more structured, and they mourn the loss of time devoted to play, exploration, and spontaneity in those grades.⁸

It's easy to observe that kind of loss when schools change for the worse, but that loss is also found even with efforts to improve

teaching and learning. One of my earliest school improvement efforts was as a ninth-grade world history teacher. I was part of a four-person team that taught *History of the Human Community*, a world history class that covered early hominids through the Renaissance. It was a kind of death march history class, the Sumarians on Monday, Mesopotamia on Tuesday, and on and on, plowing through the empires until you made it to the Medicis in Florence. At the end of my second year, my colleagues and I realized that nobody really liked this class. The students, even those who loved history, rarely rated it their favorite class. We didn't really like teaching it. We were basically still offering the course because some long-retired guy had created it years ago, and we just stuck with it.

We decided to reformat the course as four major units, where in each unit we'd trace the identities of people involved in contemporary conflicts back into the ancient world. We covered many fewer topics and periods in history, but we taught our carefully selected topics with much greater depth.⁹

Generally, my fellow world history teachers were supportive of this plan, but the changes were quite hard for my dear colleague Tom Daccord. Tom had developed two fantastic units about the Greek and Roman empires. There were good reasons to leave these out of the new curriculum: most of our students had experience with them in middle school, and we had a good classics department that afforded opportunities for interested students to pursue more advanced study. But Tom loved those units, had poured his heart into them, and he was really, genuinely sad to see them cut from the curriculum.

The story has a happy ending. Tom eventually, with some reluctance, agreed to our changes, we all taught the new course together, and it went brilliantly. With the benefit of hindsight, Tom agreed with our assessment that the benefits of a narrower, deeper curriculum were worth the costs of sidelining some of his favorite content to teach. He became a great advocate for our work within and beyond the school.

But—and here’s the important part—*it still hurt*. Even though we were incredibly excited to be doing something new, and we needed the energy from that excitement to power us through all the extra work a curriculum reform requires, we still needed to make space for Tom’s sadness. Our change necessitated that Tom lose something he cared about. It wasn’t just a pair of well-planned units. Teaching about the Greeks and Romans was part of Tom’s identity as a teacher and as a citizen.

Usually when I talk and write about the Cycle of Experiment and Peer Learning, I describe teachers like Kate Lewis who are having a ball with their students trying new things. But it’s also important to recognize the sadness and loss inherent in change—not just inherent in people resisting changes they don’t like, but in adjusting to changes that they ultimately believe in. People need to mourn loss; at the time, I’m not sure we did enough to help Tom have a little space to say goodbye to his work with the Greeks and Romans.

Since change involves loss, it also inevitably involves addressing people’s emotions, managing conflict and disagreement, and bringing a sense of empathy to the work. My MIT colleague Peter Senge sometimes says that we too often mistake leadership as a “neck-up” activity, all brains and no heart. In the Collaborative Innovation Cycle in Part III, I explicitly adjust how we can “manage the ups and downs” of the change process. But for now, it’s enough to say that even though the Cycle of Experiment and Peer Learning is about iterating toward something better, and the process overall can be quite joyful and satisfying, we know that some people involved will experience loss along the way.

POWER, DIFFERENCE, AND DESIGN JUSTICE

In researching school change and technology adoption, I was often asking the question “How do learners from different backgrounds and life circumstances use technology differently?” For instance,

when I observed and interviewed teachers experimenting with new technology-rich approaches to teaching and learning, they would first try new things with their Advanced Placement classes or with their Honors students. Students in regular classes missed out.



