Howard

GARDNER

Five Minds for the Future

THE LEARNING & MIND SERIES

Instructor's Package

About this Guide

This guide is intended to assist in the use of the DVD *Five Minds for the Future* for instructional purposes.

The following pages provide an organizational schema for the DVD along with general notes for each section, key quotes from the DVD, as well as suggested discussion questions relevant to the section.

10573 W. Pico Blvd. #162 • Los Angeles • California 90064 • 800.732.7946

FIVE MINDS FOR THE FUTURE

Summary:

In **Five Minds for the Future**, Howard Gardner examines how contemporary trends—globalization, the biological and digital revolutions, and lifelong learning—will affect education and human thought; he also puts forth his theory of the five minds that should be valorized in our time ("disciplined," "synthesizing," "creating," "respectful," and "ethical"). He shares the research findings of the GoodWork Project and looks ahead to how we might nurture and cultivate ethics and good work in the years ahead.

Structure:

Part 1. Megatrends

Part 2. Five Minds: The Cognitive Sphere

Part 3. The Sphere of Human Relations

Part 4. The "Triple Helix" of Good Work

Part 5. Minds in a Digital Age

Part 1. Megatrends

Gardner launches his presentation with the four megatrends that he says will shape the process of learning in the future: globalization, the biological revolution, the digital revolution, and lifelong learning. Turning first to globalization, Gardner points to the emergence of mega-cities, the proliferation of brands; the massive, constant movement of moneys, and our ensuing economic interdependency; and the movement of human beings as immigration has soared.

Moving on to the biological revolution, Gardner notes that in the twenty-first century, our learning and teaching will be increasingly affected by our knowledge of the brain and genetics. While this burgeoning knowledge about both individual differences and universalities doesn't necessarily mean we should teach *differently,* Gardner notes that educators must stay abreast of scientific and medical discovery.

Next, Gardner points out the pervasiveness of the digital revolution, from multi-user games and Wikipedia to social networks and Twitter. He cautions that much of this technology—for example, social networks—can be used for good or for ill, and that we must make sure technology is, as much as possible, used in benign ways.

The fourth revolution concerns lifelong learning: As people remain active longer, how do we promote and accommodate learning throughout the lifespan? Gardner urges us to examine its process and ramifications. In the future, he says, some of that lifelong learning will take place through massive open online courses ("MOOCs"); some will involve learning in groups; and some will be autodidactic. The common thread is that, whatever profession or sphere one finds oneself in, it is increasingly necessary to continue learning so as not to fall behind.

Discussion questions continued on next page.

Points for discussion related to this section:

Gardner mentions the challenges of immigration, or the movement of people. How does this phenomenon line up with the motion of brands, fads, and the media? How might the challenges of immigration reflect broader challenges of the digital age?

Discuss how teaching methods might be affected by knowledge of the brain and genetics. What opportunities and challenges might this knowledge present?

Discuss the limitations to and opportunities for learning that students' access to the Internet presents. What role do you see for "smart" technology in the classroom? What risks can you imagine?

What might be some ramifications of an aging population's pursuit of lifelong learning? What opportunities does that continuing education present?

Part 2. Five Minds: The Cognitive Sphere

Three Senses of Discipline

- SELF Working steadily and improving
- SCHOOL Learning major ways of thinking: historical, artistic, scientific, mathematical
- WORK Becoming an expert in a profession, craft, art, or ending up unemployed or working for a master/ expert

In examining his theory of the five minds, Gardner turns first to the three cognitive minds ("disciplined," "synthesizing," and "creative"). He begins with the "disciplined mind," delving into three types of achievement that underpin its work. The first of these is the centuries-old notion of improving one's knowledge and skills through practice; the second involves learning the major ways of thinking developed by scholars (history, art, science, and math); and the third requires becoming very good at something (for example, achieving expert status as an artist or professional). The importance of this third element is unprecedented, says Gardner, because as so many traditional jobs disappear, we must be "a step ahead of the latest technological inventions" to have an outstanding professional life.

