To two future college students,
Adam Bain and Nathan Bain,
to all future grandchildren,
and to Andra Looper,
the little girl who was so fascinated with astronomy
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I

THE ROOTS OF SUCCESS

Sherry Kafka came from a small town in the Arkansas Ozarks. Her little community in the backwoods of that largely rural state had none of the artistic trappings that would later define her life and make her one of the most celebrated designers and planners in the country. In fact, she later reported, her town didn't even have a movie theater. Once a week, "a gentleman" would come to town with a tent, set it up in the square, and show a movie "if he didn't get drunk that week."

Her family didn't have much money, and they moved around a lot trying to make ends meet. She went to sixteen schools in twelve years, and midway through her senior year she transferred from a fairly large school in Hot Springs to a tiny hamlet that had only six graduating students. "I think only five of us actually made it," she later reported. "I even went to schools that don't exist anymore because they were so small and could barely scrape together enough teachers." Yet all that moving didn't daunt her. "It made me forge my own methods of using what the schools offered me," she concluded. "I figured out very early that all schools are cultures, and my job was to go into that school and understand how that culture works."

No one in her family had ever gone to college right out of high school, although her father did attend a Baptist seminary later on.
They seldom read anything but the Bible, and except for the Holy Word, they had no books in the houses where she grew up—only stories. When she was four and five, her great-grandfather would tell her stories he had heard from his parents, or ones he had just made up along the way. After spinning a yarn that would fascinate the little girl, he would point at her and say, “Now you tell me a story.” And so she would begin. The old man would ask her questions about the characters and animals wandering through her tales, forcing her to invent more details about them. When Sherry was in the eighth grade, a few years after her great-grandfather passed away, she decided she was a “person of the story” and that she wanted to be a writer. To become a writer, she realized that she needed to learn more, and that meant eventually going to college.

Because her family was poor, she knew it wouldn’t be easy, and thus she began to fish around for some means to pay for her higher education. In her senior year of high school, she entered and won a national writing contest that promised to pay all expenses for her first year in college. When she asked her parents where she could go to school on the scholarship, they told her she could go to a university in Texas because they knew a dorm director there who could keep an eye on her if she got sick.

That fall she arrived on campus, full of excitement about her new adventure in this faraway city, and was presented with a list of mandatory courses. Before she left home, however, she had promised herself that every semester, she would take at least one course “just for me,” something she would enjoy. When she looked at the list of requirements, she spotted a happy coincidence, a course that looked interesting but also fulfilled a fine arts requirement.

It was a course in the Drama Department called “Integration of Abilities.” The title itself spoke to a childhood memory. When she was a little girl, her father had told her that the most successful people, “the most interesting” people, the people “who got the most out of life,” were the “people who were the best integrated.” He had told her that she should make a connection between every course she took and find ways that they overlapped. “When I studied,” she concluded, “I should think about what happened in biology and how that applied to English, or music.”

She decided to enroll. It would change her life.

Her class met in a strange theater with stages on four sides and chairs that you could spin around to face any direction. As she sat in one of those high-backed chairs the first day, a man with dark, wavy hair came into the room and sat on the edge of one of the stages. He began speaking about creativity and people. “This is a class in discovering your own creative ability,” he told the students, “and all you will have to help you with your discovery is yourself and getting acquainted with the way you work.”

Sherry later reported that she’d never encountered anything quite like this strange man who sat on the edge of the stage in his suit and tie. “We’re going to give you some problems,” he said, “and some of them are pretty crazy, but they all work.” As Sherry twisted a bit in her revolving chair, he continued. “What you bring to this class is yourself and your desire to participate, and what you do in here depends finally upon that.”

Over that first meeting and in the days to come, her professor, Paul Baker, invited Sherry and the other students to participate in a new kind of learning. “To some,” he said, “growth is almost all just improving your memory. To others, “it lies in learning how gadgets work—how to put motors together, how to attach pipes, mix formulas, solve problems.” The purpose of that type of growth, he said, “is never to develop a new method but to become extremely adept at
the old ones.” To a third group, growth means you develop “cults” and “systems” in which you can estimate “how far below your own standards other people have fallen.” You “join, dictate, slap backs, smoke cigars in backrooms, belong to important committees, become a pseudo artist, musician, actor, prophet, preacher, politician. You drop names and surround yourself with position.”

To only a few, Baker concluded, “growth is the discovery of the dynamic power of the mind.” It is discovering yourself, and who you are, and how you can use yourself. That’s all you have. Baker emphasized that in all of human history, no one has ever had your set of body chemistries and life experiences. No one has ever had a brain exactly like yours. You are one of a kind. You can look at problems from an angle no one else can see. But you must find out who you are and how you work if you expect to unleash the powers of your own mind.

As Sherry Kafka sat in that revolving chair, now listening intently, her professor invited her into that highest level of growth. “Everybody is unique,” he kept saying, and you have much to contribute to the world. “Each of you has your own philosophy, your own viewpoint, your own physical tensions and background,” he emphasized. “You come from a certain soil, a certain family with or without religious background. You were born in a certain house to a certain family at a certain time. Nobody else in the world has done so.” You can, Baker argued, create in ways that no one else can.

This is a book about creative people and how they became that way. These creative people went to college and emerged from that experience as dynamic and innovative men and women who changed the world in which they lived. How did their college experiences, particularly their interactions with professors, change their patterns of thinking? Although current and future college students may find this question most compelling, teachers or parents will also find solutions here for fostering creative development and deep learning.

Who We Studied and Why

I begin with the story of Sherry Kafka because her experience in that course with Paul Baker reflects many of the major concepts and approaches we will encounter repeatedly, and because that course transformed the lives of hundreds of people who became scientists, musicians, physicians, carpenters, historians, painters, hairdressers, philanthropists, editors, political leaders, teachers, philosophers, writers, designers, engineers, and a raft of other creative folks. What those “best students” did was take a phenomenal class, often far afield from their major area of study, and use their experiences in that course to change their lives.

They pursued the development of the dynamic power of the mind, and that end—not academic honors or simply surviving college—became their primary goal. In Baker’s course, they learned a new language of creativity that centered on what you do with space, time, motion, sound, and silhouette. Sherry and her classmates came to understand themselves better and out of those insights to appreciate the unique qualities and experience that they could bring to any project. In turn, the more they understood about themselves, the greater confidence they had, and the more they appreciated the special qualities and achievements of everyone else. They became students of other people’s histories—in the sciences, humanities, and arts. Most important, they found a way to motivate themselves to work.

I should say right now that this is not about people who made the highest grades in college. Most books and articles on being the
“best student” concentrate only on making the grade. But my fellow interviewer, Marsha Bain, and I were after bigger game. We wanted to know how people did after they left school, and we selected people to follow only if they obviously learned deeply and subsequently became those highly productive individuals who continued to grow and create. We wanted to find interesting people who are aware of the world, difficult to fool, curious, compassionate, critical thinkers, creative, and happy. We sought men and women who enjoyed a challenge, whether in learning a new language or solving a problem, people who recognized when old ways would not work, who were comfortable with the strange and challenging, who had fun finding new solutions, and who were at ease with themselves.

We wanted to know how they got to be that way. How did they find their passion? How did they make the most of their education? How can we learn from them? In some cases, these highly confident, creative problem solvers learned despite college; in others, they flourished through their wonderful experiences there. Some of them have always been successful. Others spent most of their high school years barely scraping by before finally breaking out of the pack in college, or even later.

We looked for people who have distinguished themselves with great discoveries or new ways of thinking, who make good decisions and have the self-confidence to explore, to invent, to question. A physician who established a path-breaking practice, a teacher who made a huge difference in students’ lives, a comedian who changed the way people laugh, a writer who captivated readers, a musician who redefined music, an innovative bricklayer or dress designer—all these are examples of people who adapt easily to new situations and can solve problems they have never encountered before.

Did they make tons of money? In some cases, yes, but that wasn’t part of our criteria. If any of the people we interviewed had accumulated considerable wealth, we were interested in what they did with it, how creative they became. In other cases where the financial reward had accumulated slowly, we wanted to know how they spent their lives, and what they produced.

Did they also make good grades in college? For the most part, yes, but so did lots of other people who didn’t really benefit from their education in the same way. High marks, by themselves, don’t tell us much. Consider for a moment the history of grades. They haven’t always been a part of formal schooling. About two hundred years ago, society began asking educators to tell them how much students had learned. Somebody somewhere—probably at Oxford or Cambridge in the late 1700s—came up with the system of giving the best learners A’s, the next best B’s, and so forth. It was just a system of shorthand that was supposed to describe how well people think. Through most of the 1800s, schools in England and the United States used only two grades. You either got credit for taking a certain course or you didn’t. But by the late 1800s, schools had adopted a range of grades from A to F, from one to ten, or some other scale. In the twentieth century they added pluses and minuses.

What did all those letters and symbols tell you? Quite often, not much. As Neil deGrasse Tyson, the astrophysicist who directs the Hayden Planetarium, put it, “As an adult, no one ever asks you what your grades were. Grades become irrelevant.” And with good reason. It’s pretty difficult to get inside someone’s head and discover what they understand, let alone anticipate what they will be able to do with that understanding. As a result, grades have often been lousy predictors of future success or failure. Martin Luther King Jr., for example, received a C in public speaking.

A few years ago, two physicists at an American university con-
told me about a subject he had actually taken twice, once as an undergraduate and again in graduate school. "To this day," he said, "I don’t understand that material, but I made A’s in both of those classes. I learned to study in the right way and pass the examinations with flying colors, but I never really learned anything." He had learned deeply from other courses and had become quite successful in his field. But imagine for a moment that his experience in that one subject had been more typical, that he had gone through school playing the strategic grade game in all of his courses. He could have made high grades without really learning anything.

Maybe you don’t care about chemical engineering, physics, or putting satellites in orbit. That’s not the point. No matter what ambitions you may have, good grades don’t necessarily tell us what you know or what you will be able to do with that understanding. Later in the book, we’ll explore how someone could get an A and still not understand motion, but for now, just bear in mind that good grades don’t necessarily mean you really comprehend anything. In school, we are often asked to memorize lots of stuff that has no influence on our subsequent lives.

Imagine for a moment a different world, a place in which students find deep meaning in everything they learn. In that universe, learning changes who people are and how they view the world. It makes them into better problem solvers, more creative and compassionate individuals, more responsible and self-confident people. Students are able to think about the implications and applications of what they learn. Not afraid to make mistakes and full of questions and ideas, the citizens of this place easily and happily explore new areas with ease while possessing a deep humility about how complex their world can be. Learning remains an adventure. Someone may forget a few facts but still know how to find them when needed.
Such a world does exist for some people. But everyone faces increasing pressures in college and life to learn only for the rest or for someone else. Straight A’s in high school or college are great, but—and this is a big qualification—they say little about who you are, what you are likely to do in life, how creative you are likely to be, or about how much you understand. Of course, even if you didn’t get good grades, we still don’t know much about you.

We have seen five types of students in college:

1. Those who receive good grades but become no more productive than their friends who receive C’s and D’s;
2. Those who receive good grades and who become deep learners, adaptive experts, great problem solvers, and highly creative and compassionate individuals;
3. Those who receive mediocre grades but someday achieve phenomenal success because they did learn deeply, despite their transcripts;
4. Those who receive poor marks, give up, and live a life that is largely dependent on others;
5. Those who receive poor grades but tell themselves (without much evidence) that someday they will shine.

Sure, high marks have their rewards. An excellent academic record can serve anyone well in our society. Later in this book, I’ll spend some time helping anyone learn how to achieve an A, but if we had to choose between good grades or deep learning, I’d pick the latter every time.

Fundamentally, we want to promote deep, passionate, joyous, and creative learning. Grades are important, but anyone who concentrates just on making straight A’s will probably not become a deep learner. Anyone who concentrates on deep learning, however, can make high marks. We will show you how that can be done.

We have two major sources for our advice. First, we pored over the research and theoretical literature on good students. Thirty to forty years of research have told us a great deal. We paid attention to some of those studies but not all of them. Some of that literature measures good students by their grade point average, and as we’ve already seen, that doesn’t tell us much. Another group of researchers, however, has looked primarily at students who became deep learners. You will see their studies and ideas reflected here.

Second, we interviewed several dozen people who have become highly successful and creative people, good problem solvers, and compassionate individuals: physicians, lawyers, business and political leaders, computer scientists and artists, musicians, mothers, fathers, neighbors, Nobel Laureates, MacArthur “Genius Grant” recipients, Emmy winners, and a few current college students. We share some of their stories: some funny, some sad, but all inspiring.

Integrating Your Abilities and Finding Your Passion

“This is a class,” Paul Baker kept saying, “that assumes you are interested in the work of the mind.” Sherry hardly noticed the guy sitting next to her—a future pro football player—as they both listened intently. Creativity can come in any area, Baker explained, not just the arts. “It could be a sermon, a scientific formula, or a book, but it could also be something you build, a well-planned street system, a beautiful meal, or a well-run gas station.” Engineers, scientists, physicians, musicians, real-estate brokers, lawyers, historians, hairstylists, and others can all become creative people in their own field. A work of the mind, Baker concluded, could be anything fresh and innovative.

Her professor said something that day that startled most of the
class, but Sherry found it intriguing. “A lot of people I know died when they were juniors in high school,” Baker declared. “They’ve got the same concepts, the same ways of looking at conditions about them, the same answers, the same emotional and visual images and pictures that they’ve always had; there has been practically no change in them.”

He invited Sherry and her classmates into a different kind of future, one in which they came to know themselves, and out of that knowledge learned to create and grow. “I hope everyone in this class will decide to take control of their lives, to reach inside themselves, to explore who they are and what they have, and learn to use those inner powers.” He paused and looked at the people sitting in the back row. “Not for success, not to be seen; that’s not important. What is important is that you fulfill your own personal need to keep growing.”

To be creative, he emphasized again and again, you must understand yourself, including your strengths and your weaknesses. You must learn to integrate your abilities, to train them to support each other. To do that, you must open up a dialogue with your inner self. Baker asked the students to keep a notebook handy to record their reactions to the exercises. “Write out your life story up to now, and write your reactions to everything we do.” Write in pencil, he told them, “or with crayons. Whatever suits you.” Most important, examine yourself and how you work. “Get used to the pattern by which things come up in your mind and in your imagination. Find out when and at what times of the day you work best and what motivates you.” Is it anger or serenity? Do you want to prove someone else wrong? “What sort of inner needs do you fulfill?” he asked.

Everything you create, he told the class, will come from inside you, so you must know yourself. That’s the reason you must write your life story and learn to talk to yourself, to find out what’s inside you, and to discard the parts that are old and stale, and enhance and use the elements of yourself that are unique, beautiful, and useful.

Every day thereafter the class began with physical exercises “to get the blood flowing,” Baker told them. “I cannot work with you if you are tired and listless,” he said. “I want the blood flowing and your mind sharp.”

Years later, long after she had helped redesign cities, published a novel, made television documentaries, and worked on projects around the world, Sherry recalled how this phenomenal learning experience began to unfold. Baker talked about work and told the students they had to find out what kept them from working. Write a paper, he said, on your resistance to work. Explore your habits. Think about some really creative work you did in the past, and ask yourself what you had to do before you did that work. What conditions? What mood? Did you put your feet up? Walk around? Look out the window? Did you need a closed space with no distractions? An open area? Where did you go? Visualize yourself working and then go do it. “I have to eat ice cream first,” he confessed.

“Faulkner,” he told the class, “climbed up a tree quite often. He also spent hours with his shoes off, sitting down by the magazine counter of the local drugstore listening to people come and go. And it is said that he wrote all of *As I Lay Dying* while perched on the back of a wheelbarrow stoking a furnace at the University of Mississippi.”

The goal is not to do what Faulkner did, but to understand yourself: to explore who you are, how your mind works, and what keeps it from working. This course, he told the students, is fundamentally about you. It will explore the ways you react to work and acquaint
you with yourself so that you will know what you can bring to the
table. "Many times you may wake up at three o’clock in the morn-
ing, and you should get up then and work. If your mind is alive and
vital, get up and work. What’s the loss of a few hours of sleep if you
can do something?"

Maybe you have to scare yourself into working, Baker mused. Think
about what it will be like when you are old, when you ap-
proach death. Will you have already died inside or will your mind be
alive with new ideas that are unmistakably your own?

