



what kids can  
tell us about  
**motivation**  
and **mastery**

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FIRES  
IN THE  
MIND

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# What Does It Take to Get Good?

**I**N A BIG PUBLIC HIGH SCHOOL ON the west side of Chicago, a ninth-grade boy named Joshua is describing the thing he does best in life. We sit in his reading and writing classroom, twenty-eight students in a circle, me with an audio-recorder. “I’m real good at architecture,” Joshua says matter-of-factly.

I am startled, even skeptical. Architecture in ninth grade? How?

Joshua goes on. His interest started when he was about eleven, he says, as he watched his uncle, a building contractor, draw up plans on a computer.

I was, like, “Can I do it?” And once I tried it, I liked it. I can draw out the layout of a building, make electrical wires in the layout, stuff like that. It was hard learning how to use the software, because it was something I never used before. It took me a couple months—it was real frustrating. I remember trying to find out how to make a wall longer, and my uncle, he wasn’t there to help me. I had to go to “Help” to read how to do it. I don’t like reading, but I was determined to learn how to use this software. — JOSHUA F.



## WHAT KIDS TELL US

**Everything takes practice. It’s not like one day you can just get up and say, “I’m going to do something.” You got to practice at it.**

— DARRIUS

All of us in the room believe him now, because Joshua is talking about a situation most of us know well: trying to master something hard. We recognize his frustration as he goes after what he wants, just beyond his reach. We hear how his resolve and confidence increase as he pushes past obstacles. And when Joshua tells us the result, we hear his pride and purpose. Last summer, one of his neighbors was planning to put up a small strip mall nearby. He couldn't afford to pay for design, and so he asked Joshua—a reluctant reader who was just about to enter ninth grade—to draw up the plans.

## THE PRACTICE PROJECT

What does it take, I asked the students speaking with me that day, to get really good at something?

A simple question, it reverberates at many levels. It matters equally to youth and adults, rich and poor, professional, artist, and tradesperson. Its answers have the potential to transform our schools and communities. And exciting research on the question of developing expertise has emerged in recent decades from the field of cognitive psychology.

Powerful new evidence shows that opportunity and practice have far more impact on high performance than does innate talent. We all have heard by now that *ten thousand hours* of practice—that's three hours a day, six days a week, for ten years—goes into making.

To understand what this meant for everyday teaching and learning, I started asking adolescents themselves in an initiative sponsored by the national nonprofit What Kids Can Do. Reaching out to schools and youth organizations, I looked not for prodigies but for 160 ordinary teenagers willing to talk with me about their lives and learning. They came from diverse backgrounds around the United States, ranging from cities to rural communities. Together, we

explored how young people acquire the knowledge, skills, and habits that help them rise to mastery in a field.

To my surprise, every one of these youth could name something they were already good at. Many of them—not just the unusually talented—were even growing expert at it, although sometimes the adults in their lives had not noticed. Their examples kept coming: music, dance, drawing, drama, knitting, chess, video games, running, soccer, building robots, braiding hair, writing poems, skateboarding, cooking. So much sustained practice in pursuit of mastery—and so much of it happening out of school!

In days of discussion, the kids and I picked apart how they got started at these activities, why they kept going, and what setbacks and satisfactions they experienced as they put in the necessary practice. We discovered a great deal about why young people engage deeply in work that challenges them. And as we analyzed their experiences, we also began to think differently about what goes on in schools. Could what these young people already understood about practice also apply to their academic learning? Could teachers build on kids' strengths and affinities, coaching them in the same habits experts use? What did it take to light a fire in the mind of an adolescent that would fuel a lifelong passion for learning?

## **STARTING OUT AND KEEPING GOING**

These teenagers' stories brought into vivid relief the research on how expertise develops. Few of them started their chosen activity because they had “natural talent.” Largely, they gravitated to something because it looked like fun, because they wanted to be with others who were doing it, and because someone gave them a chance and encouraged them.

Chapter 2 is filled with their stories of how that first spark caught. Joey, a nationally ranked archer at sixteen, first picked up a bow and arrow at six, because he wanted to “hang out with my dad in the back yard and shoot bales.” Ninoshka learned to knit from her grandmother, who “would not be mad at me, no matter what came out wrong, because she was trying to make me better at it.” Kellie tried double-dutch jump-rope only when her big sister counted her down to the first scary move.