Specimen Scholarly Disciplines that Describe the World

- Science (correlation not same as causation; matters of evidence vs faith, opinion)
- History (role of human agency, no experiments possible, avoid presentism, each generation rewrites)
- Each discipline features its own METHODS

Gardner lingers on the relationship between the "disciplined mind" and the scholarly disciplines. Various disciplines offer different ways to explain the world, he says: Whereas science emphasizes the accrual of evidence and the distinction between correlation and causation, history involves a vast leap of the imagination and is inevitably a conversation between who we are now and who we believe we were in the past. The disciplined mind must master many ways of thinking in order to understand the world—and in order to master those ways of thinking, it must become agile with the methods of each discipline.

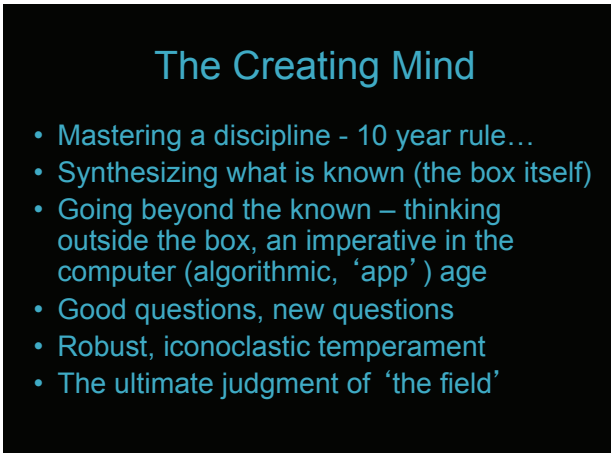
The Synthesizing Mind

- Scads of information, especially on the web
- Largely undigested and unevaluated
- The synthesizing imperative
- Good, bad, and "so-so" syntheses
- Psychology (my discipline) has dropped the ball

In describing the "synthesizing mind," Gardner points to Charles Darwin as one of history's great synthesizers. After his five-year sailing trip around the world on the HMS Beagle, Darwin spent twenty years mulling over what he'd seen. Many consider the book he wrote in that time, *On the Origin of Species*—in which he laid out the fundamental rules of human evolution, variation, and survival of the fittest—to be one of the greatest works of synthesis ever achieved. The hallmark of the synthesizing mind, according to Gardner, is that it takes in hordes of information and tries to make sense of it. In the digital age, with its inundation of information, the synthesizing mind is particularly relevant. Gardner cautions, though, that not all syntheses are good—and that psychology has

long neglected to examine what makes for good and bad syntheses.

Gardner outlines several habits of the synthesizing mind. First, he says, one must consider the goal or ultimate morphology of one's synthesis—for example, a website, a performance, a term paper, or a speech. From there, one must take in earlier syntheses, being careful not to simply repeat what has already been created, and process relevant information in a non-judgmental way. Next, one must choose a method or strategy (for example, metaphors, images, equations, taxonomies, or schemas)—and here, Gardner emphasizes that one should use whatever method of organization seems the most appealing and appropriate, and that a good teacher ought to present students with a range of methods. Once one has completed an early draft, Gardner continues, it should be distributed both to those who know more and to those who know less; this will ensure that the piece passes muster with experts, but also makes sense to novices and helps them learn. Gardner acknowledges that this can be a difficult process, but argues that with practice, our synthesizing skills can improve.



Moving on to the "creating mind," Gardner chooses Albert Einstein as an exemplar. He cites the "ten year rule"—the observation that most people must work hard in a discipline for at least a decade in order to master it. Much of that time, he argues, is spent synthesizing what has already been done, for in order to create something new, it helps to know what already exists. The "creating mind" then goes beyond this known world to ask new questions; and in asking those questions, "creating minds" raise new dilemmas and ideas. It helps, then, that creators typically have robust and iconoclastic temperaments, and are willing to face and learn from failure. In fact, temperament may be as essential as (or more essential than) cognition: Creative people *want* to be creative, says Gardner; they like to take risks; they try things out and rebound from their defeats. In other words, they do not adhere to a philosophy of error-free learning.