First, you must learn about yourself. Next, find a great creative
work of the mind that excites you: see its reflection in others and in
yourself, probe behind that work, seek its inner nature, and explore
the possibilities it suggests. Then find your own passion and let it
drive you. "If you are not capable of excitement, you will never pro-
duce anything," Baker warned.

Sherry shifted slightly in her revolving chair and took a fleeting
glance around this strange place in which she found herself. On
these four stages in the years to come, she would see a dazzling ar-
ray of lights and sounds, a mind-popping potpourri of scenes that
would swirl about the audience in an array of colors and textures,
lines and rhythms, and silhouettes and sounds. These performances
would blend movies and live actors, breaking all the rules of drama
and bending her senses. Hamlet would appear as three charac-
ters, all of whom would trot about tilted stages that rose from the
back, allowing audiences to look down upon the drama as they
spun in their chairs to follow the course of the play. Action never
stopped. No curtains dropped to cut the movement. No barriers ex-
isted across space or time, only action, constantly pouring around
the room.

But for now, she focused on the words of a single man, perched

upon the edge of one of those four stages and speaking in a way
that both bothered and comforted her. Baker warned the students
that good ideas or results don’t come quickly, or only to a few select
people. If you want to learn something, you have to keep working
at it. You must explore, probe, question, relate, brush aside failure,
and keep going, ultimately rejecting the easy first answers and ap-
proaches. You must keep looking for something better. Don’t worry,
said, that your first efforts will be pretty “skinny.” Better things
will come with work. “When I was a boy,” he told them, “I was a
catcher on the neighborhood baseball team. Before I graduated
from high school, I must have thrown down to second base hun-
dreds of times until I could hit a spot” with precision. “But I had to
do it over and over again until it was in my muscles.” Think about
how many times it must take to produce a piece of work with “real
maturity” and value.

After class that first day, Paul Baker asked Sherry Kafka and a
few other students to go for coffee. They walked next door to one
of those old-fashioned drugstores with a U-shaped lunch coun-
ter where a sprinkling of students sipped soda concoctions while
perched upon round red stools. Baker pulled out a form that Sherry
had filled out about herself. “I see you want to be a writer,” he
noted.

“No sir,” she shot back. “I am a writer.” Baker laughed, but not in
a mocking way, only to recognize and appreciate her confidence. “I
wasn’t trying to be a smart aleck student or anything,” she said later,
“I was just trying to be accurate. It wasn’t that I chose to be a writer;
that’s just what I had become."

But how did Sherry and other students who took that course
later become such creative people? What can you learn from their
experiences about your creative self? For Sherry and for hundreds
of others who took that magic course, the most powerful ideas emerged from a new vocabulary that Baker gave them, the validation of their own uniqueness, and the exercises they performed to explore those ideas. I share some of the details of those exercises and concepts to help you see how unusual the road to creative development can be, and to introduce you to a simple yet powerful way of thinking about creativity. What the students in Baker's course learned summarize some of the major ideas we’ll encounter throughout the book.

Every creative act, Baker insisted, works with five elements: space, time (or rhythm), motion (direction or line), sound (or silence), and silhouette (or color). “Those five elements have always been a part of my thinking on any project I do,” Sherry noted. “They became a universal language for the creative process.” We’ll see the same elements in the creative work of all others we explore, whether they were in the arts, business, engineering, science, or in law.

To help people explore those elements and to understand themselves in relation to them, the Integration of Abilities course invited students to participate in a series of exercises over a fifteen-week semester, and in each case to write about their inner reactions to them. In the first, they simply walked across a stage twice, once to express tragedy and once to express comedy, using the moments of that experience to think about how they thought about and used space. “There is no right or wrong way to do it,” Baker instructed, “and you will fail only if you do not use the exercise to learn something about yourself.”

In the second, Baker gave students a word and asked them to write whatever came to mind: he asked them to let the thoughts in their conscious mind flow like a stream and to record those thoughts with no concern about form or the rules of writing. He also showed them a simple line drawing and asked them to start drawing. “Do both everyday,” he insisted, “and date your pages so you can go back to them and study your own pattern of thinking.”

For the third exercise, Baker asked the students to analyze someone they had known for a long time. Students were to explore the background and origins of their subjects, how they lived and their rhythm in life, and, finally, their values and basic philosophies. Did their subjects come from a city or farm, from a big town or small one? What makes them tick? What do they do for fun? How do they work, walk, sit, and talk? What colors do they wear? Take everything you learn about that person, Baker instructed, and reduce it to a rhythm you can clap with your hands. You already have the ability to understand rhythm, he reminded the class. “You’ve been doing it all your life since you were lying in a crib, and you understood who was picking you up by the rhythm of that person.”

But don’t just jump to the rhythm, he warned the class. Anyone can clap their hands in a certain way. That’s easy. Instead, use the study to explore your own way of thinking. How do you react to people, and how are all of the elements you discover integrated in the life of an individual? Most of all, how did you create something original? To work through this task, you must stop being concerned about results. Immerse yourself in the process and through that exercise build a new life.

In the fourth exercise, students picked an inanimate object from nature and began writing descriptive adjectives about it—about its color, texture, lines, mass, and maybe rhythm. They looked at it from different angles and in different moods, and wrote as many words as they could imagine. From there, they began to give it a rhythm, and from that rhythm they created a character, a person who began to act. They wrote dialogue for their character and cre-
ated a scene with words, a space that reflected the nature of the character. "About fifteen or twenty times during the distilling process," Baker told them, "you are going to get a quick result. Every time you do so write it out and go back and make yourself start over." He reminded them again to cease being concerned with results and to engage in the process. "When you are building a new kind of life for yourself, this process of discovery is the key to growth." Don't rush to a fast answer or a quick result, he concluded.

In the fifth and culminating exercise, the students found an object with several different kinds of lines in it, and they drew on paper those lines they liked. A tree limb, a jagged rock, a flower, anything with complex lines. Then they began to walk out the lines, and to feel the rhythm they encountered and the colors and sounds they might assign to different lines. They began to find out which lines pleased them and which they might discard. They might enlarge some lines as their muscles responded to them and toss aside other, less attractive ones. Baker asked the students to let their muscles, to let their physical responses to line and rhythm dominate their reactions, pushing aside entirely any intellectual judgments. This final exercise extended over several weeks, during which the students would produce various works of art that extended out of those lines that they kept and expanded upon. Some would write music. Others would paint, and some would produce a sculpture. But the products didn't matter. "It is an exercise in which you are going to listen to your own muscles," Baker told them.

In all of these exercises, Sherry and her classmates found rewards not in the results they produced but in the opportunity that each exercise afforded them to explore their own thinking and how they responded to space, time, color, sound, and silhouette. No one cared what their exercises looked like, only that they used them to have this inner conversation with themselves. Out of these crazy activities, they slowly realized the unique qualities they could bring to any of these dimensions. They began to value the creative process as the central core of their own education, and to see that while it could find expression in the arts, it could also appear in a chemical formula, a new way of looking at history, a fresh way of providing medical services, a new surgical method, a cure for cancer, a well-planned park, a creative meal, or even in what you do with your money.

Each exercise helped students see that the genius to create started both within themselves and in their appreciation of the great works of the mind from others. "I realized," one of those people reported years later, "that an important part of being creative was recognizing good ideas and beautiful creations when I encountered them and finding ways to make them my own." But it also meant—and this was crucial—rejecting the obvious first answers that tradition has given us and pushing for something fresh.

In Paul Baker's exercises, students cultivated a sense of awe and excitement, qualities we found repeatedly in the people we interviewed. They were simply enthralled with the world, with learning, with the possibilities of reaching new levels of excellence, of finding new ways to understand or do. Their enthusiasm extended to not just one specialized area of study or profession but an array of subjects, often mixing the arts and science, Latin and medicine, history and comedy, or journalism and justice, to name a few. With almost childlike fascination, our highly creative best students tackled the unknown, rejecting the commonplace and pursuing their own works of the mind. They found the motivation to do so within themselves and took control of their own learning. Later in the
book, we'll explore the power of what psychologists call intrinsic motivation, the stuff that comes from deep within you. Such a power—and here's the catch—can wither and die if you let extrinsic motivators—grades, rewards, prizes—overwhelm you and make you feel manipulated.

These best students also learned that nothing is easy. Growth requires hard work. The world is a complex place. We all become creatures of habit in the ways we think and act. To learn is to strip away those deeply ingrained habits of the mind. To do so requires that we push ourselves, that we keep building and rebuilding, questioning, struggling, and seeking.

In fact, this is one of the major differences we found between highly successful students and mediocre ones: average students think they can tell right away if they are going to be good at something. If they don't get it immediately, they throw up their hands and say, "I can't do it." Their more accomplished classmates have a completely different attitude—and it is largely a matter of attitude rather than ability. They stick with assignments much longer and are always reluctant to give it up. "I haven't learned it yet," they might say, while others would cry, "I'm not good at" history, music, math, writing, or whatever. Traditional schooling rewards quick answers—the person with the hand up first. But an innovative work of the mind, something that lasts and changes the world, demands slow and steady progress. It requires time and devotion. You can't tell what you can do until you struggle with something over and over again.

The high achievers we studied learned that to get themselves to work, they must believe that they can do it—even visualize themselves doing it—and they must understand themselves. "How do you work best?" they asked themselves. How can you motivate yourself?

All had learned the power of intrinsic motivation over working for rewards like grades and honors. "Grades never mattered," they told us. Everything stemmed from an internal desire to learn, to create, and to grow. "Based on my life experience," Neil deGrasse Tyson noted, "ambition and innovation trump grades every time."

Sherry and her classmates began to see that they were responsible for their own education. Don't do it for the teacher, they learned, do it for yourself. Do it because it serves your need to grow. "I came out of that class," she reported years later, "understanding that I wasn't going to school for my teachers. They didn't live my life. I was the only one responsible for who I was going to be."

Growing the Creative Life

We can begin to see the unfolding of this creative life in people who never went through Baker's course, yet ultimately experienced something similar. Liz Lerman became one of the most celebrated and innovative choreographers in American theater, blending politics and science, soul-searching and personal meaning-making, the experiential with the fanciful. In thousands of dance performances around the world, the Dance Exchange shattered the lines that divide art and science, public and performers, learning and entertainment. Until recently she had never heard of Paul Baker, but she has independently developed similar exercises to spark the imaginations and creativity of business leaders, politicians, educators, and others. In the context of her exercises, as Nobel Prize–winning economist Paul Samuelson put it, "Good questions outrank easy answers."

Liz came from a certain house and a certain soil, from a certain family at a certain time. She grew up in Milwaukee, where her father instilled in her a quest for justice, and where she learned
to dance and find fascination with political history and its never-ending struggles between privilege and equality. As a child, she built a rich fantasy world with dolls and later with characters from historical novels. "I read all these books," she said, "biographies and historical novels, and at night before I went to sleep, I'd create these amazing stories, using people from those books."

In that world along the shores of Lake Michigan, where in the winter snow piled up like frosting on a cupcake and children frolicked in an urban water spout on a hot August afternoon, Liz struggled to find meaning and purpose in life, to mold her own values, and to find a place and a way of thinking that would give her life meaning. The lines of her life were often straight, like the grid of streets that crisscrossed Milwaukee, but sometimes they cut at odd angles, like Muskego Avenue, or curved gently along the shores of Milwaukee Bay. Her rhythms came from the seasons, from the parade of ward politics that engaged her father, from the sounds of the city, from dance classes, and from the ancient patterns of religious commitments.

Liz went to school on a dance scholarship at Bennington College in Vermont, where the lines ran up and over hills, not like the flat pancake of land and water that hosted her youth. Milwaukee and the lake had been like a stage upon which the players of her real and fantasy life danced to the music of politics and religion, where Liz had struggled with how she could both dance and "do all the things my father wanted me to do in the world, to fight social wrongs, to create justice," where she had wrestled for "several years" with the "whole question of God." In Bennington, the lines and patterns changed, and so did the space and silhouette, the sounds and rhythms.

"I had a checkered college career," she remembered. "I transferred to Brandeis after two years, got married, and then divorced before dropping out for a year." Liz went back to school at the University of Maryland, where she graduated after another year, and then got a master's degree from George Washington University. Along the way, she had a few memorable learning experiences. At Bennington, a history professor had given her a question and some historical resources, and asked her to draw her own conclusions and write a paper about it. "That was the whole course," she recalled. "My professor met with me twice a week to see if I had any questions. That's where I learned to choreograph, to find my own voice." Later at Maryland, she took a course in improvisation that helped free her to make mistakes and learn from them. Most of all, she loved to explore. "I could spend hours back in the stacks of the library just pulling books off the shelf, letting myself go."

In the years after college, Liz found her own creativity in the experiences of her life and in her ability to explore them. She recognized the unique combination of lines, space, motion, time, and silhouette that poured into her existence and that allowed her to address "topics of cultural, social, and historical importance." She staged acclaimed dances about "the defense budget and other military matters," and her company celebrated the centennial of the Statue of Liberty with a giant production on an outdoor stage in Manhattan. Rather than denying and repressing the fantasy world of her youth, she eventually freed it to soar in the heavens.

How did she do so? In the chapters to come, we will explore how our highly successful individuals realized their visions.

In general, the individuals we chose realized their uniqueness, defined their values, and found a purpose and meaning for their studies and lives. We will see how they used that purpose and meaning to build powerful engines of motivation that produced magnificent results. They found within themselves a way to motivate their work. That intrinsic motivation became their driving force. We will come
to understand the power of intentions, and how much they determine outcomes in life. They developed a flexible mindset for themselves in which they came to appreciate their unique qualities, their strengths and weaknesses, and their capacity to grow. We will explore how such concepts of growth helped people to keep trying even after mistakes and missteps. We will see how they came to deal with failure and to use it productively.

These highly productive and creative individuals think about their own thinking while they are thinking. That process, called *metacognition*, allows people to engage in a valuable conversation with themselves, exploring their background, questioning and correcting their thinking in process, and pursuing the dynamic power of their own minds. They also appreciate the messy quality of life and its great questions and the difficulty of drawing conclusions. We will explore an approach to critical thinking that allows the best students to confront and think meaningfully about difficult problems and to become adaptive in their expertise, in this way experiencing Baker’s highest level of growth.

They are able to comfort themselves and find personal tranquility, even in the face of the most distressing and potentially depressing developments. These individuals also possess an enhanced capacity for empathy. The capacity for self-comfort—more than any notions of self-esteem—allowed them to confront their own weaknesses and look for areas of growth. All these individuals live balanced lives and learn from a rich assortment of fields, rather than from one narrow discipline. We will explore the power of a broad education, and how our subjects used that kind of learning experience to grow their minds and become highly creative, compassionate, curious, and critically thinking individuals, better able to confront adaptively all of life’s challenges.

Finally, those we studied confronted rather than avoided the questions that allowed many of them to shine academically. In a final chapter, we will explore how people can both learn deeply and make high grades. But more than that, we will examine how they read, studied, and learned to write in ways that enabled them to grow their own minds, make significant contributions in the world, and find meaning for their lives.

Opening a New World

Ernest Butler grew up in a series of small towns in east and central Texas, where his parents taught in the local schools. Like many small-town boys in that state, he lived close to the land, helping his parents farm a few acres on the edge of town. He cared for a cow or two and absorbed the rhythms, lines, and textures of a flat country. He learned to get up early to feed animals and perform other chores (an early rising habit he carried into college), and he learned to play the clarinet because he liked Benny Goodman’s music.

Sarah Goodrich grew up in San Antonio, Texas, a city with a strong Hispanic heritage and culture. Nearly half of the people in the city spoke Spanish. In that environment, Sarah became intrigued with Spanish culture and language, and wanted to follow her mother as a schoolteacher. She was an only child, and in the summers she would travel with her parents down to Saltillo, high in the Sierra Madre Mountains in northern Mexico.

When Sarah and Ernest graduated from high school, they went off to college and eventually found themselves taking Paul Baker’s Integration of Abilities course together. “It opened up a whole new world,” they reported later. “We discovered the theater, music, architecture, and creativity.” In college Sarah studied education and
Spanish. Ernest focused on chemistry, took more history classes than he had to, and planned to go to medical school. Yet they both found in that course a life-transforming experience, an exploration of the arts and creativity that influenced nearly everything they did thereafter. Like so many other students who moved through Baker’s classroom, they began to see how a work of art challenges your thinking, how it stimulates your mind. Most of all, they began to discover themselves and their own creative abilities.