Kids have to want something before they risk trying, said Ariel, a young skateboarder in New York City:

If something’s very fun-looking to you, you just get right into it. That inspiration from watching other people do new things, it gives you the confidence in yourself where you can go out and try it. — ARIEL V.

Even a small success at the start helped their initial interest burn bright, these young people said. Not far into their learning, however, they faced significant frustration—and what happened next made a critical difference. To succeed, they say in Chapter 3, they would have to stick with it.

“Everything takes practice,” said Darrius, a Chicago student bent on becoming an artist:

It’s not like one day you can just get up and say, “I’m going to do something.” You got to practice at it. You might be good at it when you first start off, but you still got to practice so you can get better, because no one’s perfect. Like me: I can draw real good. But certain things that I want to do in drawing, I can’t do right now. So I just keep working at it. — DARRIUS

When they hit discouraging points, most students said, they only continued if they had a strong relationship with someone who supported them through the rough spots. “The people who sit next to

you have a big part in how you get better at something,” observed Janiy, who studied the piano:

Without them you can start getting lazy, and you want to give up if you don't get it right the first time. I give up on the inside, and she tells me, “Again. Come on . . . once more.” – JANIY

In school, too, these youth persisted with challenging material only when their practice was supported. From their outside activities, they had a healthy respect for the base of knowledge they needed in order to do something well. They knew that the right kind of practice would help them recall what they learned, just when they needed it later.

Mike, a young drummer from Maine, told of learning the double-stroke roll, “where your stick bounces once on the snare, like ‘*buh-bum,*’ and you hit the other stick and it bounces.” His teacher kept him practicing it for weeks, until the action came to him effortlessly:

You just have to go slow, and play that forever until you understand the movement. Then once you get comfortable with it, you just work your way up, play a little bit faster, and then just a little bit faster. – MIKE

The wrong kind of practice, however, could stop these young learners in their tracks. If she couldn't expect to succeed at something with a reasonable amount of effort, Iona said, she wouldn't even bother to try:

When people are only faced with their failures, they tend to want to give up. They need help to see their own progress, so that they don't only see how bad they are doing. They need to see the fun in it, and to see some reward in completing the task. – IONA

These teenagers were describing what cognitive researchers like K. Anders Ericsson call “deliberate practice.” Their learning tasks were set at a challenge level just right for them. They repeated a task in a

focused, attentive way, at intervals that helped them recall its key elements. All along, they received and adjusted to feedback, correcting their mistakes and savoring small successes. (In Chapter 5, they explore the elements of deliberate practice in their most compelling activities.)

When their practice went just right, kids told me, they felt caught up in a state of “flow”: the energized, full involvement of going after a challenge within their reach. As Aaron, a basketball player, described it:

Running down the court, it's like a lion hunting for its prey: There's nothing else on its mind but that prey. And that's what makes it so beautiful, just the strive of it. — AARON

## LEARNING FROM EXPERTS

Watching accomplished people do something well often made these teenagers want to practice even more. Talking to experts directly was even better. As Mike said, “If I meet a musician I look up to, everything he says is like it was bolded out.”

So I sent students out to interview people from their communities whom they considered masters in their fields—plumbers, farmers, physicians, church organists, psychologists, engineers, and so on. And as the kids transcribed those interviews, they saw many similarities to their own learning journeys.

Every expert's story started with a spark of interest that somebody noticed and fanned. All had the opportunity to explore that interest further, with someone nearby to encourage, critique, and suggest next steps. Small successes along the way rewarded hours of practice—and with a challenge met, the experts wanted to go further.

Whether the person interviewed was a surgeon, a tattoo artist, or a detective, each of these experts had developed certain habits along

the way. Some were ways of thinking, we realized, and others were ways of approaching their work. The students and I made a list and returned to it often, checking whether kids were developing these same habits through their own practice. (We say more about this in Chapter 4, “Asking the Experts.”)

Was it competition or collaboration, public performance or private satisfactions that drove these experts through their years of practice? Those are among the questions that my students address in Chapter 6, “Practice and Performance.” But in all the different answers that they gathered, they recognized the quality of flow—“the strive of it”—that they already knew well. Energized by that discovery, the kids were ready to explore what could bring that full engagement into schoolwork.