To this, Gardner appends a final note on the "creating mind": The ultimate judgment of creativity comes not from the creator, but from people who are well-informed in that particular area.

The three cognitive minds might thus be thought of as depth (the "disciplined mind"), breadth (the "synthesizing mind"), and stretch (the "creating mind").

Points for discussion related to this section:

What are the strengths of the "disciplined mind"? How do you see this mind meeting the challenges of different eras, such as the eras of farming, of factories, and of computers?

For what types of modern problems might the "synthesizing mind" be especially well suited? What skills would the "synthesizing mind" bring to such dilemmas that the "creating mind" or the "disciplined mind" might lack?

How might a philosophy of "error-free learning" interfere with the work of the "creating mind"? Discuss Gardner's assertion that for the "creating mind," temperament may be more important than cognition.

Part 3. The Sphere of Human Relations

Moving on from the three cognitive minds, Gardner ushers us into the sphere of human relations and the final two types of mind: respectful and ethical.

The Respectful Mind

- Diversity as a fact of life, at home and abroad
- Need to understand others – perspectives, motivation – emotional and interpersonal intelligence 'schools with empathy'
- Beyond mere tolerance
- Inappropriateness of 'corporate, top-down model' for schools and perhaps even for corporations!

The "respectful mind" embraces diversity as a fact (and a gift) of life. This mind goes beyond mere tolerance, and is motivated by a need to understand others' perspectives and motivations.

Here, Gardner notes how challenging it can be to create a respectful environment in a hierarchical organization. He then describes the qualities he looks for in a respectful environment—for example, how conflict is handled, and what sorts of "conditions" must be met for respect to be offered (ideally, respect should be generous and forgiving). As examples of respectful environments, Gardner cites commissions on peace and reconciliation, as well as international athletic and musical events; the key here is that groups promote intercultural respect and understanding.

Gardner also notes the importance of respectful institutional cultures—particularly in communities with conflicting messages at home and on the street. But how to establish such a respectful culture? This is an enduring question: Flourishing models of respectful exchange are rare, and because historical memory looms large, respect across cultures and religions can be a difficult and dangerous thing.

Ethical Mind

- Higher level of abstraction than respectful mind
- Conceptualizing oneself as a (good) worker
- Conceptualizing oneself as a (good) citizen
- Acting appropriately in both roles
- Insights from the GoodWork project

Finally, Gardner describes the "ethical mind"—a disposition with a higher level of abstraction than the respectful mind, one that conceptualizes oneself as both a worker and as a citizen. "Ethical," cautions Gardner, is not at all the same as "moral," which might describe a traditional system such as the Ten Commandments: In discussing ethics, we are considering complex roles that people assume in complex contemporary societies—roles for which we do not have long biological or historical preparation. This mind is concerned with what makes one a good worker and a good citizen—notions that may change over the course of one's life, just as identities and occupations change. And it is equally concerned with *acting* in ways congruent with its ideals. Throughout the life course, this mind asks: Do we or do we not behave responsibly and live up to the highest expectations of our roles? Here, says Gardner, the ethical mind departs from the mind that is merely moral.