Ernest did go to medical school after college, and he and Sarah got married. He became an otolaryngologist and eventually set up a practice in Austin, Texas, where he would create what became one of the largest single-practice ear, nose, and throat clinics in the country. A few years into his practice, he bought a failing company that made soundproof rooms where people’s hearing could be tested and turned it into one of the largest businesses of its kind in the world. The company branched out into practice rooms for musicians and radio broadcast booths. Sarah taught Spanish in high school, lived a few summers in Spain, and along with Ernest became active in the local arts community. They both enjoyed exploring works of art that challenged their thinking. Together, Ernest and Sarah helped transform the world of music, dance, theater, opera, and museums in central Texas. They gave their time and their money, showering millions of dollars on art museums, scholarship funds, recital halls, awards for outstanding teaching in the sciences, and other enterprises. In one magnificent philanthropic gesture alone, they gave the University of Texas at Austin $55 million dollars to endow the School of Music. They gave away much of their fortune to support the beauty, integration, and challenge that comes from works of art.

Yet the lessons they learned about themselves in college, and the creativity they developed in a course that “opened up a whole new world” found its greatest expression not in the number of dollars they poured into the community, but in the people they became, in the values and attitudes they developed, in the humility with which they approached their wealth and good fortune, and in the creative way they used it to bring the power and beauty of the arts to other people. Since their days sitting in those revolving chairs in the Studio One Theater, Ernest and Sarah had learned to integrate the arts into every aspect of their being and to feel the harmony between various art forms and their own lives and community. When I asked Sarah if they had a large collection of art works in their home, she quietly responded, “Oh, no. That would never do. We’ve lived in the same modest tract house for years, and not enough people could see a large collection here. We’d want to share art with everyone. We’d put it in a museum so it could become a part of the community.”

Genius Identified

One day while Will Allen was cutting lettuce from his garden, the telephone rang. When the tall urban farmer and former professional basketball player answered, a man on the other end asked, “Have you ever heard of the MacArthur Genius Award?” Will confessed that he hadn’t. “We’ve been following you for about three years,” the man continued, “and you are one of the winners this year. You will receive half a million dollars over the next five years, and you can do anything you want with it.” Several years later, Will admitted that he almost hung up on the caller. He didn’t realize that the MacArthur Foundation annually selects a few people who have been doing highly creative work, calls them out of the blue, and offers them $500,000.
Will, like Liz, also came from a certain soil and a certain family. He used his roots in that land to create one of the most ingenious and promising urban experiments in the world. His parents had been sharecroppers in South Carolina but had moved to southern Maryland outside Washington, D.C., where they survived on a small farm. “We didn’t have much money,” he remembered, “and couldn’t buy stuff, but we always had plenty of good, nourishing food that we grew.” When he was thirteen, he learned to play basketball by tossing a peach basket to an old oak tree and taking aim. The lanky six-foot six-inch teenager progressed rapidly in the sport, and he soon became one of the top young players in the country, a high school All-American for three years. With offers from more than one hundred schools to play college ball, he chose the University of Miami. He was the first African American to play on the intercollegiate basketball team at the South Florida school.

A neighbor had taught him to read even before he went to school. Years later, he still remembered going with her to see a production of Shakespeare’s Othello, and still felt moved by the power of that story. Until he entered the sixth grade, he had attended segregated schools in Montgomery County, Maryland. “We got hand-me-down textbooks from the white schools,” he remembered. “Some of the pages were missing and many of them were marked up. You couldn’t read them very well.” When he went to Miami, a “few Klan people objected, but for the most part it went pretty smoothly.” He majored in physical education and sociology, but also took more courses in history than required simply because he found it fascinating. “When I played professional ball in Belgium after college,” he noted, “that knowledge of European history came in handy.”

When he left his parents’ farm to enter college, he swore he’d never go back to that kind of work. As a youth, he’d had chores to do every day before he could play any sport—chopping wood, weeding a garden—and he thought that going to college would free him from that life. But it was not until he learned to draw on his farming heritage that he found the creative activity that would win him both the MacArthur Fellowship Award and the Theodore Roosevelt Award, the “highest honor” the National Collegiate Athletic Association (NCAA) confers on anyone. Four presidents have won the “Teddy,” as it is called, and so have senators, secretaries of state, astronauts, and a famous heart surgeon. The first recipient was President Dwight D. Eisenhower. Will Allen won it for being an urban farmer.

When he was in Belgium playing professional ball, he had gone with a teammate to a family farm to help plant potatoes and had discovered “a hidden passion for farming.” After he returned to the United States and spent some time in business with a Cincinnati company, he started farming outside Milwaukee, where his wife had grown up, and eventually took over the last remaining farm within the boundaries of that midwestern city. On that two-acre plot he created a revolution drawn from his own history and values.

Will founded and became the chief executive officer of Growing Power, a nonprofit corporation intended to address one of the fundamental problems of urban living. In big cities around the world, people don’t know how to grow their own food and usually think they can’t. They depend on large corporations to provide them with the stuff they eat, often grown under conditions that can’t be sustained forever because of the damage it does to the environment. From that system, city dwellers often dine on synthetic products, more chemical concoctions than organic nutrition. In addition,
people without jobs in an urban area have no means to support themselves. Will’s nonprofit company teaches them how to produce their own food, even in a big city.

At its home base in central Milwaukee, that two-acre plot would eventually contain the first of a series of community food centers. These centers experimented with new ways of growing food and partnered with local people to help them produce their own. “In a space no larger than a small supermarket,” the website proclaims, “live some 20,000 plants and vegetables, thousands of fish, and a livestock inventory of chickens, goats, ducks, rabbits, and bees.”

In both Milwaukee and Chicago, Growing Power trains people to grow their own food, using methods handed down for generations and cutting-edge approaches that adjust to an urban environment. Satellite training stations have emerged in several states across the South and in New England. “These systems,” the organization states, “provide high-quality, safe, healthy, affordable food for all residents in the community.” Current plans call for the creation of an innovative five-story vertical farm.

The creative genius behind this revolution simply followed the same pattern that the Integration of Abilities course taught its students. Will Allen looked within his own life and drew from that experience. He analyzed urban space and the time it takes to grow and distribute food, and thought about ways to employ the space and time as no one had done before him. He started Growing Power’s dramatic experiment after kids from a gigantic low-income housing project asked him for help in producing their own food. He marveled at their dedication and found inspiration both in the value of helping others, which his parents had instilled in him, and from the determination of those neighborhood children. But he also learned to recognize good ideas when he encountered them. In the process of building his urban farm, he explored a wide range of technologies, from aquaponics, which grows fish and plants in a closed system, to an anaerobic digester that produces energy from food waste. Will has developed new methods of composting to recycle much of the waste and create a sustainable system of farming that doesn’t depend on chemical fertilizers, and he now teaches those methods to others. This “Farmer-in-Chief” runs a company with a six million dollar—and expanding—an annual budget.

The sharecropper’s son who started and runs the nonprofit Growing Power appeared in Time magazine’s list of the 100 most influential people in the world. He was invited to the White House to help First Lady Michelle Obama launch a program to reduce teenage obesity, and he now counsels universities and community leaders on urban farming. He is a highly respected voice on national and international food policies and emerging agricultural technologies. When he received the Teddy, he told a reporter, “I really value this award, because it shows that student-athletes can aspire to be more than just entertainment symbols for people.” Clearly, he valued his days playing a team sport, and he told me he used that experience to learn how to build the personal relationships that made Growing Power a major player in an important urban movement. “It was,” he concluded, “the single most influential experience I had in college.” And yet he also said, “You can do something positive with your life to impact other people’s lives in a different way than just having them watch you play a sport.” When I asked him about his most important creation, however, he didn’t mention his contributions to urban farming or his basketball career. “I helped my wife rear three wonderful children.” Creativity comes in many forms.
2

WHAT MAKES AN EXPERT?

When Jeff Hawkins was growing up on the north shore of Long Island, years before he designed a small computing device that changed the world, he and his two brothers and his father invented stuff, mostly wild-looking contraptions that floated. “My house was a little like the old movie You Can’t Take It with You,” he later reported. At dinnertime, the boys and their father wolfed down their meals and went immediately to the gigantic garage that seemed larger than all the rest of the house put together. In that magic space, they tinkered with plastics, metals, and woods, fashioning a crazy boat that looked more like an alien hovercraft than like any of the usual sailing vessels that plied the waters of Long Island Sound on a Sunday afternoon.

When he wasn’t building stuff, he would ride his bike to the library to look up information on history, society, or science. He became fascinated with books on mathematical games, and in high school he joined the math team. Jeff also became intrigued with magic, not just to perform some mystifying trick to baffle his friends, but to understand how people could be fooled by something that so obviously contradicted everything he understood about the universe. He built models in his mind of how the world worked, and if anything challenged those models, he wanted to know why. This future giant in the computer industry became interested in music for much the same reason—not so much to perform but to find out why various sounds would appeal to different people. Why would certain music move you? Why would someone listen to certain patterns of sound and not others?

By the time Jeff entered Cornell as an eighteen-year-old freshman, he had made a list of four great questions he wanted to pursue. First, why does anything exist? “Nothing seems more probable than something,” he explained long after he had fathered the first successful mobile computing device and helped build Palm and Handspring into billion-dollar corporations. Second, given that a universe does exist, why do we have the particular laws of physics that we do? Why is it that we have an electromagnetic field, or that E = mc²? he mused. Third, why do we have life, and what is its nature? Finally, given that life exists, what’s the nature of intelligence? “In my lifetime, I expected at least to answer the last one,” he explained.

Jeff received good grades but never placed at the top of the class. “I did what I had to do in a class,” he said, “but I didn’t freak out about making the best grades.” He usually sat in the front row, paid attention, and did the work, but he focused on what fascinated him. Because simple answers never satisfied, he probed for deeper explanations. “In magic that meant asking not just how the trick was done, but also about how anyone could be fooled by it.” In history, it meant hunting for causes and consequences; in engineering, for how and why something worked. Yet he also discovered that for many of the subjects he pursued, there was no place to “look it up,” no simple answer.

In college, he didn’t have any great teachers or life changing courses, but he enjoyed his freedom and soon discovered two loves: physics, and the girl he would later marry. “Having someone else in my life made a huge difference,” he reported.
What Makes an Expert?

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He also discovered something else about college. Other people set much of the agenda. "The problem in college," he observed, "is that your interests don’t always line up with what you’ve been assigned to do." So he did what he had to, even if it wasn’t his first choice. When that was done, he then went after the questions that fascinated him. "If I had an assignment, I did it, but I pursued thoroughly those things that really intrigued me."

And it was in those pursuits that he took a deep approach to learning, asking in every field why and how, and trying to connect everything together. Most important, he continued to build models of the world in his own mind. "You can build models in math," he noted, "but you could also do it in music, in business, and in engineering." Since childhood, Jeff had been building those patterns, those abstractions that allowed him to understand the world. Now, with the increased knowledge gained in college, he could piece together even more sophisticated ones. He began to theorize from what he learned, to develop concepts, to imagine possibilities and probabilities. Jeff toyed with life, arranging the pieces one way and then another until—from the shadowy world of impressions, confusion, and contradictions—new insights began to emerge.

**Styles of Learning**

We live in the midst of some monumental changes in everything we thought we knew about who can do well in school and life. Thirty-five years ago, we thought that people like Jeff Hawkins were an oddity, beyond the reach of mortal students and perhaps a creation of personality, superintelligence, or a mysterious quirk that most of us will never understand. Yet a large and growing body of research suggests that not only can most students achieve Jeff’s style of learn-
ers usually focus only on passing the exam, not on ever using anything they read.

Meanwhile, other students expressed much different purposes. They wanted to understand the meaning behind the text and to think about its implications and applications, to search for arguments, and to distinguish between supporting evidence and conclusions. These students tried to comprehend what difference an idea, line of reasoning, or fact made, and how it related to something they had already learned. In short, these “deep learners” approached the piece with all of the enthusiasm of a five-year-old on a treasure hunt but with the added skills of analysis, synthesis, evaluation, and theorizing.

In the years following that first study, social scientists have identified a third style of learning that students will take. “Strategic” learners primarily intend simply to make good grades, often for the sake of graduate or professional school. These people will usually shine in the classroom and make their parents proud of their high marks. In many ways, they look like deep learners, but their fundamental concern is different. They focus almost exclusively on how to find out what the professor wants and how to ace the exam. If they learn something along the way that changes the way they think, act, or feel, that’s largely an accident. They never set out to do that. They simply want the recognition that comes from graduating with honors.

The Perils of Surface and Strategic Intentions

Although making the dean’s list sounds great, strategic learners seldom become risk-takers because they fear something new or extra might mess up their grade point average. Thus, they rarely go off on an intellectual journey through those unexplored woods of life, riding their curiosity into a wonderland of intellectual adventure and imagination. They approach college with a checklist rather than with any sense of awe and fascination. As a result, these students often learn procedurally rather than conceptually, following the steps to a calculus problem but understanding little of the ideas behind it because they never intend to do so. To be fair, some of these students are innocently strategic because they’ve been taught to think of learning in this way. All of them have come to their strategic approach because of conditioning, as we will see shortly. As a result, they can’t transfer that problem-solving to a different example involving the same concepts. Strategic learners can plug the right number into the correct formula on a chemistry or physics exam, or put the right words in a properly constructed essay, but it all has little influence on how they think, act, and feel.

Later in life, they may become, at best, what some Japanese theorists called “routine experts,” learning all the procedures of their work but seldom becoming inventive. When the problems of life don’t follow the norm, routine experts seldom adjust. They have difficulty handling new situations and rarely become pathbreakers, the people who invent new ways of thinking and doing. When confronted with different kinds of problems, they sometimes retreat in frustration. Adaptive experts, in contrast, also know all of those conventional routines, but they have something else we will see in all of our best students and among deep learners in general. They possess the ability and the attitude both to recognize and even to relish the opportunity and the necessity for invention. Such experts love to take on the unknown, to tackle those really difficult problems. They enjoy and know how to improvise, invent, and overcome unexpected obstacles. Our society needs adaptive experts, whether
it is to address the ravages of climate change, fix a sagging economy, or end wars, yet strategic learners seldom provide that imaginative flexibility.

But the problems with strategic and surface learners don’t end there. They can become bored with school and suffer from major bouts of anxiety and even depression. They often don’t enjoy taking on new problems. Most important, they don’t learn much. Remember those physics students from the previous chapter, the ones who received A’s but still didn’t understand motion? They were strategic learners. They discovered how to plug the right number into the proper formula to get the correct answer on the examination, but they had little notion of what it meant. Their counterparts in English or history classes could write a five-paragraph essay in their sleep, but most of what they wrote had precious little meaning for them. Their education had at best only small influences on the way they would subsequently think, act, or feel. No wonder they approached college like a series of hurdles to jump rather than the exciting ride of a lifetime.

Perhaps I should clarify here. If you try to remember something as you attempt to understand it and relate it to other topics and questions, that is fundamentally different than simply trying to poke it into your brain to pass an examination. To take a deep approach means to take control of your own education, to decide that you want to understand, to create something new, to search for the meaning that lies behind the text, to realize that words on a page are mere symbols, and that behind those symbols lies a meaning that has a connection with a thousand other aspects of life and with your own personal development. Such intentions are intertwined with motivation, growing out of an internal drive but also feeding it with an important fuel and direction. The people we examined didn’t just take control of their own schooling. They created an education for themselves that would make a difference in their own lives and thinking.

I met recently with a college student who had it backward. “You’ve got a big test coming up,” I said. “You seem nervous about it.”

“Oh, I am, but I think I’ll be OK. All I have to do is memorize about twenty terms. My friend who took the class last year said that’s all there is on the test. If I can just get out of that course with a B, I don’t think it will hurt my grade point average too much.”

Notice the pattern here. When students fear failure, they often can’t sleep. They worry, then decide to memorize isolated facts, thinking that will save the day. Maybe they will succeed, pass the test, and survive the course. Maybe not. But it all becomes pretty meaningless. Nothing in this process has any lasting influence. Not surprisingly, surface learners lose their interest. Who could remain fascinated when you are consumed just with survival?