## **TAKING PRACTICE TO SCHOOL**

Nothing compared to “the strive of it,” these young people agreed. Yet they felt that sense of involvement in a challenge most fully outside of the classroom. Some kids threw themselves into reading, writing, and the arts, but even those activities rarely coincided with their formal schooling. How might schools transfer the excitement of learning from one realm to the other? As one student observed,

If teachers knew what gave us that driving force to do better, they could apply that, so that everyone can do things to the best of their ability. — AVELINA

Our Practice Project was already sharpening these young people’s curiosity about learning, giving them a new way to talk about it, and turning them into “experts in expertise.” Perhaps their teachers, too, could gain new insights from looking closely at out-of-school learning. Such understanding could only have good effects, said Rachel, a San Antonio student:

The teachers you have along the way can either make or break you. They pass along to you their own learning process. — RACHEL M.

In Chapter 7, “Bringing Practice into the Classroom,” students did not suggest making direct links between their interests and school subjects. Instead, they reminded teachers of the meaning and value they found in outside-school commitments, and asked them to look for that in school subjects, too. Micah, in San Antonio, explained:

You want to delve into the reason why you are doing something, instead of just blindly following what the teacher tells you to do. If you are getting the answer without really realizing why it’s important, it’s empty. You are not really learning. You are going to drop that later, because it has no importance to you in your life. — MICAH

Sometimes, Samantha said, teachers seemed to focus more on students’ standardized test results than on their actual understanding.

They go too much by the book. They worry about the perfect answer, rather than worrying about if we’ve learned something. — SAMANTHA

Homework, too, came under their scrutiny in Chapter 8, as students held their assignments up to the criteria for deliberate practice and found them largely wanting. Often, homework had little to do with what individual students needed to practice, and they responded by giving it little of their attention.

Their best work at school, these teenagers said, got them to practice the *habits* we had seen our experts using—adapting the details to fit each learner’s profile. Darrian, for example, joined her school’s chess club in elementary school and, a few years later, learned to like math as well:

Actually, math is my favorite subject now. I like figuring out how to do problems, and I find logic questions so much fun. I think chess

helped me find that deep inside—it was probably always there, but I just never knew where it was. — DARRIAN

For other students, the most compelling school experiences involved hands-on projects where they could work in teams toward an outcome that mattered to them. (We devote Chapter 9 to this subject.) Tyler described a science project involving genetic research and technology, which had gripped his imagination for months:

One driving factor here is the experiment itself: the curiosity about what the answer will be! Another is the real world application: being able to develop something that can actually help people. — TYLER

## TEN THOUSAND HOURS

What can we draw from teenagers' outside-school experiences to inform what—and how—we ask them to practice in school? How would our classroom teaching change, if we used expert habits as our touchstone? What part would parents and other adults outside the school play in the education of adolescents?

As we listen in coming chapters to young people describe their most compelling pursuits, we will learn more about how the right conditions can motivate youth to practice until they reach mastery. And a picture will emerge of a shared community of knowledge-building that embraces home, classroom, and outside learning opportunities.

In our concluding Chapter 10, students offer concrete suggestions for helping schools function more like expert learning situations outside the classroom. When youth are willing to help think through that shift with adults, as they do here, a powerful learning partnership can result. (As an Appendix, we outline a five-day curriculum for groups that want to try it.) Even more important, as students

come to recognize that all teaching is also a practice, they join an expert culture that intertwines their learning with our own.

To break down concepts and make them understandable is an art. And to relate to students and tailor your teaching style to all different types of learners is a sort of expertise. — BRIDGET

When adults openly explore our genuine questions about getting to mastery—and include young people’s knowledge and experiences in that exploration—we model the expert’s habit of taking intellectual and creative risks. We demonstrate that we, too, always have things we need to understand better, and things we need to practice. We teach kids to approach any lack of understanding as a puzzle: stretching the limits of their competence, continually testing new possibilities and seeing how they work out. As they expand their knowledge and skills, young people, like us, will discover even more challenging puzzles they want to tackle—not just outside school, but as part of it.

“Train every day, then you will see,” advised the samurai Musashi, four hundred years ago. Ten thousand hours—that roughly corresponds to the time students spend in school during four years of high school and four years of college. What are we asking our youth to practice in that precious time? What fires are we lighting in their minds?