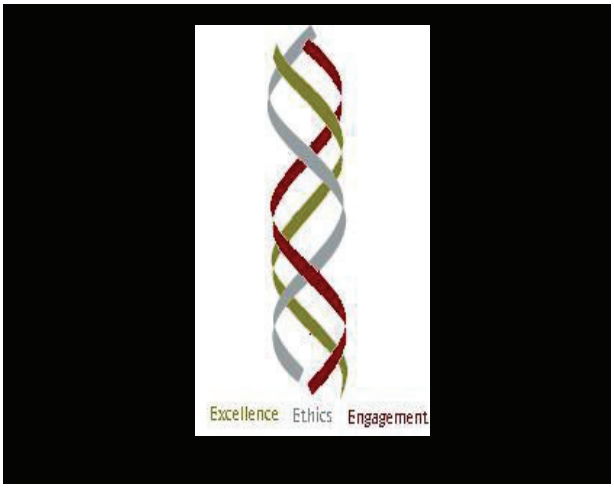
Points for discussion related to this section:

Think of a conflict at your school or institution, in your community, or in your home. What sorts of questions might the "respectful mind" bring to this conflict? How might such a thinker promote intercultural, intergroup, or interpersonal understanding?

Discuss the difference between ethics and morals. Why might morals, as Gardner defines them, function more effectively in relatively small groups than in large or virtual groups?

Discuss the difference between the "respectful mind" and the "ethical mind." What role might each one take at school or in the workplace?

Part 4. The "Triple Helix" of Good Work



Using the ethical mind as a launching pad, Gardner explores insights from the GoodWork Project, a decade of research that asked how people who want to do good work succeed or fail at a time of rapid change, during which technology is transforming our sense of time and space. Gardner and his colleagues conceptualized "good work" as work that embodies three "E"s: It is excellent (showing expertise or high quality); engaging (the worker looks forward to his or her work); and ethical or socially responsible (the worker's aim is to do "the right thing"). To illustrate this, Gardner displays a "triple helix," which his team of researchers has called "ENA." Gardner emphasizes that having one or two of the three strands (excellence, engagement, and ethics) is not enough: The prototypical good worker needs all three strands. Gardner notes that these qualities also apply to citizenship: A good citizen knows the laws, cares and keeps up with what's happening, and considers the larger polity, not just his or her selfish desires.

Here, Gardner explores a distinction between ethics and morality: Morality is how we deal with the community of people we see daily, those whom we evolved to be with. Ethics, in contrast, comes into play in complex societies in which much of our contact is intermittent or virtual. In these worlds, ethics encompasses the ways in which we fulfill our professional and civic roles. Yet there is no place to look up guidelines for good behavior; rather, we must think through what qualities can make us good people, good workers, and good citizens.

Gardner next turns to his study of "good work" in youth. In conversations with more than 100 youth ages fifteen to thirty, many of whom were launching their careers, Gardner and his colleagues realized that a certain type of rationalization was rampant: Young people asked themselves, "Why should I be more ethical than my peers seem to be?" These interviewees prioritized being monetarily successful, and convinced themselves that because their competitors seemed not to be behaving ethically, they could not afford to be ethical either—and so they rationalized and told themselves they'd behave ethically in the future instead of the present. Concerned about these young people's self-deception, researchers created GoodWork curricula in order to raise these ethical issues among young people before they venture out (or advance very far) into their careers; both undergraduates and secondary students have participated in those curricula and the ensuing conversations.

Here, Gardner urges educators to push their students to consider ethical dilemmas. He cites the example of a high school newspaper editor whose grandfather was a prominent news reporter. When the

Three Kinds of Good

- Good person (moral to your neighbors)
- Good worker (member of a profession/ guild)
- Good citizen (of various polities, from campus to city to nation to the planet)

Compromised Work in American Youth

- Students/young workers know the "right thing to do"
- Some do it
- But too many deceive others and themselves—why should I be more ethical than my peers seem to be?
- Is it enough to *intend* to use proper means in the future?

headmaster of the school asks her not to report on an on-campus rape, the student turns to her mother for advice; the mother, in turn, says that although her grandfather would be proud of her for reporting the story, the student's brother is hoping to attend that school next year—and his admission could be jeopardized by the student's behavior. In a second example, Gardner describes the predicament of a skilled but demanding chemistry teacher whose students begin to observe that others are getting into college and winning prizes with greater frequency due to their higher grades; this teacher is caught between being an objective judge of students and nurturing his students in the way they would like. As a third example, Gardner offers the controversy over WikiLeaks and the release of unedited documents, a process that can enhance government transparency, but can put national security at risk.