None of this means that surface learners never go deep, that deep learners don’t occasionally settle for shallow knowledge, or that strategic learners never understand anything. The research over the last thirty years or so simply indicates that students will develop strong intentions that usually guide their study and learning. They develop a style of learning that is predominantly deep, surface, or strategic, and it is this overriding intention that shapes their lives. Many students never learn deeply simply because they never intend anything more than just to survive or shine in the academic world.

Do Intentions Matter that Much?

Many people apparently still believe that approaches to learning don’t matter, and that if you just teach students good methods for
reading and studying, they will use those strategies in their school work. You can see that attitude in hundreds of "how to be a good student" books. Such manuals will show you a multitude of study tricks and other such secrets to academic success without saying a word about intentions or motivation. Of course you must develop good reading, writing, and computational abilities, and learning takes lots of hard work, but if you don’t have the intention to learn deeply, all of the skills in the world can leave you short of the mark, as the American psychologist Susan Bobbitt Nolen discovered several years ago.

In a series of studies, Nolen asked students, “What makes you proud?” Some said things like, “I feel most successful when I score higher than other students and I show people I’m smart.” She called these people “ego-oriented,” and they correspond to our strategic learners. Others responded that they felt most successful when they got a new idea, when something they learned made them want to find out more. She called these people “task-oriented.” We’ve called them “deep learners.”

When Nolen looked at students’ reading habits, she noticed that the ego-oriented often used surface strategies even if they had been taught to use better ones. They generally tried only to memorize what they read, reading it over and over and trying to remember new words. In contrast, the “task-oriented” students, those people who just loved to learn for its own sake, used much deeper approaches even when no one had prompted them to do so. They looked for basic arguments and decided which information was most important. They thought a great deal about how new information either supported or changed something they already believed, and they asked themselves constantly how well they understood the material. In short, they used strategies that were most likely to produce understanding, critical thinking, creativity, and adaptive expertise.

Nolen also uncovered another type of student. She called these people “work-avoidance” types. We’ve seen them before as surface learners. They told her they felt most successful when they could “get out of some work,” when all the “work was easy” or when they “didn’t have to work too hard.” What kind of strategies did these people use? Pretty much the same ones that the ego-oriented students had employed. In short, both the surface or work-avoidance students and the ego-oriented students—our strategic learners—used strategies for reading and learning that would seldom lead to any understanding, or, we suspect, to any innovative work.

How We Come to Think the Way We Do

If you recognize yourself in any of these descriptions of surface or strategic learners, don’t despair. You are not locked in those styles of learning. If you think you are too smart to fall into the weaker intentions, think again. We are all possible victims of surface or strategic approaches, but we can all escape them. Neither intelligence nor personality determine what kind of style students will develop. Researchers around the world have found that some highly capable people can grow surface or strategic tendencies while even average students can muster deep ones. Among our subjects, some people moved from strategic to deep approaches, indicating that the style isn’t branded in one’s soul. Both the shy and the bold can emerge as any of these three types of students.

A complex set of factors seems to drive many students toward surface or strategic approaches, and if you hope to escape them and find a deep approach, you must understand those forces. Some of
them emerge in school. If you face, for example, a steady diet of multiple-choice examinations that merely ask you to recognize isolated facts, it seems not at all surprising that you will eventually conclude that the goal in life is to memorize isolated facts, rather than search for meaning. Essay exams that expect students merely to spit back what the book or teacher told them encourage shallow, not meaningful, learning. As a former colleague put it, “If an anthropologist from Mars landed on this campus and tried to determine the purpose of a college education, she might rightfully conclude that it is to learn how to take blue book examinations.”

An emphasis on coverage rushes students through material, giving them inadequate time to contemplate deeply. Classes that entail large quantities of work can force people to look for superficial shortcuts just to survive the experience. Students often fill their lives with a variety of distractions that also deny them the time to go deep, and with the cost of higher education escalating and the amount of financial aid declining, many must work long hours outside school to pay the bills. The financial pressures to rush through school, get the degree, and get a job are tremendous. Yet schools do not bear all of the responsibility. They are set in a larger society that constantly pushes people toward the superficial and encourages students to value honors and recognition over deep understanding.

Intrinsic and Extrinsic Motivators

There is, however, something even more fundamental about schooling that tends to foster surface and strategic approaches and that produces the biggest blow to deep learning. Much of that something lies within a thought problem and subsequent experiment that two young psychologists, Edward Deci and his colleague Richard Ryan, concocted years ago. It goes something like this: Think of something that you love to do—to play baseball, read romantic novels, cook lasagna, do math problems, or study history. Suppose someone pays you to pursue that favorite activity, then later stops giving you that reward. What will happen to the level of your original, internal interest in the face of this external motivator and its subsequent withdrawal? Will it go up because you had that outside incentive, stay the same, or go down? In other words, how do rewards and punishments ultimately influence your desires?

Conventional wisdom and the prevailing social science of the day said that if you want somebody to do something, give them a reward for their work, and they will most likely repeat it in the future. Like rats in a maze, according to this popular doctrine, humans will work hardest and perform best if they have an extrinsic motivator waiting for them. But the two professors had their doubts and turned to their psychology laboratory to find the answer. Over scores of investigations, the Rochester social scientists and others have concluded that external motivators can actually reduce interest, especially if someone feels manipulated by them. In the most dramatic of those experiments, students who had been paid to do a task lost all interest while those who did it voluntarily kept working. These findings have enormous significance because if you don’t care about studying, you are unlikely to take a deep approach.

You couldn’t think of a better model for Deci’s and Ryan’s thought problem than most formal education. Even when children enter the experience full of mental excitement, wonder, and fascination, school showers them with extrinsic rewards well designed to kill any internal motivation. At an early age, people learn to work for a gold star or a good grade, and, as one of Deci’s colleagues put
it, they feel a “loss of the locus of control.” In other words, they feel manipulated. As their sense of being an independent person slips from them, their interests fade beneath an avalanche of “requirements” and “assignments.” They are no longer in charge of their own education. Their childhood curiosity often languishes and dies.

Even the structure of a formal education tends to reinforce this process. People are most likely to take a deep approach to learning when they are trying to answer questions or solve problems that they regard as important, intriguing, or just beautiful, and they can do so without feeling like someone else controls their education. In most classes, however, students usually aren’t in charge of the questions, leaving an enormous gap between the realities of schooling and the conditions that promote deep approaches. Although we can all make a good case that teachers should control the questions simply because they know more and can imagine inquiries that their students will never otherwise consider, the structure nevertheless fosters strategic and surface thinking.

Consider my niece. When she was five years old, she and I took an automobile trip from Austin to San Antonio, Texas. In the seventy-eight miles we rode down Interstate 35, that little girl asked me about seventy-eight hundred questions, constantly peppering me with one inquiry after another. For the most part, she wanted to know about astronomy. “Where’s the sun at night?” she asked. “Where are the stars during the day?” Her appetite for knowledge, like that of so many five-year-olds, knew no bounds.

Fast forward about fifteen years. My niece had just started her junior year in college, and I was anxious to hear about her upcoming semester. “What are you going to take this term?” I inquired when I saw her at a family reunion.

“A bunch of required stuff,” she muttered.

“Oh, like what?”

“I’ve got to take some science courses,” she pushed back with a grimace and sigh.

“What did you decide to take?”

“I signed up for an astronomy class.”

“Great,” I exclaimed. “I know you are very interested in astronomy.”

She looked at me like I was completely crazy. “Where did you get such an idea?” she asked incredulously. Something tragic had happened to her since that car ride so many years before. She had gone to school. In the process, she had lost that childhood curiosity that had so animated the five-year-old days of her life. It’s an all-too-familiar story.

Yet every member of the group we studied went to school, and each eventually emerged as a highly inquisitive and productive person. Indeed, their ability to remain or become curious despite formal education became a key ingredient in their flourishing as critically thinking, creative, and adaptive experts. How did they do it? Across the conversations I had with extraordinarily accomplished individuals, it became clear that they had managed to ignore extrinsic motivators like high marks and to find intrinsic reasons for their studies. Many told me they didn’t care about grades, except for what those marks said about their thinking. “I’m moved,” Neil deGrasse Tyson confessed, “by curiosity, interest, and fascination, not by making the highest scores on a test.” Many of the men and women we interviewed had achieved considerable fame and fortune, yet neither of those gods seemed to drive their work either.

Let me clarify. Strategic and surface learners display little interest in understanding anything. They just want to survive or shine, and for them, grades represent nothing more than a passport to some-
thing else, a ticket to survival, or to fame and glory. Grade point averages are like points in a card game that can get you somewhere else. You play the game of school to win against your competition, not to learn. Not surprisingly, grades often feel manipulative to these students. They feel little sense of control over their own education. In contrast, deep learners in general might have some interest in grades, but only to the degree that they convey useful assessments of their work and abilities that they could use to improve. With a teacher whom they respect highly, they might anxiously await the grade because of what it represents, but they are most interested in the substantive feedback to their thinking and work. They aren’t interested in the grade per se but in what it says about how well they are thinking and acting. “Keeping up their grades” means maintaining high intellectual or artistic standards. Grades offer a simple shorthand for something more substantial, and deep learners focus on that higher-order meaning rather than the symbols themselves or their “point value” in a competitive game. Motivation remains intrinsic.

Even when someone in our study of deep learners paid attention to her grade point average, as Debra Goldson, a physician in New Jersey, confessed doing, she still didn’t lose sight of her primary learning objective. Grades never became her motivation. For Debra, her focus remained on understanding what would help her become an excellent physician, and that is what pushed her through school.

How did these people dodge the scourge of extrinsic rewards or escape from it after first surrendering to it? Part of their secret, no doubt, came from examining their lives and coming to appreciate the qualities and perspectives that only they could muster. Self-examination led students to understand those passions that would excite their soul and even to realize the harm that extrinsic motivators could inflict if they remained unaware of their power. They could unleash a fountain of insights into what they could accomplish, the exceptional nature of their life stories, and the potential of their special contributions. They possessed an empowering and motivating perspective on the educational process.

What did they discover about themselves? While each of our best students found his or her own combination of motives, three key factors appeared in the lives of nearly all of them.

Most basic, they rediscovered the curiosity of childhood. They puzzled over the unknown and stood in awe of the world in which they lived. They appreciated the uniqueness of their individual insights. They found the joy of standing before a body of material or an experience and wondering what it means, how it’s connected with other matters, what it implies, or how they might apply it to some question or problem. As they discovered their personal passions, our subjects found ways to build on those initial interests, constantly integrating new subjects with old ones and expanding their relevant world. These best students discovered how to explore human society, the arts, and nature, and how to find links among their interests. They tinkered with the unknown, toyed with life, and found great joy in both the work and the fruits of their labors. More of life became interesting and relevant.

Second, they found great pleasure in learning how to be creative, discovering what Paul Baker had called the dynamic power of their minds. “I studied in major part,” one person said, “because everything I learned, all the ideas and insights, helped spark imagination and made me more productive.” They found considerable motivation in just learning about themselves and how they could grow. Many of our students even became intrigued with the process of discovery and investigated how their own minds functioned and
how they could learn to improve their thinking. Each step in that
growth—success or failure—gave them marvelous new ideas about
how they could become more productive and creative. They did not,
however, just set out to become creative for its own sake. That pro-
ductive life had a purpose that drove their endeavors. They sought
to grow and use their creativity in order to address some issue or
achieve some goal that had become important to them.

Because they understood the principle that all of us are unique,
they also grasped that each of us can benefit from the special con-
tributions of other people. We can learn to integrate the insights,
perspectives, and wonderful works of the mind that others have
fashioned out of their peculiar histories. “Part of the creative pro-
cess,” Paul Baker had insisted, “is the ability to recognize good ideas
when you encounter them.” In essence, then, motivation came in
part from simply marveling at even the small accomplishments of
others, letting each triumph challenge and inspire. “I came to ap-
preciate works of art,” Ernest Butler reported, “that questioned and
invigorated the way I was thinking.”

Finding a Purpose for Education

As these best students sought to develop the power of their own
minds and to let curiosity drive their lives, those quests became
potent parts of their motivation in school, transcending grades
and honors. But that alone could not sum up what drove many of
our subjects. Most of the people I interviewed had clearly thought
deeply about the most profound questions of life. They sought a
meaning and purpose for their existence. Who am I? Why am I here?
What is my role? Out of that quest they had thought about what
they valued, the kind of person each of them wanted to be, and the
type of world they hoped to help create. We heard stories from peo-
ple who had fashioned a keen sense of justice and compassion, and
had developed the capacity for empathy. Their deeply felt values de-
fining their sense of responsibility to a larger community and helped
drive their work. For some, such thoughts rested in religious con-
vincitions; for others, they sprang from strictly personal and family
values.

Recent research suggests that most students enter college with
similar concerns about values. A seven-year study in the United
States discovered that eighty percent of entering college students
expect their collegiate experience to help them address spiritual
questions about their purpose in life, and two-thirds “say that it is
either ‘very important’ or ‘essential’ that college ‘helps you develop
your personal values’ and ‘enhances your self-understanding.’”
Much the same pattern prevailed among the highly creative people
we studied. Their lives brimmed with concerns for reason and pur-
pose, and, as we shall see repeatedly, they often found their greatest
satisfaction in struggles for social justice. They distinguished them-

48 selves because they never lost those values, and they let them drive
their academic and personal successes.

“I grew up in a family that stressed giving back,” Joel Feinman,
a public defender from Arizona, reported. “We were quite fortunate
and had accumulated considerable wealth, and my parents and
grandparents always stressed the responsibility that we had to oth-
ers. That’s what drove me in college and law school.”

As he and his brother grew up in Tucson, he heard that message
constantly, both in what his parents told him and in what they did.
They encouraged him to read but to avoid television, and stressed
the value of a good education for better understanding the world
and contributing to it. By the time he reached high school, he had
become increasingly concerned with political and social issues related to the city's history."

"My father," Joel remembered, "came from a rich New York family, but he taught us to understand the injustices that many Hispanics often face, and to do something about them. We were immigrants from the Hudson Valley, but we had wealth and didn't cross an international border to get here." The disparities he saw between rich and poor seemed unfair and even cruel, and that feeling helped foster a growing concern for social justice that increasingly drove what he learned.

Not every member of our study became as involved in politics as Joel eventually did, but many of them found similar motivations. They developed a keen concern for issues of justice, the kind of world they wanted to create, and the person they wanted to become. They became curious about the world, and those matters helped drive their studies no matter what field they explored. They didn't always win their battles against the extrinsic forces in their lives, but as we shall see repeatedly, they triumphed only when they let go of all the rewards of academic honors and other external payoffs, and let the sheer joy of learning, an interest in personal development as a creative person, and their concern for the broader society drive their performance. We'll see Joel again in Chapter 8 because of the incredible story his passion for justice began to dictate.

Taking Control of Your Education

In part, success thus comes simply from taking control over your own education, from realizing that you are in charge. Opportunities to learn matter, and without them, no one can succeed, but given the chance, our subjects had to find their motivation for working.

Stephen Colbert told me he took control of his education and began to decide what areas he would explore when he was ten years old, long before he changed the face of comedy with his late-night television show. He had grown up in a large and happy family on James Island, outside Charleston, South Carolina. In his household, learning and curiosity had value. His parents, both devout Catholics, taught their children to ask questions. His father was the first vice president for Academic Affairs at the Medical University of South Carolina.

Because Stephen came last in a family of eleven children, he received the constant attention and admiration of his older brothers and sisters. "They used the term 'adorable' so often that it almost became pejorative," he mused years later. "They were always picking me up, and carrying me around. I felt valued."

On a hot, steamy summer day, he and his father would sometimes go down to Folly Beach Pier, sit on the dock, and fish the waters after asking the locals where best to drop their line. When he was ten, however, those pleasures ended forever. His father and two brothers died in a fiery plane crash outside Charlotte, North Carolina. "After that," he once said, "I saw my job as making my mother laugh." A house once filled with a baker's dozen of voices grew still, except for the joking antics of a little boy bent on comforting his one remaining parent.

Stephen grew up in an American South that often suffered the barbs of national ridicule. On television and in films, a "southern" accent became synonymous with buffoonery and ignorance. In the popular mindset, if you spoke with a South Carolinian drawl, you obviously played with a crippled mind. To compensate, he sought refuge from this mocking and sometimes mean-spirited stereotype and deliberately set out to make himself over, purposefully and care-
fully copying the rhythms and tones he heard from the respected mouths of national newscasters. It was one of his first ventures into creating the roles that would help define his place in American comedy and political satire.