Teachers had sensible reasons for making these decisions: advanced classes were smaller, their students were more resilient to teaching failures, they had fewer issues with disruptive student behavior, and so forth. In some cases, teachers piloted cool new things with their AP students that they then used with all their classes. But in some cases, teachers focused their innovation efforts on their students in advanced classes, and the benefits were limited to those groups. The opportunities to be in advanced classes are not distributed equally. Black, Latino, and Native American students are less likely to have the opportunity to be in these classes than White students; affluent students are more likely to be in these classes than working-class students.¹⁰

So, when the teachers that I observed focused their innovation efforts on the most advanced students, they were also often focusing their extra planning and improvement time on the most well-supported, already-successful students under their care. These classroom-level patterns that I saw in my observations also cohered with findings from national surveys of teachers and students. For decades, researchers have studied technology use in school and found

consistently that when young people use technology in schools, White and affluent students are more likely to use edtech for creative expression or complex projects with substantial adult mentorship and support, while poverty-impacted students and students from minority backgrounds are more likely to use technology for drill-and-practice applications with less support from adults and mentors. What seemed to teachers like a sensible, defensible local choice was contributing to broad national patterns that I believe most educators would find unacceptable. It is possible to innovate in ways that reduce inequalities, but it is also quite possible to innovate in ways that reinforce existing inequalities.¹¹

Iteration is a tool, and potentially a powerful one. We do not all have equal power and standing to take risks. A tenured teacher can take different stances toward innovation than a pre-tenure teacher can. My LGBTQ colleagues and colleagues from racial, ethnic, and religious minority groups bear risks in their innovation work that are different from the risks that I take on as an affluent White guy. Power and difference not only affect the outcomes of our improvement efforts, but also people's experiences within those improvement efforts.

The Cycle of Experiment and Peer Learning doesn't attend to these kinds of issues of power, difference, and opportunity. It describes an iterative improvement process, but it doesn't offer any guidance to direct that process toward aims that heal divisions, reduce systematic inequalities, or necessarily promote positive change. None of the three frameworks presented in this book have an explicit step that asks you, in your improvement effort, to stop and have an "equity moment" or go through a "justice evaluation process." Instead, at every step of our iterative improvement efforts, we need to ask who is in the room, how people are being included, and how power and difference shape our goals.

Every model simplifies reality so we can make sense of it, and the Cycle of Experiment and Peer Learning is no exception. I have highlighted evaluation, loss, and power as three dimensions that seem conspicuously absent to me; other missing pieces might be obvious to you. The point, as with thinking about putting this model into action, is to give us something simple enough to start with and communicate to others, while recognizing that the immense complexity of schools in a diverse, democratic society means that we will always have to build nuance into our thinking. I hope you'll keep these missing pieces in mind, as we turn toward putting the Cycle of Experiment and Peer Learning to work!

LEADERSHIP AND THE CYCLE OF EXPERIMENT AND PEER LEARNING

Now that we have a model for how teaching changes—teacher to teacher, one at a time—in classrooms, we can go back to our puzzling question from the beginning of this chapter: What is different about the schools in which improvements are widespread and systemic, compared to places where changes seem isolated and slow?

In schools with systemic, widespread change, teachers try new practices, debrief those experiences with colleagues, and share what they've learned with others. As other teachers learn about new innovations, they move beyond individual classrooms across departments, grades, and entire schools. The Cycle of Experiment and Peer Learning describes this process of learning, sharing, and iterative improvement.

The good news is that every school has educators participating in the Cycle of Experiment and Peer Learning. I've never visited a school that didn't have these seeds planted somewhere. But a few things distinguish the schools where improvements are happening more widely and readily. First, the Cycle of Experiment and Peer Learning is spinning faster: there are more experiments, more reflections, and more plans happening. A major point of emphasis throughout this book is that the structure of curriculum—three-week units, four-month semesters, nine-month academic years—can make iteration unfold over years. But as teachers, we don't have that many years in our whole careers! So, if we want iteration to lead to deeper, wider change, we have to find ways to spin the cycle faster. Second, we need these cycles to constantly draw in more people. When Ms. Lewis talks about starting small and getting bigger as you go, she's talking about making pedagogical changes that deepen with each passing cycle in an individual classroom. But we also want our best ideas and most productive changes spreading across multiple classrooms.

That was what was so special about what was happening in the Southern California school that had embraced iterative, collaborative writing across the curriculum. They weren't just making teaching better in one classroom, they were sharing ideas and routines with each other so that the practices could be shared across different subjects and grade levels. And they did it without any designated school-wide collaborative writing or Google Docs initiative, and indeed without even having much engagement from school leadership at all. That's perhaps not the best way for change to happen, but it is a powerful demonstration for how teacher leadership, teacher innovation, and teacher peer-to-peer learning is essential to the Cycle of Experiment and Peer Learning, and how teaching and learning improves in classrooms.