By presenting such dilemmas when students are young and the stakes are manageable, says Gardner, educators may be able to stem the tide of unethical behavior and dubious rationalizations in the workplace. But how can one intervene once young people *have* moved on to the professions? Gardner suggests a physical or virtual "commons" in which people in a given field can reflect on dilemmas and possible solutions. In this commons, professionals of all ages would work together, offering input on what they might do in a given situation and brainstorming how to behave in an ethical way.

Points for discussion related to this section:

Gardner notes that in the GoodWork Project, the attitude of delaying ethical behavior was rampant among young people. What factors in recent decades might help explain this phenomenon? How might it be part of the unique challenges that we face in the digital and biological revolutions?

Consider the "triple helix" of excellence, engagement, and ethics. Among the young people who said they would behave ethically *later,* how do you imagine that any of these three factors were missing or frayed in their work? Taking the areas one at a time, how might problems in any one of them lead to an ethical lapse or a postponement of doing the right thing?

Imagine offering a set of hypothetical ethical dilemmas to a classroom that includes each of the five minds: disciplined, synthesizing, creative, respectful, and ethical. How might you craft an ethical situation that is uniquely challenging for each of these minds? For instance, what sort of dilemma might be most challenging for the synthesizing mind? For the respectful mind? Craft hypothetical ethical dilemmas for each of the other three minds as well.

Discuss the idea of a virtual "commons" in which professionals could reflect on how to behave ethically in various dilemmas. What rules and features might you add to this commons? What prohibitions or admonitions might be necessary? How might a commons dedicated to *personal* rather than professional ethical dilemmas differ in content, tone, and rules?

Part 5. Minds in a Digital Age

Five Minds in a Digital Age

- Discipline– depth could lose out to breadth– can one learn methods online or is an offline face-to-face apprenticeship essential?
- Synthesis– can one organize the deluge of information? What kinds of aids to synthesis will be developed? Will the "apps" be limiting or liberating?

Examining what will happen to the five minds in a digital age, Gardner turns first to the disciplined mind, and to his worry that depth might lose out to breadth. With all the enticements and distractions of the digital revolution, working steadily in the same field can be more challenging. He raises questions about the possible limitations to online learning, and asks how much face-to-face apprenticeship might be necessary in various fields.

Five Minds in a Digital era

- Creativity -- web 2.0 is promising, but many young people are risk averse and careerist; pros/cons of an 'app world'
- Respectful/Ethical -- Perhaps to inner circle but not necessarily to the wider community, how to become a 'cyber citizen' mastering the ethics of roles in the new, virtual "Wild West"

Turning to the synthesizing mind, he asks how we might organize the current (and coming) deluge of information. Gardner posits that we cannot do this on our own—and suggests that aids to synthesizing, such as "apps," remain inadequate. In the future, he says, we will have to continue asking with every new opportunity or device: Does this liberate me or hinder me?

He cautions that while the "creating mind" is now in a time of great promise, many young people in the present era are risk-averse and careerist; although the options for creativity are in some ways at a peak, it is not yet clear whether we will leverage these options into a golden age. One possibility is that while the current iteration of technology supports an "intermediate amount" of creativity, it may not stimulate creativity at the highest levels.

Nurturing five minds

- Awareness of these five minds
- Examples from history or current events
- Modelling and explicating positive examples
- Calling attention to negative examples, with appropriate consequences
- GoodWork efforts with high schools, colleges, institutions of professionals
- The ultimate challenge of personal synthesis (a task for each of us!)