Stephen always read a lot—not for school, but for what he found fascinating. "I only did what interested me," he remembered. "I just read so much that I would learn incidentally what I needed to pass my courses." He read ancient and medieval history, in which he could focus on the broad sweep of events and think about causes and consequences. He pored over science fiction, played tabletop roleplaying games, and flirted briefly with becoming a marine biologist. That dream died on the operating table. Surgery intended to repair a perforated eardrum left him deaf on the right side, with no hope of a career that would include scuba diving.

When he went off to college he chose a place where he thought he could study philosophy, but his interest in the theater continued to grow, and after two years at Hampden-Sydney College, he transferred to Northwestern University, where he entered their world-renowned theater program. Within a broad liberal arts base, the school offered a three-year course of study in acting that began in the sophomore year. It included work in all the classics from Shakespeare to Shaw, and offered long hours "working on stage crews" to provide hands-on experience. Stephen was determined to finish the program in two years. That meant, as he explained later, that he worked nearly every waking moment and had little time for socializing, but it also meant that he immersed himself in one of the most enjoyable periods of his life. "I have fond memories of Northwestern," he said, "but I made few lasting friends other than my teacher."

At Northwestern, which is located on a sprawling campus hug-

 ging the shore of Lake Michigan just north of Chicago, he met and studied with Ann Woodworth, a wonderful teacher whom I wrote about in my book What the Best College Teachers Do. "Ann became a friend and valued mentor," he remembered. "She was very supportive of me; she believed in my ability." More important, he said, "she encouraged me to be honest with myself about my emotions and that was a difficult thing for me to do, for anybody to do. But she was pretty relentless about it, and for that I'm grateful."

When still an undergraduate at Northwestern, he began working with an improvisational theater in Chicago. "That really opened me up in ways I hadn't expected." In that theater, he learned to accept—even love and embrace—failure. Every person we studied had a similar message. "You must be OK with bombing. You have to love it. That's a great freeing experience," Stephen concluded.

For Colbert, the liberating nature of failure crystallized in the theater. "Improvisation is a great educator when it comes to failing," he noted. "There's no way you are going to get it right every time." But that ability to find comfort in bombing had its roots in what his mother had told him repeatedly, perhaps beginning on that tragic day when he was ten years old. "Momentary disappointments can be seen," as his mother used to say when we had a heartbreaker, 'in the light of eternity. This moment is nothing in the light of eternity,' and that opens you up to the next moment if you don't put too much weight on the moment where you are failing right now."

"If you don't conceive of things that way," he observed while sitting in his office in midtown Manhattan preparing for his nightly television show, "you are stuck only in this moment, and a failure just extends for as long as you conceive of it as important." That doesn't mean, he quickly added, "that you shouldn't learn from it,
but the main thing you should learn is don’t worry too much.” As for life, “You haven’t done it before; how could you possibly get it perfectly right?” Perhaps that attitude helped him see grades not as something that controlled him, but as feedback that he could use.

Stephen had fashioned a philosophy that flowed from his education within the theater, the advice his mother had given him, and the literature he encountered, including the Gospels, and it was that philosophy that freed him to take risks, to explore, to probe deeply, to find self-motivation in what he liked to do, and out of all of that to find an outlet for his creative energies. We found the same general approaches in engineers and journalists, physicians and economists, and a variety of people who learned deeply and worked creatively, who found comfort in the great works of the mind that they produced. Yet for the people we interviewed, the particular ingredients of their worldviews varied, as did the wellspring that gave it life, in each case rooted in individual circumstances.

For Stephen, “don’t worry” became a kind of mantra. “Jesus said, ‘Therefore I tell you, do not worry,’” he quoted. “Who among you by worrying can add a single hour to his life ... Or a single cubit to his height.” Yet his take on that passage from Matthew had filtered through a life filled with learning, with hard work in the theater and the classroom, through his experience and his conviction that he could learn from each episode, each mistake, and each tragedy, even if it meant simply learning to laugh to keep from crying.

In his senior year at Northwestern, he took a course from Lee Roloff, a Jungian psychologist who helped Stephen explore literature from a psychological perspective. “It was a fantastic class, and one that had a deep influence on me,” he remembered. Somewhere along the way, he read Robert Bolt’s play *A Man for All Seasons*, and the essay that the award-winning dramatist had written for the published version of the work. “I must have read that essay a hundred times,” the late-night television star confessed, “and it influenced me profoundly.” Through that essay, he explored what it meant to have some central values that defined you as a person, and the ways in which modern society had stripped many humans of any core essence, turning them into nothing more than consumers of material goods. That quest for values drove much of Colbert’s deep educational intentions, shaping the person he became and the comedy he developed.

You can see such influence in a hundred satirical skits, in his appearance before a congressional committee on behalf of migrant farm workers, and even in the guests he chooses for his late-night television show. When he sat down one evening with Sean Kelly, a Harvard philosophy professor, to discuss the Ivy League scholar’s work on the western classics and the search for meaning in our secular age, the ghosts of that collegiate reading experience reverberated through that conversation.

I heard stories similar to that of Stephen Colbert in interviews with all of the creative people in our study. They sought not just material advancement or fame, but an inner growth, a curiosity about the world that led them to explore the humanities, the arts, and the world of ideas. Frequently this meant they were as much concerned with their own personal development as human beings and the values they held as they were with obtaining knowledge or wealth. All of that became part of their deep approach to learning.

**Avoiding the Devil**

Think for a moment about some other possible outcomes to self-reflection. For some, such a focus on the self might lead to an arrogance that produces little and becomes destructively insensitive. It
can also foster a kind of self-delusion. Many students who win their way into highly prestigious institutions, for example, often think that they are solely responsible for their academic success, an idea that highly influences their sense of justice. They come to believe that they deserve their good fortune and other people don’t. With such haughtiness, they often can’t seem to understand the complex forces that shaped their own lives and those of everyone around them. Sometimes that self-importance can backfire if they ever fall short of their expectations of themselves. They may become depressed, overly anxious, or even suicidal; or they may abuse alcohol, drugs, and other people. Confidence can turn into self-doubt, pity, or a selfishness more reminiscent of a two-year-old. Even if life never turns sour, such people can still lack empathy, compassion, and any sense of justice. People who overcome extreme difficulties like poverty and racial discrimination and rise to great heights of wealth and fame sometimes have the most trouble developing any understanding of other people and the difficulties they face.

Yet those who dwell on the difficulties and disadvantages they face in life can become locked in a life of self-pity and failure, constantly blaming any shortcomings on something else and never taking responsibility for their own education. They can develop a condition that the psychologist Martin Seligman first called “learned helplessness,” in which people who have faced repeated obstacles that prevent them from succeeding still act as if they can’t help themselves even when those obstacles disappear. They might even blame their shortcomings on themselves and sink into a destructive complacency about their alleged inabilities.

As they discovered the power of intrinsic motivation and took control of their own interests, how did the people we interviewed manage to avoid both blind arrogance and a sense of helplessness? The answer to this question is extraordinarily important in understanding their development as creative people. Primarily, they learned to use their past rather than lionize or reject it. Indeed, an important part of that self-examination became a way to recognize how external forces could influence their lives, and then to find ways to turn those factors into something constructive. As a result, they lived in awe of the enormous complexity of life and how all the intricate twists and turns, the social and historical currents, could shape its contours. They acknowledged the need for growth in themselves while appreciating the work of others. That combination fostered a blend of humility and confidence that characterized their accomplishments as creative people.

Dudley Herschbach, the Stanford football player who later won a Nobel Prize in chemistry, perfectly expressed this quiet confidence and humility. “Real science,” he once said, “recognizes that you have an advantage over practically any other human enterprise because what you are after—call it truth or whatever—waits patiently for you while you screw up.” He spoke about the humbling experience of standing before nature and trying again and again to figure it out. “Nature,” he said, “speaks in many tongues and they are all alien. What science is trying to do is decipher one of those dialects.” If scientists make any progress, he concluded, they do so “because nature doesn’t change and we just keep trying. It’s not because we are particularly smart but because we are stubborn.” We saw that same kind of humility and determination repeatedly in the lives of our best students.

A Musical Journey

When she arrived at the Sony Recording Studios on a warm June evening, Tia Fuller found nearly seven hundred people lined up along the street leading into the building. The young saxophonist
from Colorado had already spent nearly eight hours that day rehearsing for her first jazz album, *Healing Space*, but she came to this place like everyone else gathered on those streets in Manhattan to audition for a spot in Beyoncé’s touring band. If she could win a place in the ensemble with the internationally renowned rhythm and blues singer, she would join a whirlwind life of playing before twenty thousand people, night after night. Her own fledgling career in jazz would undoubtedly benefit from that experience. She could learn. As the weather grew increasingly hotter in the days to follow, she would return three times to play for the famous diva and her party, constantly ducking in and out of rooms filled with other women seeking a place in the all-female band.

Tia began her journey to this place and time in a musical family in Aurora, Colorado. Her parents, both educators and musicians, filled their house and yard with the sounds of John Coltrane, Cannonball Adderley, and Charlie Parker. Both her mom and dad sang and played music. “If we were cleaning the house or having a barbecue,” she once recalled, “music was constantly playing.” When she turned three, she started piano lessons, but one day when she was thirteen, sitting in one of the swivel chairs in her childhood kitchen, she announced, “I’m going to play the saxophone.”

Years later, when she saw a videotape of that childhood declaration, it helped mark the beginning of a journey she had not yet consciously joined. In high school, she did play the saxophone, but her life became a scramble of pom-pom squads, marching bands, social whirls, and, oh yes, her classwork. She did well in school, but had no particular passion beyond making good grades. She lacked what she would later call a “crystallized vision” of what she wanted to do and be.

In her senior year, Tia won admission to Spelman College in Atlanta. She chose the liberal arts school rather than a conservatory because she wanted a broad education, yet her initial focus fell on “doing well in school,” with no particular goal or interest. “In my freshman year,” she admitted years later, “I studied primarily for the grades I could get. Nothing more; nothing less.”

Every freshman student at Spelman takes a yearlong course on the African diaspora, the history of African people as they spread around the world, often forced into migration as captured slaves. The course introduces students to historical study, fosters a deeper self-awareness, and helps them work on their writing as they compose more than one small paper each week and receive extensive feedback on their efforts. Tia became increasingly fascinated with this history, but she struggled with her writing. In the end, she received a D in the course.

She felt devastated and defeated, but that experience became an important turning point in her education. Because the course lasted a full year, she still had another semester to go, and the prospect of more bad grades. When she returned to campus for the spring, she went to see the professor and simply asked for help. “She told me I had no organization in my writing and didn’t support my ideas,” she recalled.

At that point, something extraordinary began to happen. Tia seized control of her own education, taking responsibility for her writing and her learning. With the help of friends, she worked diligently, constructing arguments, toying with sentences, twisting them one way and then another. She explored her own thinking, constantly asking herself what she was trying to say, and questioning the reasons behind a particular line of thinking. What am I assuming here? What concepts am I using? What if I move this section here? With each trial, she sought feedback from others in her
dorm. “I was fortunate,” she noted one day while sipping a cup of tea. “I had plenty of friends who cared deeply about their own work, and who were willing to help me.”

In the months and years to come, Tia grew increasingly fascinated with the wide variety of courses she took in science, math, social science, humanities, language, and the arts. In a psychology class, she became intrigued with studies of sleep and the subconscious. In a course on Western music, she learned how to integrate that study with her love of jazz, and how the exploration of any music enhanced her understanding of all of it. She became enthralled with big questions, important concepts, and the connections she could draw. Her dorm room evolved into a kind of constant seminar, with vigorous and lively discussions of a wide range of topics. Tia’s passion and fascination for her courses grew, and when she studied, she brought that enchantment with her. She carried a dictionary, a notebook, and a highlighter everywhere. “When I read,” she remembered one day in West Orange, New Jersey, not far from where Thomas Edison had built his laboratory of innovation a century earlier, “I always took notes and thought about how things connect.”

Rather than cramming, she studied over a long period, giving herself time to think about the topic and ask questions, to associate as widely as possible. “Often I made flashcards of key words and vocabulary,” she reported, “and I would review those items repeatedly, mulling over each word’s implications and applications. ‘I would review something over an extended period until it became a part of me.’ She compared and contrasted, and consciously thought about how something new might challenge some older idea or understanding. She usually studied with friends, and they would discuss ideas over and over, often stopping to quiz each other and bounce ideas back and forth until they were at ease with the vocabulary of a new area. She and her friends wrote outlines of possible essay questions even when they expected a multiple-choice test. For Tia, she wasn’t just preparing for an examination, she was exploring ideas and information. She often studied in different locations. “I could often recall something,” she observed, “because I could remember that I had reviewed it in a certain place.”

Her greatest passion developed around her music, as that childhood ambition about playing the saxophone continued to mature. Before her freshman year started, she visited the campus at Spelman and met Joe Jennings, a jazz musician and educator who became her mentor and “second father.” Under his careful guidance—he offered “lots of nonjudgmental feedback”—Tia began to flower as a musician, becoming consumed with her desire to play well.

In jazz, the music becomes more powerful when it begins to “seep into your subconscious,” she observed, and you build structures that become a permanent part of your reflexes. Tia began to practice six and seven hours a day, and she began to plan. “I set goals for myself, ten years, five years, one year, six months, one month, two weeks, one week, and the next day.” Every night before she went to sleep, she would write in her journal for ten minutes about the plans she had made, mapping the next day with precision. “I usually get up at 7 am and went to the Shoot and Run to work out. Then shower, get dressed, and off to class.” Between classes she would practice and study. “I tried to live a balanced life,” she noted some years later. “I had time to practice, go to class, to the library, and relax with friends, but I planned that out each night before I went to bed.” She also planned time for meals, usually ate three times a day,
avoided red meat, and always included something green. “Exercise, practicing, studying, meeting with friends, all became a way of life for me.”

If she had a large project, she would first “envision herself” finishing it. “I would keep focused on the light at the end of the tunnel,” she explained, “and what that accomplishment would mean. That would help me develop a crystallized vision.” Once she had developed that vision, she would use all the resources at her disposal to achieve it. In college, she began networking, making connections that would help her learn and grow. She joined professional organizations like the International Association of Jazz Educators and collected business cards. On Friday nights after six, she went out to the local jazz clubs, always taking her horn in case of any opportunity to engage in an impromptu session. During the week, late at night, she sometimes slipped away to a jam session somewhere.

In her second year she joined a social organization that emphasized humanity, nurturing, forgiveness, wisdom, and spirituality. “Everyone thought of it as a sorority,” she remembered, “but it was really more than that.” Anchored in religion, “but not necessarily in Christianity,” the group practiced “weekly rituals,” including one in which women spoke to no one except to discuss coursework with their professors or another student. Tia found considerable comfort in such practices, and in her own daily reading of biblical scriptures.

Yet her success in college, the deep learning that she achieved, came primarily from her passion, her ability to approach life with curiosity, and her intrinsic motivation. She began with a vision, took control of her own education, found who she wanted to become, and cultivated the habits that would sustain her. “They had to become part of a lifestyle,” she concluded.

When she graduated magna cum laude from Spelman College, Tia didn’t plan additional schooling, but the University of Colorado gave her a “free ride” to pursue a master’s degree in jazz education. After finishing that degree, she moved to New York City.

On the Friday before Father’s Day, Tia had been recording her first album all day long when she got a call from Beyoncé’s staff, asking her to return for one more audition. On Sunday, she learned she had gotten the job. In the months and years to come, Tia treated the experience of playing with Beyoncé as she did everything else in her life: it simply expanded her education. “I’ve tried to take that experience” of watching her work, she once told a reporter, and learn “how to function as a bandleader.”

Sometimes that curiosity so essential to intrinsic motivation, deep learning, and adaptive expertise appears early in life and never goes away. For others it comes and goes, and sometimes comes again. Can you rekindle it? I saw my niece recently. “What are you doing with yourself?” I asked.

“I teach astronomy,” she reported with a smile.
cluded, became “essential for scholarly work” and for “meaningful participation in a democratic society.”