The bottom-up, teacher-led, Cycle of Experiment and Peer Learning often is the real driver of change even when an initiative appears to be top-down and imposed by some administration. If you peer closely enough into nearly any teaching effort at schools—new curriculum, new technology, new teaching approaches—you'll find that it is exceedingly rare that a principal gets up at a faculty meeting and says, "Now, we're all doing it this way," and all of the faculty leap out of their seats and say, "Yes, definitely; that's a great way; let's do that!"

Schools are what sociologists call "loosely coupled" institutions: there is visible hierarchy, but the many folks at the bottom of the hierarchy do not reliably follow directives from the top. Aviation is a tightly coupled industry. If the FAA requires some additional maintenance check or preflight step, it will happen quickly and universally. (Think of how fast the technologies, policies, and practices of mobile phones and "airplane mode" spread across the entire global aviation industry.) School is not like that.¹²

A school can mandate a new textbook for the math department, but many teachers will still use their old slides, worksheets, and activities for the first few years. Someone in the department will try out the new program in a full-bore, whole-hog way, and report to colleagues on how it's going. Teachers will discuss what works particularly well in the new textbook, what materials from older systems are still superior, and slowly a group of faculty might over time migrate to a new program. Even when change looks like it results from decisions made by school leadership, the actual adoption on the ground is slower, more collaborative, and more iterative.

Once you understand how the Cycle of Experiment and Peer Learning works in schools, the role of leadership in schools becomes clearer.

First and foremost, teacher leadership is essential to starting, scaling, and sustaining new practices in schools. You can't have new practices without teachers and librarians and other instructional folks putting those practices in action, and you can't spread those practices without teachers sharing and teaching one another. There are not enough administrators in any school building or district to do all the incredibly fine-grained, lesson-by-lesson, unit-by-unit, subject-by-subject design and redesign that innovation requires. And even if the school principal is highly regarded as a master teacher, current practicing teachers are less interested in getting their pedagogical tips from someone out of the classroom. They want to learn and grow with their peers who are currently teaching. If you are a teacher, your leadership in service of change and innovation in schools is indispensable.

Now, if you are a principal, or a school consultant, or an MIT professor who hasn't taught in a K-12 classroom in 15 years, then it's important to bring humility to your leadership work. People outside the classroom cannot do the most important work that pedagogical innovation requires, which is inventing and refining new practices and sharing them with others. Instead, your role is providing the time, resources, encouragement, and support to grease the gears of this cycle. Your job is to empower teachers so that they can conduct experiments, share and learn with colleagues, and then plan further experiments. Ideally, you can help this cycle spin faster, and with more opportunities for joy, reflection, and camaraderie. Teachers, sadly, are rarely paid extra for refining their teaching instead of sticking with what they've always done. In places where educators are constantly working to refine their practice, they often do so because they see how it benefits students, and because they simply enjoy experimentation and collaboration with colleagues. Making these efforts enjoyable is an essential part of making them sustainable. In the next chapter, we explore how we can support teachers in these important activities.



Ms. Mills wondered how to get all her students engaged in their current topic -- even the quiet ones...



She decided to introduce her class to Socratic seminars as an experiment.



Afterwards, at lunch with colleagues, Ms. Mills shared how well the Socratic seminar went.

Look what I brought!

Oh yum! Is that your newest recipe?

Wait, I have to tell you both all about how class went first!



Her department head, Mr. Davis, visited the class and encouraged others to do the same.



Thank you for subbing in for me! I'll be back in twenty.

You're welcome! Enjoy visiting Ms. Mill's class!



The principal was thrilled to see the English department rally around a new idea that engaged students.



We look forward to your support as a coach next year!

I'm honored!

Ms. Mills was granted a one-course release to help other teachers prepare their Socratic seminars, which Mr. Davis said everyone should try at least once this fall.