For the respectful and ethical minds, Gardner offers the challenge of mastering the ethics of roles in the new digital "wild west"; these include issues of identity, privacy, ownership, and citizenship. He asks us to reconsider what it means to have a sense of privacy when almost anything we create can be transmitted? And what does it mean to participate in community when that community might be widespread and even unknowable?

How, then, can we as educators nurture these five minds? For one thing, it is useful simply to be aware

of them. But we must also present students with examples—from literature, current events, history, and elsewhere—of respectful and disrespectful behavior and of helpful and unhelpful syntheses. Gardner notes the challenges in holding these five minds in balance: What happens, for instance, when someone we respect does something unethical? Or when a creative act feels disrespectful?

Finally, Gardner leaves us with fundamental questions about the future of education. Using art history's "figure-ground" model—in which the painting background supports the dominant figure—he asks what the "figure" might be in the future of education: test scores and national rankings, or the individuals and society that education creates? While it is good to have disciplined, creative synthesizers, Gardner says, we also need respectful and ethical thinkers in a society in which people pay attention to each other, help each other, and try to do good work.

Gardner leaves us with closing thoughts on intelligence and character from Martin Luther King, Jr.: "Intelligence plus character—that is the goal of a true education." Gardner agrees with King, and notes that while the three cognitive spheres ("disciplined," "creating," and "synthesizing") are important, a full education must include character, respect, and ethics as well.

Points for discussion related to this section:

How do you see the different types of mind—"disciplined," "creating," "synthesizing," "respectful," "ethical"—as having particular strengths in the digital age? How is each uniquely suited for the new frontier?

What do you see as the particular vulnerabilities of each type of mind in the digital age? Why?

Discuss Gardner's notion that the digital revolution could support an "intermediate amount" of creativity. Why might this be the case? Are there ways in which either more technology or less technology might support those higher levels of thought and achievement?

How might we eventually measure the success of education according to Gardner's model—the cultivation of good workers, citizens, and people? Is any barometer possible? Is it necessary?

The Problem by Howard Gardner

We cannot know at which point in pre-history, human beings began to prepare for the future. Nor can we know at which point human beings began to prepare their children or grandchildren for a world that might differ significantly from the one with which they themselves were familiar. In any case it seems safe to assume that by the millennium before Christ—sometimes called the Axial age—human beings were already pondering the fate—and hence the future—of young persons. Such a concern with the formation of youth took place in designated schools, informal apprentice settings, places of worship, or in the agricultural, mining, or trading communities in which families lived and worked.

Such forward-looking thinking presumably assumed many forms: development of skills in arts and crafts; training of courage and leadership; participation in ceremonies and rituals; preparation for an after-life and, eventually, mastery of the basic literacies. Numerous agents were involved: parents, other family members, religious figures, leaders of the collectivity, as well as masters and mentors. And various media were drawn upon, ranging from inspirational songs to literary, graphic, and dramatic work that celebrated heroes.

That said, an *explicit* concern with the future—particularly one whose form is difficult to anticipate—may be a relatively recent phenomenon. Perhaps explicit attention may be a dividend of the Enlightenment's belief in continuing progress as opposed to, say, a cyclical or dystopic pattern of change. The notion of 'future shock,' the role of 'futurist' arose within recent memory. By the same token, an explicit concern with the human mind—as opposed to the entire person or human character or a repertoire of behaviors—reflects Western thinking, perhaps dating back to the Greeks, and given impetus by the Cartesian tradition of the 17th century and the subsequent writings of Immanuel Kant.

Nonetheless, at the start of the third millennium, we are well attuned to considerations of the future. As one who has witnessed discussions of the future in many corners of the planet, I can attest that belief in the power of education—for good or for ill—is ubiquitous. To be sure, our conception of the mind continues to change—say, from the Freudian unconscious of 1900 to the information processing device of 2000. Yet we have little difficulty in seeing education as an enterprise—indeed, the enterprise *par excellence*—for shaping the mind.