No one explanation can capture why our subjects developed such broad interests and pursued vigorously that liberal education for the free person. Ability and success alone cannot explain the choices they made. Although curiosity played a central role, so did a sense of purpose, a devotion to some greater cause, and a concern for a just society. They loved beauty in all its forms, often learned as children the power of stories and the excitement of solving puzzles, and they used their college experience to engage and stimulate their minds. They understood education as a developmental process in which they sought to grow the power of their minds, and that too influenced the kind of learning they attempted.

Some pursued that broad and integrated study earlier and more vigorously than did others, and those in our group who pursued it most consistently and extensively exhibited the most impressive accomplishments. Furthermore, while our best students developed broad interests and the capacity to integrate abilities and insights from a wide variety of domains, they ultimately chose a stage upon which to play out their lives and careers. For some, that venue changed from time to time, and for most, it combined activities in unusual ways, but they knew when to focus, to perfect their talents. The decision to specialize didn’t mean turning off all those other interests. Rather it meant using everything they had learned to create in one or two primary areas. Most important, they didn’t define themselves in terms of the profession they pursued, the contraption they invented, or the song they sang, but instead as creative, curious, compassionate, concerned, and caring human beings, citizens of the world.

8

MAKING THE HARD CHOICES

J o Rowling, the woman who created Harry Potter, recently stood before a Harvard graduating class and told them a story from her own life. When she went off to the university to study, she said, her “parents, both of whom came from impoverished backgrounds and neither of whom had been to college,” hoped that she would study something “useful,” a subject that would earn her a living and keep her out of poverty. They wanted her to pursue “a vocational degree,” she explained. “I wanted to study English Literature.”

Perhaps after some family bickering, she reached a compromise with them and went to school “to study Modern Language.” But that didn’t stick. “Hardly had my parents’ car rounded the corner at the end of the road than I ditched German and scuttled off down the Classics corridor,” she told the graduating seniors.

“I cannot remember telling my parents that I was studying Classics,” the author confessed. “They might well have found out for the first time on graduation day. Of all the subjects on this planet, I think they would have been hard put to name one less useful than Greek mythology when it came to securing the keys to an executive bathroom.” At the time, Rowling, whose writings eventually made her one of the wealthiest people in the world, simply followed her own passion. Yet that turn down the classics corridor had momu-
mental consequences for her and for millions of her readers and moviegoers.¹

None of us can, of course, plan to be Jo Rowling and write best-sellers that rival her Harry Potter series, yet a choice of one’s major field of study in college plays a huge role in the life of every college student. I can’t say that I found many distinct patterns among our subjects. Mary Ann Hopkins was a bit like Rowling, picking Latin on her way to medical school simply because she found it beautiful. Debra Goldson chose social psychology, both because she found it interesting and because she thought it would help her to be a better physician. In both these cases, and in general, our subjects chose their field of study with a purpose, for the sake of beauty, intrigue, fascination, practicality, or whatever.

Picking a major is one in a series of decisions that students make that can have an enormous influence on their academic successes, their growth as human beings, and their lives as creative and productive individuals after college. The trouble is, most of us often don’t think much about the choices that really matter.

Which decisions make the biggest difference? If we are to understand what our best college students did that helped them become highly creative and productive people in later life, we must identify those key choices—not so much to see which way they turned, although that can be helpful too, but to see what questions mattered most.

Thus far, I’ve written little about grades, and virtually nothing about how to make good ones. But I said back in Chapter 1 that, although the general thrust of this book is decidedly not just to help students make the honor roll, eventually I would offer some advice on that quest too. You can, I argued, take a deep approach to your studies and still obtain those high marks. I’d still contend that if getting on the dean’s list is a student’s primary concern, she or he is less likely to achieve either a deep approach or a creative life. This chapter is the closest I will come to providing that conventional guide to high marks and “academic success.” To compose it, I’ve used both the practices of the amazing people I interviewed and the vast and growing body of research literature on everything from study habits to time management.

This chapter is not, however, some magic book of answers you can follow like a recipe—as if you were baking a cake rather than fashioning a life. It requires deep thought and crucial judgments about a variety of messy problems. It offers food for thought as well as practical procedures you can apply immediately.

Underlying each of the questions we are about to explore lie three key points: First, travel through these areas requires students to change paths from time to time, or even to backtrack and follow a different road when needed. Second, it demands that people accept and even embrace failure, and realize how much they can benefit from falling short. Jo Rowling said it recently: “Failure taught me things about myself that I could have learned no other way.” Third, and perhaps most important, students must find a purpose for their education, take control of the process, and believe that they can constantly expand their abilities and achieve.

What Keeps You Working?

Some years ago, Walter Mischel, a psychologist at Stanford University at the time, concocted a now-famous experiment in which he promised four-year-olds a marshmallow immediately or two of the fluffy treats when he returned from an errand. If they wanted to eat one of the white balls right now, all they had to do was ring a bell, but they would get only one rather than the two they would receive if they waited. He then left the room, leaving them with a plate
full of tempting goodies, including the marshmallows, cookies, and pretzel sticks. Some of the children couldn’t resist the temptation, and once all the adults left the room they either gorged themselves on the treats or rang the bell instantly. Others, however, resisted, and held out for the greater rewards to come.

In the years following that experiment, Walter and his colleagues started keeping track of the children and their progress through life. Some astounding conclusions emerged from the data they collected. Children who could wait the longest generally grew up to become productive and successful students and adults while those who opted for immediate rather than delayed gratification often had behavioral problems in school, did less well academically, had trouble keeping their friends, and on average compiled SAT scores that were two hundred and ten points lower than those who could wait.

Was there something special about those who could delay gratification, or did they learn some secret technique to keep them from caving in to temptation? Over the last twenty-five years, psychologists have found that children who can resist best find ways to distract themselves from thinking about the marshmallows. They want the treat as much as the others do, but they learn to concentrate on something else rather than focusing on the goodies. Furthermore, the social scientists have discovered that if they can teach kids some mental tricks to turn the enticement into something else in their minds, such as pretending it is just a picture of the tempting treat rather than the real McCoy, they could greatly increase the amount of time the youngsters could wait. “Once you realize,” Walter Mischel observed recently, “that will power is just a matter of learning how to control your attention and thoughts, you can really begin to increase it.”

For our best students, learning to put aside tempting distractions became part of their plan for getting themselves to work. Their approach frequently paralleled that of Walter’s kids who could best delay their gratification. In major part, they decided that they had a purpose for their education and that they were in charge. With that purpose and personal control firmly in mind, they learned to distract themselves toward their studies and away from the party they might attend, the website they could visit, the telephone call they could make, the computer game they could play, or any other enticing diversion. They became so engrossed in their work that they didn’t have time to think about what else they might do. But that determination often came also from a mixture of moral commitment, empathy, and compassion, and the role their work might play in that dedication to some higher purpose. Often that meant finding the importance of the overall goal, then zooming in on the details of the task at hand to get started.

Some people told me they had to think about each step in, say, writing a paper, from picking a question to walking to the library. Many of them set deadlines for themselves and held themselves accountable, letting those self-imposed limits distract them from the marshmallows in their lives. They also had to believe that they could do something. Whether it was Stephen Colbert finishing a three-year theater program in two, or Neil deGrasse Tyson understanding the heavens, they often kept themselves on task by thinking about the broader rewards of their quest. They let the joys of their own passion for something plus a higher moral commitment drive them through even the most distracting circumstances.

Yet I cannot contend that any one technique worked for everyone. Instead, there is a larger point about their approach that deserves the lion’s share of our attention. Their secret came in dedi
themselves to the development of the dynamic power of their own minds and the use of that mind to create a better world, and then exploring what worked, ultimately not depending on anyone else’s prescriptions. Instead, they were constantly open to any good approach they encountered in others. Some people, like Tia Fuller, Neil deGrasse Tyson, Dudley Herschbach, and others, did make out a schedule and followed it religiously. Others didn’t. Yet they all did what worked for them, sometimes borrowing ideas they learned from others, but never assuming that self-control and delayed gratification came in only one size.

In one of Paul Baker’s exercises that Sherry Kafka and others encountered, students thought about some creative work they had done in the past, whether it was baking a pie, writing a story, creating an outfit, solving a math problem, or whatever. They would then examine what it took for them to do that work. What attitudes did they have? Did they control their actions or respond to someone’s command? What rituals did they perform, such as making out a schedule or eating ice cream? What did they tell themselves? What did they visualize? Where did they work, for how long, and at what time of day? What did they value? Did they connect the job to some larger purpose? Did they keep constantly in mind the feeling they would have once they had finished, did they focus on each step along the way, or both? How did they feel when they finished the work? Did they enjoy the task, or simply value the results? They had to talk to themselves and to understand their own minds and how they worked, and it was that personal examination that led to the particular practices that drove their labors rather than some tight prescription of activities and procedures.

In recent years, several researchers have looked at the other side of this coin, exploring what causes people to put off tackling a job when they know and believe that they will be better off for finishing it. People in general, and college students in particular, are notorious procrastinators. While that research has explored various aspects of why people delay doing some jobs and what they can do about it, one dominant theme emerges. As Timothy Pychyl, director of the Procrastination Research Group at Carleton University, said, “Procrastination is about not having projects in your life that really reflect your goals.” Our subjects found ways to avoid procrastination because they had strong intrinsic motivations and projects that fully reflected their goals.

Common wisdom holds that to break the grip of procrastination we must condemn it in ourselves, rebuking the habit like a stern taskmaster. Yet the studies that Timothy and others have conducted echo and complement a theme we have already explored: forgive yourself. He found that undergraduate psychology students who forgave themselves for putting off their studies on the first examination were less likely to procrastinate on the second exam than were those who beat themselves up over their earlier misdeeds. That kind of forgiveness, however, is not the same as approval. As Kristin Neff has suggested in her concept of self-compassion, forgiveness implies confronting bad behavior, understanding that humans tend to procrastinate, and mindfully searching for ways to overcome it without condemning yourself as a bad person. We found that our best students followed a similar pattern in their thinking. They didn’t judge earlier performances but instead focused on what they needed to do to improve.6

What Teachers Should You Choose?

Certain websites can tell you how “hot” or “easy” a professor is, but they offer little insight into whether an instructor fosters deep approaches and achievements in learning. For an earlier book, I stud-
ied professors with enormous success in fostering deep learning. To no one’s surprise, these master teachers clearly knew their subjects extremely well, and could think deeply about them. But how does a student measure an instructor’s knowledge and thinking ability? It is difficult at best. One good way is to look at how the professor assesses students’ work. If they use tests that merely require you to memorize information and spit it back, steer clear. That may suggest that the teacher’s knowledge and understanding doesn’t run deep. Look for people who expect students to develop an understanding and use it to analyze and solve important problems. Based on my studies, the following factors seem to be most important in determining whether the class will provide a good learning experience, assuming that the professor does know her stuff.

1. Is the course built around clearly identifiable questions to be pursued or abilities to be mastered, and does it help students see the importance, beauty, and intrigue of those questions and abilities? Repeatedly, our subjects told us about life-changing courses that had a central question. What is justice? What causes wars? What does it mean to write more effectively and how can I learn to do it? Who has power and how is it exercised? Does evolutionary theory explain why we have different kinds of animals and plants? How do you calculate the area under the curve?

2. Does the course allow students multiple opportunities to engage in those higher order activities in pursuit of those questions or abilities, receive feedback, and then try again before anyone “grades” their work? Or does everything ride on one or two high stakes tests or papers where there is no chance to revise and improve what they have done? In their own intellectual work, professors constantly seek feedback from colleagues, revise their work, and seek more responses before submitting a paper to a journal, for example. As they do so, none of their colleagues are likely to say, “you’re making a C thus far.” Instead, they offer substantive comments on how a paper or a line of thinking can be improved long before anyone makes some final judgment about their work. Yet those same people sometimes build courses that fail to offer those opportunities to their students. They teach then test, and the score from each exam lies frozen in the grade book, a permanent record from a single experience. Grades in that type of class reflect various points students have reached in their learning over the semester rather than what they have achieved by the end of the term. There is no sense that the marks might reflect the abilities the students had acquired by the end of the course.

When Derek Bok, the president at Harvard at the time, asked Professor Richard Light to identify those experiences that students found most intellectually satisfying, Light and his colleagues interviewed current and former students. When he published his initial results, the professor reported that those most pleasing courses set high but meaningful standards, goals that were important to students long after the class was over, but they also, as Light once told me, “gave students plenty of opportunity to try, come up short, and try again before anyone put a final grade on their effort.”

3. Do students have the opportunity to collaborate with other learners struggling with the same problems, questions, and abilities? Does the instruction foster that collaboration?

4. Does the class encourage speculation, and an opportunity to exercise new skills even before students are well-versed in the discipline? People learn by doing, yet some courses insist that students must simply memorize myriad facts before they can plunge into doing any substantial intellectual, physical, or emotional work. Other
courses will get students involved even before the students know much, helping them to learn as they practice in a nonthreatening but stimulating atmosphere. Those latter classes are like the way most people learn to play the piano. They don’t memorize keyboard strokes for months before putting their fingers on the ivories. Aristotle said it best long ago, “For the things we must learn to do before we can do them, we learn by doing them.”

5. Does the course challenge existing ways of thinking and seeing the world? People build mental models of the world and then tend to use those paradigms to understand everything they encounter. One of the great traditions of a liberal arts education is that it ideally helps students realize the problems they face in believing whatever they may accept, putting them in situations in which their existing models do not work. Other courses will never challenge anything, and still others will simply expect students to accept a different dogma without questions or reasoning.

6. Does the course expect students to grapple with important questions, mount their own arguments, exchange ideas, accept challenges, and defend their conclusions with evidence and reason?

7. Does the course and professor provide the kind of support that students need as they struggle with important, intriguing, and beautiful questions? This support may take many forms: intellectual, physical, and sometimes even emotional.

8. Do students come to care about the inquiries, the promises and invitations of the course, and about whether their existing paradigms feel challenged and do not work?

9. Do students in the class generally feel in control of their own education, or manipulated by requirements?

10. Do they believe that their work will be considered fairly and hon-
What Do You Do When You're Bored?

Some people told me that they never had any highly stimulating teachers, yet they managed to learn deeply and to emerge as adaptive and creative people. They remained active learners, no matter what the instructor did. They formulated big questions, even if the professor didn’t. In the midst of a mind-numbing lecture, the active learners speculated about possibilities, applications, and implications. “I always found something of interest,” became a common refrain from our subjects. Most important, they explored actively outside of class, reading and thinking, searching and contemplating. “With the Internet, the possibilities are almost endless,” one person said. They took control of their own education and remained ultimately responsible for its content and quality.

How Will You Read?

When you pick up a book or article and run your eyes over words on a page, what happens in your mind? What’s going on as you read these pages? “To tell someone to read a book,” says David Dunbar, a teacher in the CITYterm program at the Masters School, “is like rolling our soccer balls and asking someone who doesn’t know anything about the rules or strategies to go play the game.” Reading can take many forms, and how it is done makes a huge difference. We discovered that our students who emerge as highly creative and critically thinking individuals often employ a series of approaches to their reading.

1. They read with deep intentions. Before opening the book, they have questions in mind: What’s this all about? What’s the point? How does this relate to other subjects? How does this challenge me? They intend to find meaning in the text and to apply it to some problem. Like a detective in search of clues in a murder mystery, they begin scouring the text with questions that lead to more inquiries. They realize that the little lines that we call letters and words are mere symbols, standing for some reality outside the page: an idea, an event, a concept, or something of the sort. They go looking for that meaning that lies behind the page, treating the printed word as a window through which they can see something else.

2. Before beginning the reading, they speculate on what they expect to find, confirming and dismissing those predictions as they go. Good readers invent the book they think they are about to encounter. They imagine questions and possible solutions, and then measure those guesses against what they eventually find on the printed page. Such a practice helps them to make sense of the reading, but it also serves another important purpose. A growing body of evidence strongly suggests that speculating and predicting before finding the “correct answer” helps people become adaptive experts, better able to conquer unusual problems. They enjoy taking on the unknown, those cases where the routine procedures don’t work. If they have experience in speculating before they “learn,” they will likely appreciate how an easy solution that seems so obvious can prove to be so inadequate when compared to what some expert has devised. The next time around, they will be wiser for it, looking for holes in their own thinking. As John Bransford, a learning scientist, put it, “adapting to new situations often involves ‘letting go’ of previously held ideas and behaviors,” and he and others have discovered that people are most likely to reach that point if they have first specu-
lated about possible solutions before they read what an authority has to say.