In what follows, summarizing a forthcoming book Five Minds for the Future (2007), I portray the kinds of minds that we should cultivate in the future. Specifically, I introduce three kinds of minds that are primarily cognitive: the disciplined mind, the synthesizing mind, and the creating mind. Complementing this cognitive emphasis, I then describe two minds that deal with the human sphere: the respectful mind and the ethical mind. In each case I indicate the major features of this form of mind: the ways in which it can be shaped; the ways in which it can be distorted or misshaped. In conclusion, I describe some of the tensions among these kinds of minds and offer suggestions of how one might integrate these minds further in a single productive human being.

Clarifying Comments

Before plunging into this synopsis, I should make a few clarifying comments. To begin with, though I focus on the future, I possess no crystal ball. As Marshall McLuhan quipped, "it is difficult to make predictions, especially about the future." In conceptualizing the future, I refer to trends whose existence is widely acknowledged; the increasing power of and reliance on science and technology, the interconnectedness of the world in economic, cultural, and social terms, the incessant circulation and intermingling of human beings of diverse

backgrounds and aspirations, and, also, their periodic clashing. I should add that none of these five minds is exclusive to the future: one could have called for them fifty or perhaps even 500 years ago. Yet, their cultivation assumes particular urgency at the present time.

A second point concerns my stance. I intend to be both description and prescriptive. I am descriptive in the sense that I seek to explain how these minds work. I am prescriptive in the sense that I believe we need to cultivate these kinds of minds. Certainly, we will not thrive as individuals and as societies unless we have a generous dosage of these minds. It is possible that the cultivation of the respectful and ethical mind will determine *whether* we survive as a species.

A third point concerns the scope of the enterprise. I use the word 'education', an allusion that immediately evokes thoughts of school. And of course, during the first years of life, school has become the principal venue in which minds are cultivated. But nowadays, and perhaps for the indefinite future, education will take place in all kinds of venues and continue throughout one's productive life. And so the minds under discussion here are as much the concern of the fifty year old executive or manager as of the teacher or mentor. Moreover, individuals must tend to the development of their own minds, as well as the minds of individuals—offspring, students, employees– over whom they have responsibility.

Finally, as the individual who developed the concept of multiple intelligences, I need to forestall a possible confusion. When I wear the hat of a student of individual differences, I describe human beings as exhibiting different intellectual strengths and different intellectual profiles: thus Wystan excels in linguistic intelligence, while Pablo is strong in spatial intelligence (Gardner 2006). But when I wear the hat of an educator, in the broad sense just described, I call for the development in each person of all five kinds of minds—and considerations of differences among individuals fade into the background.

So much for preliminaries—one by one, let me bring the minds onto center stage.

The Disciplined Mind

In English, the word 'discipline' has two distinct connotations. As to the first, we speak of the mind as having mastered one or more disciplines– arts, crafts, professions, scholarly pursuits. By rough estimates, it takes approximately a decade for an individual to learn a discipline well enough so that he or she can be considered an expert or master. In most cases, such mastery is acquired through some kind of tutelage—either formal, in a school, or less formally, through some combination of apprenticeship and self-instruction.

Perhaps at one time, an individual could rest on her laurels once such disciplinary mastery had been initially achieved. No longer! Disciplines themselves change, ambient conditions change, as do the demands on individuals who have achieved initial mastery. Over succeeding decades one must continue to educate oneself and others. And such hewing of expertise can only continue if an individual possesses discipline—in the second sense of the word. That is, one needs continually to practice in a disciplined way if one is to remain at the top of one's game.