3. They examine a book (especially a nonfiction one) or article before they read it, looking through its table of contents for clues about purpose and structure, reading any summary sections first, skimming through headings, and noticing the kinds of evidence and grand conclusions offered. Is it organized inductively or deductively? When was it published? What do I know about the author? Why did she write it? What major questions is he trying to answer?

“I often spend thirty to sixty minutes raising questions about a book before reading it,” one person told us. Does it have tables and charts? What can they tell you? Is it part of a series? If so, what’s the purpose of that series, and how does this book fit into the broader scheme? What do I want to get out of this work? What questions am I trying to answer? Does the book address them directly, or focus on some important tangent of my primary concern? Do I understand the abstract of a scholarly paper before plunging into the body of it? Should I read the discussion before plodding through the experiment?

4. Our best students make connections as they read, relate to bigger questions, pause to contemplate and integrate. They write notes in the margins or jot down ideas and reactions in a notebook. Sometimes they struggle with what questions they want to ask, but those struggles become part of the reading process.

Making connections, especially in science, math, and engineering disciplines, often means visualizing concepts, grappling with ideas, thinking about their implications and applications, asking about evidence in an argument or experiment, looking at procedures but thinking constantly about ideas that lie behind those steps, and applying that emerging understanding to some larger problem.

5. With fictional literature, they connect in a variety of ways. What are the great philosophical questions that this novel or short story raises, if any? How does it help me confront my life and the world in which I live, or the one that I would like to create? They can look at a poem for its beauty and rhythm, but they can also explore any literature as a reflection of a culture or a time and place. They can contemplate its challenge to values and perspectives, or analyze its symbols and metaphors and how they invoke certain thoughts and emotions. Is this the story of a quest? A microcosm of a broader world? Is it like a zoo or museum rather than a journey? How is language used to create certain emotions? Why do I cry or laugh? Or laugh to keep from crying? Does the book help me be more empathetic and compassionate? Does it help me join a different community, and to understand the values and perspectives of the writer?

How does it treat space and time, rhythm and movement, silhouette and sound? How do those treatments compare with the way the study of physics, for example, might approach the same subjects, or how my culture approaches them? Does it help me see issues of justice and morality differently? How does it do that? What is unique about the way I will approach this play or novel? Given my background and origins, the soil and people and homes that produced me, why do I respond as I do to the literary conventions that this work employs? When I read an opening line of a great novel like One Hundred Years of Solitude, why do certain words conjure up such strong images, mystery, and intrigue: “Many years later, as he faced the firing squad, Colonel Aureliano Buendía was to remember that distant afternoon when his father took him to discover ice.”

6. In nonfiction, making connections often means looking first for arguments in the text, recognizing that not every statement rests within an argument but that every argument contains both a con-
clusion and premises offered in support of that conclusion. Sometimes that means recognizing that some conclusions are implied rather than stated, and so are some premises.

When students actively take apart an argument, they can begin to ask questions about those parts. Do the premises support the conclusion (or, as we often say, "does this make sense?")? What alternative ideas can I draw from the same information? What is missing? If I accept the premises, must I accept the conclusion? Or does the evidence make it highly probable? What major concepts does this argument employ, and what assumptions does it make? How is this related to something I've looked at in other classes, and in life?

7. They evaluate the quality and the nature of the evidence. If the evidence comes from inference, does it makes sense to ask from what it is derived? Are there other possible ways to look at the same evidence? If it came from an observation, does it help to find out who did the observing and from what perspective?

8. As active learners, they recognize the kinds of agreements and disagreements that exist between this text and other items they have read and with their own notions. Two people can have different attitudes while entertaining the same beliefs. Or they can believe something different and either agree or disagree in attitude. In historical studies, for example, two scholars can both agree on what caused the United States to become involved in the Second World War but disagree on whether the country should have done so. If the disagreement is strictly about values, no appeals to evidence will likely make a difference. If they are about beliefs, then evidence becomes important. Sometimes conflicting attitudes flow from differences in belief, but not always. As students contemplate these possibilities, their minds become sharper and more systematic.

9. Many of our subjects outline when they read, and later reduce that initial summary, taking notes on notes on notes. With each step in that reduction, they can begin to judge evidence and conclusions, to poke at the testimonies and generalizations, to notice what concepts are employed, what assumptions have been made, and to think about their implications and applications. Many people keep a dictionary at their side, looking up unfamiliar words, or, better yet, speculate about their possible meaning, deriving definitions from the context, then testing those suppositions once they are able to check the reference book.

10. Our best students engage in all cognitive activities at the same time. They remember, understand, apply, analyze, synthesize, and evaluate as they read. Many college professors, however, organize their courses as if that list of mental activities has to be conquered in order rather than in an integrated fashion. They insist that students memorize large bodies of information before thinking about the data. But the human brain doesn't work that way. If I asked you, for example, to "learn" the following numbers (that is, remember them), you might find it impossible to do: 1, 4, 9, 6, 25, 36, 49, 64, 81. But if you first realize that they are merely the square of the numbers one through nine (1 × 1 is 1; 2 × 2 is 4; 3 × 3 is 9, 4 × 4 is 16, etc.), they are easy to recite. You must understand before you can remember. If you have applied that comprehension to some consequential problem, it is that much deeper and more meaningful. You can improve your ability to apply it if you have taken ideas and information apart and looked at their elements and the relationships among them. You can enhance that capacity to analyze if you have tried to put things back together in new ways. If you have evaluated something with the ideas and information involved, it all becomes more meaningful. (Recall Mary Ann Hopkins and her father, taking apart the family car in the garage. The process is the same, whether it is with
cians or arguments.) When Benjamin Bloom and his colleagues came up with their famous list of activities in which the human brain could engage (recall, understand, apply, analyze, synthesize, and evaluate), there was nothing in that taxonomy that said it had to be conquered in order. Yet many teachers will organize learning as if it does.

11. They read as if they plan to teach. John Bargh and his colleagues discovered long ago that if students merely study as if they are planning to teach, they will remember and understand more. In a now classic experiment, he asked one group of students to study some verbal material for themselves. He instructed others to prepare to teach it to someone else. The second group retained far more, even if they never actually taught anyone.9 Our best students went far beyond that principle, applying it not just to the memorization of words in a list but to the understanding of ideas, their applications and implications.

At Saint Olaf College in Minnesota, students in large introductory psychology classes discovered the benefits of preparing to teach elementary students some topic from their college class. “Challenging yourself to teach a fairly complex scientific concept to elementary students,” one Saint Olaf undergraduate reported, “forces you . . . to understand the concept inside and out, and . . . to be creative in designing ways to teach.”10 It produces elaborative approaches to studying that connect and integrate.

At the University of Virginia, students in Andrew Kaufman’s Russian literature class don’t just read and discuss War and Peace; they take Tolstoy behind bars, preparing seminars for inmates of a juvenile detention facility. The undergraduates go into the Beaumont Juvenile Correction Center, an hour east of the university campus, and help young boys jailed for a variety of offenses. They read Russian literature to grapple with three fundamental questions: Who am I? Why am I here? How should I live? “This class is applied literature,” one student concluded. “You’re applying it to your life.” To get into the course, students must first petition the instructor for admission, taking charge of their own education and joining what Parker Palmer and Andrew Kaufman call a “community of truth,” a place where people explore questions and ideas rather than just receive facts. As they battle with some of the deepest questions of our existence and prepare to stimulate that same struggle within young incarcerated males, they learn in ways that profoundly influence how they will subsequently think, act, and feel. As a result, they build deep relationships with the material, one another, and the young people they encounter at Beaumont. “It seemed like everyone was there listening to each other,” one student reported. “It goes back to that common ground. We all wanted to be here,” another volunteered. “For once, I was actually able to take literature and apply it to a situation. I had almost forgotten that was possible,” admitted a third student. “It was very rare to find people commenting just to hear themselves talk,” one person observed. “In other classes my main motivation is graduation. Motivation in this class was not to let these guys down. I had to be here to make sure they understand.”

These Russian literature students lost sight of the grade and experienced, many for the first time, a focus on understanding deeply. As they prepared not just to explain something to someone else but to stimulate in that person a deep consideration of some important idea, the undergraduates in this class developed their own profound comprehension and appreciation. Few students get an opportunity to teach, and even when they do, it often centers on preparing a presentation rather than fostering a conversation. Yet we heard from
people who certainly understood the value of elaborating on their own learning, preparing as if they planned to help someone else learn and exploring the rich variety of ways that they might confront a body of material.

Much the same full-bodied investigation and elaboration takes place in “reading” a lecture. The best students will associate and integrate, interrogate and examine. One trick students use is to take two sets of notes. One records important information and ideas. The other jots down questions, reminders, speculations, implications, applications, and possibilities. Some students will draw a line down the middle of a page, with space on the left for all those inquiries. On the right, they record any information, procedures, concepts, or ideas. And they learn to process and elaborate as they hear something new rather than simply becoming a stenographer trying to “get everything down.” Some people take notes in class and then make notes on their notes as soon as possible. “I would buy these ‘second sheets,’ really cheap yellow paper, and take notes on that in class, and then later make more permanent notes in a spiral notebook,” one person reported.

We didn’t investigate Isidor Rabi, a Nobel Laureate in physics, but he supposedly once attributed his habit of elaborated learning to his mother. “My mother made me a scientist without ever intending it,” he said. While other parents in Brooklyn, where he grew up, asked their children what they learned in school, his mom had a different inquiry every day. “Izzy, she would say, ‘did you ask a good question today?’ That difference—asking good questions—made me become a scientist!”

Only in this context can we understand something that several of the people I interviewed told me. “I didn’t really study that much,” they said, “although I read a lot.” That obviously doesn’t mean they never cracked a book. In fact, they spent long hours in the library reading or in the laboratory doing experiments. It means that they didn’t depend on last-minute cram sessions or rote review of material, but rather that they constantly elaborated, questioned, explored. They took ideas and arguments apart as they read them. What about this idea or information speaks to me? Is it the line, rhythm, sound, space, or shape? How does it influence my values? Does this make sense? Why? How is it related to something we discussed in another class or some consequential problem? As they read and questioned, probed and contemplated, speculated and evaluated, our best students came to understand and apply, and as they did, they remembered.

How Will You Study?

Yet there comes a time when students must review material, and how that process unfolds makes an enormous difference. On cold winter days at the University of Minnesota, snow often covers the campus. When spring begins to melt the frozen white blanket, crocuses bloom all across the fading ice, adding little dots of color here and there. Even before green leaves spring from the dormant branches of trees and bushes, the first breath of nonfreezing temperatures prompts students to don their summer garb, perhaps hoping that if they dress for the occasion, they may hasten the arrival of balmy weather. Into this environment in the late 1960s came James Jenkins and Thomas Hyde, and an experiment that would help spark a revolution in thinking about how best to study.

The two psychologists created several groups of students and gave them a list of words to study. They asked some students to notice
on deep learning. What does the research tell us about how best to review material?

*Elaborate, elaborate, elaborate.* Associate, associate, associate. Make connections. Ask questions. Evaluate. Play with words in your own mind. Have fun. As Jenkins and Hyde demonstrated, even the somewhat silly notion of rating a word on its “pleasantness” will help. When I introduced their ideas, I set them in the context of snow and winter in Minnesota, greatly increasing the chances that you will remember where they did their original research and even what they concluded. You can think about the rhythm a word conveys, the lines and colors of its meaning. The more associations you make, the greater your chances of recalling it later.

*Develop an understanding before trying to remember.* Recall the number example I mentioned earlier (14916, etc.)? This same principle applies to practically anything you might try to stuff away in the memory banks. Understanding requires a deep network of associations, and it is those intricate strands of connection that make recalling even possible. I’m currently trying to learn Chinese characters used in writing Mandarin. At first, the task seemed almost impossible, and every guidebook I consulted advised blind memory, repeating them over and over again. Yet I began to make progress only when I started taking them apart, noticing that they often consist of several characters, each with its own meaning. I set about making up stories with them, and learning other tales that native speakers and readers have passed down for generations. The character that means the same thing that the English word “cry” conveys now looks to me like a stick figure of a person with two large eyes, a single tear dripping from the corner of the left one. The character for “forest” consists of three smaller stick drawings of a tree. The one for “good” contains the characters for woman and child.
Repeat, repeat, repeat. No matter how much I try to associate, I can remember some characters only after repeated exposure. But how often should I repeat them? Does it pay to repeat endlessly the night before the big examination, or to stretch the same number of repetitions over days and weeks, perhaps spending less total time? Diligent students will often spend hours trying to memorize dates and names, parts of the cell, or other details. Recent research has discovered, however, that some of that traditional process can be a waste of time.

Consider how the brain works. When you encounter something new—let's say a new word—you will begin to forget it almost immediately, and a day later you might not recall it at all. But a second exposure will extend the time you can remember it. And so will a third, a fourth, and so on. Each time you hear it, you can wait a little bit longer before encountering it again and still not forget it. If that next exposure catches your brain just before the word falls out of mind, you can restore its freshness. But what is the ideal space between exposures, both for immediate recall on an examination and for how it will influence the way you will subsequently think, act, and feel?

Although research offers no definitive answers to this question, it seems clear that the empirical studies reinforce the patterns I saw among the people I interviewed. In general, they spaced their repetitions and, most important, studied them in the context of making connections with other things. Several people have tried to work out exactly how long you can go before you need another injection, with the general notion that each time you encounter something, you can go longer and longer before the next exposure. Some popular language learning programs, like Pimsleur, are based in part on this principle. Each time you hear a new word, you will meet it again within a few seconds, but the third instance might be a minute later, the fourth, several minutes on, and the ninth time could be the next day. Computer-assisted flashcards, like SuperMemo and Anki, have even tried to work out algorithms for exactly how long those intervals should be, and some people argue that any more frequent exposure simply wastes time. Although some empirical researchers doubt the evidence, millions of language learners have found great success using carefully spaced repetition techniques. These programs have become increasingly popular among students in translation schools in Europe and second-language learners in China.

All of that suggests that you will benefit most from spacing study over several weeks rather than just massing it right before a big test, although a last-minute brush-up after weeks of study could help ensure more accuracy on the examination. Furthermore, that is exactly the pattern that I noticed among our subjects. They read and reviewed constantly, taking notes on their notes and immersing themselves in the material as they went. Dudley Herschbach and others made outlines upon outlines. Tia Fuller began preparing essays, writing out her thoughts repeatedly, using new language and ideas frequently until they became a part of her.

Can you spend too much time reviewing? Probably, especially if all of that time comes massed right before an exam. If you space it out properly over many weeks, you can most likely spend less total time and achieve more then you would in an all-night cram session. Computer programs can help focus your attention on the hard-to-remember items, giving less but still enough time to the items you remember easily.

Yet repetition will pay its greatest rewards if done in the midst of meaningful and elaborated work. Thus, I remember more from my language tapes, in which I'm engaged in conversations that seem
WHAT THE BEST COLLEGE STUDENTS DO

authentic, than I do from flipping through flashcards, even though
the latter sometimes help polish my skills. I recall characters that I
see frequently in interesting passages that I read, rather than those I
meet only on the backside of my study cards.

Testing is better than rehearsing. A growing body of evidence strongly
suggests that if I test myself on that vocabulary, even when I get it
wrong, I will learn more than I will simply going over and over the
same material. Something happens in the brain when we force it to
dig something out of its deepest barrels. The act of searching, trying
to recall, and piecing together something builds strong and stable
connections that just never emerge from repeating the item again
and again. That may be one of the reasons that explaining a concept
to someone else helps you to remember what you understand. In
that environment, you test your ability to recall. When I listen to my
language tapes, I benefit most if I stop the player and try to remem-
ber a phrase rather than waiting for the narrator to give me the an-
swer. Humans construct their memories each time they bring them
to mind, and those repeated constructions when I test myself make
it easier to rebuild them the next time. We heard stories from stu-
dents who had studied together, quizzing and probing one another,
each person taking a turn at teaching the others.

Suppose you begin by just guessing and getting everything wrong.
Will that help as much as trying to recall correct answers? Shouldn’t
you at least study first before attempting to remember something?
If you just guess wildly before somebody tells you the right answer,
you’ll undoubtedly get it wrong, and won’t that practice of incor-
correct information diminish your learning? Quite the contrary, argues
some recent research. In experiments at the University of California
at Los Angeles, psychologists gave students two different ways to
learn some material. Half of them had to guess at a response first
before seeing the correct one. The others studied first. So who did
better on a subsequent examination? Those who had first generated
possible answers, even though they were all wrong, scored signifi-
antly higher than the students who had spent their time reviewing
the material first. In another experiment, the researchers gave stu-
dents a scientific article on vision. Half the subjects just read the
article, then faced a test on how much of it they remembered. The
others took a test before reading. Later, they took another exam to
see how much they could recall. Even though those who read first
had copies of the article that highlighted and italicized all of the
material that would be on the exam, and those who speculated first
didn’t, the speculators did significantly better on the final exam. 15

Do you always study in the same spot? Don’t. If you study in different
places, that helps create variety, and that rich experience can rein-
force what you are learning. When Tia Fuller and others told us they
did school work in different places rather than in some favorite
nook, that habit reflected the research on learning. Numerous
experiments have found that if learners simply study in at least two
different places, they are more likely to recall the material. In one
of the first such trials, two different groups studied a list of words.
Some students returned to the same room twice while their coun-
terparts spent the same amount of time divided between two loca-
tions. When asked to recall as many words on the list as possible,
those who had moved around did far better. Variety creates rich as-
association, even when those connections form in the background,
totally outside of what we are consciously thinking. 16

Don’t multitask, but do study more than one subject at a time. That
probably sounds like contradictory gibberish, but it’s not. Watching
television while reading history or playing a computer game while
trying to write a paper keeps you from concentrating. Numerous
experiments have found that with the exception of a very few routine tasks that we’ve done repeatedly over many years, the human brain can’t really perform two different tasks simultaneously. Thus, we can walk and talk at the same time, but we can’t really read a book and watch television simultaneously. Instead, we will, at best, switch constantly between the two, taking twice as long to finish the book and getting less out of it.  

Try this experiment. First, write each of the letters from A to Z. Then do the same for the numbers 1 to 26. Next, write the letters and numbers alternately: 1, A, 2, B, and so forth. If you timed both trials, you’d find that alternating between the two tasks takes far longer then doing the numbers and then the letters. Multitasking doesn’t work.

But we also have evidence that students remember far better and understand more deeply when they constantly integrate subjects together, even ones as different as chemistry and history. Thus, studying two or more subjects almost simultaneously can help create that integration. That might mean alternating between the two in ways that constantly look for connections, and finding ways to think about one in the context of the other. Dudley Herschbach saw links between research on polymers and the outcome of World War II. The chemistry research allowed the United States to develop artificial rubber at a time when Japan sought to conquer all of the rubber tree-growing areas of southeast Asia.  

**Find a quiet place with few if any distractions.** Or maybe two or three of them. Some students believe that they learn best while listening to music, and some may. The research doesn’t give us definitive answers, but several studies have found that while introverts and extraverts will both learn less while listening to music, introverts will suffer the most. Other research finds that instrumental music works better than vocals, but both can be distracting. Much of the outcome may depend on you. Once more, examining your own experiences can help guide your decision. You must be honest with yourself, however, and distinguish between what you want to do and what really works.

**Exercise.** Recent years have produced considerable evidence that the brain and learning benefit from regular and steady exercise, adequate and scheduled sleep, and healthy and balanced diets. Studies have found, for example, that regular aerobic exercise can help increase the size of the hippocampus, an area of the brain that contributes to memory. Wendy Suzuki, a professor of neuroscience at New York University, found that students who did aerobic exercise for an hour before listening to a lecture did significantly better than students who didn’t. Paul Baker grasped something similar long before the medical research accumulated. Prior to each of those classes in the Integration of Abilities course, students did both vocal and physical exercises.

**Speculate, sometimes wildly, about possible solutions and connections even before you know anything.** When you encounter a math problem or a historical puzzle, begin to suppose this and that, playing with possibilities and developing tentative hypotheses but always recognizing that anything you might conjure out of your imagination has to be tested. Don’t just wait for someone to give you the answer.

**How Will You Write?**

Just write. A growing body of research tells us that putting words on paper (or a computer screen) can have enormous benefits, especially if you use that exercise to examine yourself, your life, your values,
and even your most traumatic experiences. Examples abound in the literature. As I noted in Chapter 3, physics students at the University of Colorado who wrote for fifteen minutes twice a semester on what they valued earned higher marks than their classmates who didn't. In Japan, investigators found that college undergraduates who wrote expressively about some traumatic experience in their lives improved their working memory capacity. At North Carolina State University, social scientists found similar results. Freshmen who wrote about their "thoughts and feelings" upon entering college improved their working memory significantly while those who penned essays on more trivial matters didn't. After decades of exploring the influence of expressive writing, the psychologist James Pennebaker sees even larger benefits. "When people transform their feelings and thoughts about personally upsetting experiences into language," he wrote recently, "their physical and mental health often improves."

"Write out your life story up to now, and write your reactions to everything we do," Paul Baker told his students early in the class. It didn't matter what they used, or even what they wrote. There was no right or wrong way to do it. Write in pencil, he instructed, "or with crayons. Whatever suits you." Most important, examine yourself and how you work. In his second exercise, Baker gave students a word and asked them to write whatever came to mind, to use stream of consciousness, to let their own words flow with no concern about form or the rules of writing.

In both Baker's class and in the psychological experiments, form and grammar rules didn't matter. Expression counted for everything. Writing with no standards in mind had huge benefits. But there comes a time in every student's life when their compositions must follow particular dictates. Honing one's writing skills is a matter of practicing diligently and listening to feedback. Is there anything from the lives and thinking of our subjects that might aid that process?

First, and most fundamentally, our most effective students recognize what's involved. "Learning to write," one person told us, "means joining a new community and accepting its standards." What makes something correct, and something else a mistake? A certain family of readers and writers has come to expect particular forms, and while those ideals vary, none of them emerged arbitrarily. They serve a purpose, worked out over centuries. They help make an essay compelling and clear, logical and persuasive. No language or punctuation is inherently "wrong." It is just different than what a certain community expects.

Second, good reading fosters good writing and vice versa. Like any wise novice, the best students pay attention to the tiniest devices of the masters of the language, recognizing good prose when they see it. Over time, they learn to emulate it. They pay close attention to the rules of language passed down over many generations of readers and writers, respecting the good ideas when they encounter them. Ultimately, however, they are willing to play with convention. They toy with sentences, twisting their parts one way and then another, discovering how the language works, learning what readers will expect, satisfying those needs, but also knowing how and where to employ the right surprise.

Finally, it takes time and dedication to write in ways that other people will want to read. People learn to write in a language by writing and getting feedback on their efforts, and our best students often sought classes that would give them that experience. But they didn't confine their efforts to school. Because they took a deep interest in their ability to think clearly and communicate, they worked
on it constantly. Neil deGrasse Tyson, the astrophysicist who has published nine popular books in science and numerous articles, struggled with his writing but admired the clarity and engagement of the prose he read in the *New Yorker* magazine. He set out to capture those same qualities in anything he composed. "I would look at the efficiency of the language and how interesting the juxtaposition of words became, and I would aspire to that," he explained. "It took me ten years before anything I wrote rivaled pieces that appeared in the *New Yorker.*"

Are You Going to Join the Club?

No, I'm not talking about whether to join a Greek fraternity or sorority. Only a handful of our subjects joined a fraternity, sorority, or social club; most didn't. I speak here instead about the decision to join a community of academic learners, with all their rules and expectations, from when you must finish your work to how you can use other people's ideas and language.

When anyone goes to college, they enter a strange new world that has been evolving for centuries. That "club" of academicians has developed its own book of regulations about a variety of matters. Unfortunately, no one has bothered to publish that volume in one place or even to record all of the ordinances in it. Some things are just understood and never explained to students. Going to college can be like arriving at the gates to some mysterious city and being told that you must guess every password that will allow you to travel through the streets. "I figured out very early," Sherry Kafka wisely observed, "that all schools are cultures, and my job was to go into that school and understand how that culture works."^24

Reading and writing may be treated very differently in physics

and math than in an English class. A paper submitted successfully in one might be given a low grade in the other. None of this is to say that the standards of college emerged without rhyme or reason. There is common ground among disciplines, and there are often good reasons why scientists write differently than journalists (although most scientists and academics in general could learn much from the way a good journalist uses language). But sorting it out does present challenges.

Students arrive at the gates of colleges from assorted backgrounds, each with a different level of understanding of the culture that awaits. All have the chance to decide whether they will join the club, play by the rules, or forever remain an outsider. That means learning, among other things, all the rules of citation and attribution, and what it means to plagiarize. The most successful college students found they could do this while still maintaining a strong sense of control over their own education. Let me illustrate further with one of the most important but still controversial aspects of that culture: the requirements on "late work."

Colleges often have rules about when you must do your work. Personally, I think these standards are the most difficult to defend, but most of my colleagues disagree. Great creative work doesn't always conform to some timetable. Yet meeting deadlines sometimes becomes a necessity in our fast-paced society. We think in terms of seconds whereas our distant ancestors, with far less sophisticated ways of measuring time, thought in seasons and years. I frequently tell students that unless you want to make this your life's work, you need to finish it and move on to other projects. I can't give you more time, I say. Only the Angel of Death can do that. If you take more time on this project, you must realize that you are taking time away from the rest of your life.
Sometimes, finishing your work by a certain date becomes important to the integrity of the learning community a student has joined. That was certainly the case in Derrick Bell’s law school class at New York University. The whole educational experience depended on students reading each other’s work and responding to it. In most cases, however, the deadlines are set arbitrarily. But whether there are reasons for the “due date” or they result from professorial whim, wise students have to decide when to conform, when to move on, and when to challenge—or at least question. Some of our subjects chafed under strict guidelines and had to find teachers who exercised more flexibility. Eliza Noh found one such teacher when she was finishing her honors thesis following her sister’s suicide.

A few years ago, at Northwestern University, I was teaching a class on the Cold War. I had asked students to read Mark Danner’s heart-wrenching account, *The Massacre at El Mozote*. Danner, a journalist, tells the story of how American-trained troops had entered a small village in El Salvador in December 1981 during the country’s civil war and butchered every man, woman, and child, save a few who had crawled in the bushes to escape. Danner had called the event a metaphor for the Cold War, implying that the international conflict was something more than just a struggle between the United States and the Soviet Union. I had asked students to read Danner’s account and to ask themselves whether his characterization captured the full meaning of this event.

In the days that followed our initial discussion of the book, Joel, a student in the class, approached me with a special request. He had taken a deep interest in the events of the story, and he wanted to do his term project on what had happened and why. I had invited each student to pursue a historical question, gather evidence, draw conclusions, and then share their work. “You can write an essay advancing your historical argument,” I told them. But I always added, half joking, “you can make a film, or write a play. But I’m primarily interested in your research and reasoning abilities.” Most students wrote a conventional paper. But not Joel.

He wanted to write a play that would capture what had happened at El Mozote, what it represented in the Cold War, why the Reagan administration had sought to repress any knowledge of the events, and why the American press corps had largely ignored or denied the massacre. To do so, however, he needed to do more research.

I can’t do that, he told me, unless I have more time. “I’ll need an extension for the class.” Because Northwestern, and schools like it, place heavy emphasis on finishing the degree in four years, the dean’s office frowned on giving students extensions. But I agreed to Joel’s request, and that summer, he did more research and wrote his play. In the fall, he gathered a cast of student actors, lighting technicians, and set and costume designers. He put everyone through a seminar on the Cold War in Central America in the 1980s, rehearsed the cast, and mounted the production for a two-week sold-out run on campus.

But the story didn’t end there. The events of El Mozote continued to haunt Joel, and a year later, after he graduated from college, he traveled to El Salvador in search of more insights. He spoke Spanish but also hired an interpreter, and went looking for anyone who could tell him about the civil war in that country. He read through the forensic reports that Argentine researchers had compiled when they dug up more than 300 mutilated bodies, and he found Rufina Amaya, the woman who survived by hiding in the bushes while listening to her nine-year-old son cry out, “Mama, they are killing me.”

“That trip to El Salvador had a profound influence on my life,” Joel reported later. He stayed for a while in the refugee camp where many of the local peasants had fled during the war. He heard stories...
of unspeakable horror, including the account of a woman who had lived for several years up in the mountains trying to escape the violence below. She had been carrying her baby son when she was caught in the crossfire between competing groups and had run for miles to escape the violence, only to discover when she finally stopped that her child had been shot through the head. She buried the infant, but “went crazy” and lived for several years high in the mountains, wandering mostly naked and living like an animal. Finally, troops of the Farabundo Martí National Liberation Front (FMLN) found her and brought her back to civilization. Joel met her in a refugee camp where she lived.

After those encounters, Joel reported, “I decided that I wanted to do something to help people and bring a little justice to the world.” He entered the University of Arizona law school and a joint program in Latin American studies. When he finished with that work four years later, he had both a law degree and a master’s in Latin American studies. After passing the bar, he took a job with the Public Defenders Office, and now brings legal services to the poor. We first met him in Chapter 2. “I can’t change the whole system,” Joel Feinman observed recently, “but I can help individuals, bringing a little justice into their lives. My trip to law school and to this important work began by reading that book and taking that trip to El Salvador in search of El Mozote.”

His work in my class was more than six months past the deadline, but did that really matter?

What Will Rock Your Boat?

We return to the question that began our discussion and to a central point about success and creativity that our subjects reflect. You don’t become creative simply by deciding that you will be creative. You don’t become successful by deciding that you will be successful. You don’t even focus on yourself. Yes, you do need to develop that conversation with yourself to understand how you operate. But your focus should be on what you want to learn, see, do, and change; what questions you have; what passions drive you—not on your own emotions or desire to be creative. If you focus exclusively on short-term success or on how famous you want to be with your creativity, you are unlikely to achieve success, creativity, or fame. Our subjects found something in the world that interested them more than themselves. Success and creativity—and sometimes fame—emerged as a by-product of full engagement with the problem or task at hand. You have to care about something and let your passion drive your life.
**Epilogue**

College students today face enormous pressures that many of our subjects never endured, or at least not to the same degree. Social, economic, political, and cultural forces compel them to follow a surface or strategic approach to their studies. With the cost of higher education rising and public financial support declining, many students face substantial debts to pay for their education. They often feel pressured to finish school as quickly as possible in order to reduce those debts and begin earning money to pay them back. They emphasize making money over every other goal in life, and fear for their future if they don’t. And who could blame them? Many have to take jobs while going to school, reducing their opportunities to follow their own curiosities and take a deep approach. Deep learning requires time, and that’s a luxury many believe they cannot afford. Under those circumstances, routine expertise may sound good enough and adaptive expertise far beyond their grasp.

For generations, some students have experienced an educational system that emphasizes surface and strategic learning. Indeed, that emphasis has grown in many places. Societies want to know whether students are learning and if education is a worthwhile investment, and they have imposed standardized tests on teachers and students to find out the answers. Those tests change everything, often encouraging everyone to emphasize rote memorization rather than understanding.

Even in the absence of pressure to achieve on standardized tests, some educators prize surface learning in the mistaken belief that it will suffice for some. “We need some surface learners,” a professor told me recently, “who just know how to do the routines of life and their job.” He had no sense that understanding might enhance recall or that everyone will face tough questions that require the ability to think and understand. The routine expertise his students acquire in college may quickly become outdated and stale. Pity his students, but they are not alone. All students encounter some educational experience that encourages them to think of learning as simply the ability to remember. Even the best schools often urge students to look for shortcuts. “When I entered college, and even in high school,” a student explained, “all my counselors were telling me how to get required courses out of the way.”

It takes enormous courage and dedication to take control of your own education and achieve the goals discussed in this book. Yet it is probably the only approach that makes any sense of the college experience, and certainly the one most likely to bring you self-satisfaction. No one can guarantee your long-term success in any sense of that word, but you can equip yourself with the skills for lifelong learning and adaptability, no matter what surprises the future has in store for you. In this book I have offered examples of many people, some from tough circumstances, who have surmounted obstacles and found their chosen life path. Most saw occasional failure or setbacks as events that helped them to understand themselves, seek new opportunities, or refine their goals. You should remember that you too will have time to mess up and recover if you take the right approach to all those disappointments. If you learn to realize the special contributions you can make and develop the capacity to benefit from other people’s creations, you can flourish as a curious, creative, and critically thinking individual.