Once basic literacies have been mastered, the chief burden of educational systems around the world is the acquisition of an ensemble of scholarly disciplines. In my own work on precollegiate education, I have stressed four disciplines: mathematics, science, history, and at least one art form. I make a sharp distinction between subject matter and discipline. The subject matter of history consists of learning much detailed factual information about the past. Such television quiz show knowledge is always welcome and sometimes lucrative. But this amassing of information differs qualitatively from disciplinary competence. An individual who has acquired the discipline of history can think like a historian: that is, the student of history appreciates that she must work with textual,

graphic, and other kinds of records; those records must be reconstructed and interpreted; unlike science, historical events occur only once and cannot be replicated exactly or interpreted unambiguously; historians must impute motives to personages from the past; each generation will necessarily rewrite history; and yet historians are bound to respect the facts and to strive for as accurate and comprehensive a record as possible. The other major disciplines exhibit analogous regularities and constraints.

We first acquire a disciplined mind in school. But relatively few of us go on to become academic disciplinarians. The rest of us will master disciplines that are not, strictly speaking, scholarly. Yet the same need to master *a way of thinking* applies to the range of workers—whether one is dealing with professionals, like lawyers or engineers, or with those involved in business, be it personnel, marketing, sales, or management. Such education may take in formal classes or on the job, explicitly or implicitly. In the end, a form of mastery will be achieved, one that must continue to be refined over the years.

Nowadays, the mastery of more than one discipline is at a premium. We value those who are genuinely interdisciplinary, multi-disciplinary, or trans-disciplinary. But these claims must be cashed in. We would not value a bilingual person unless he or she can speak more than one language. By the same token, the claim of pluri-disciplinarity (if you'll excuse the neologism) only makes sense if a person has genuinely mastered two of more disciplines and can integrate them. For most of us, the attainment of multiple perspectives is a more reasonable goal.

With respect to any kind of mind, pathological forms exist. There is the individual who is overly disciplined: who approaches every issue, whether professional or personal, through the same set of beliefs and practices. One does not want the legal mind to approach every issue—at work, at home, in the bedroom—as if it involved legal reasoning and verdicts. There is the individual who, at one time, had mastered the discipline but who no longer keeps up—exhibiting the patina of the disciplinarian but no longer the requisite contents, skills, and understandings. And finally, there is the avowed interdisciplinarian, who may in fact be a jack-of-all-trades but the master of none.

The Synthesizing Mind

Murray Gell-Mann, Nobel Laureate in Physics and an avowed multidisciplinarian, has made an intriguing claim about our times. He asserts that, in the twenty-first century, the most valued mind will be the synthesizing mind: the mind that can survey a wide range of sources; decide what is important and worth paying attention to; and then put this information together in ways that make sense to oneself and, ultimately, to other persons as well.

Gell-Mann is on to something important. Information has never been in short supply. But with the advent of new technologies and media, most notably the World Wide Web, vast, often indigestible amounts of information now deluge us around the clock. Shrewd triage becomes an imperative. Those who can synthesize well for themselves will rise to the top of their pack; and those whose syntheses make sense to others will be invaluable teachers, communicators, and leaders.

Strangely, my own discipline of psychology seems to have dropped the ball in explicating the skill of synthesizing. Compared to a half century ago, we know a great deal about how individuals learn to read, calculate, master basic concepts in history, science, economics, or philosophy. But I have been unable to locate comparable syntheses about how one synthesizes.

Nonetheless, it is possible to identify the basic constituents of the process of synthesizing. To begin with, a person has to decide on the area that he or she wishes to synthesize. Sometimes, one has time to reflect on this; sometimes the demand for synthesis is pressing.

Let's take an example, from business. Suppose

that you are an executive and your company is considering the acquisition of a new company in an area that seems important but about which you and your immediate associates know little. Your goal is to acquire enough information so that you and your Board can make a judicious decision and you need to do so in the next two months.

The place to begin is with any existing synthesis: fetch it, devour it, evaluate it. If none exists, you turn to the most knowledgeable individuals and ask them to provide the basic information requisite to synthesis. Given this initial input, you then decide what information seems adequate and which important additional data are required. At the same time, and of great moment, you need to decide on the form and format of the ultimate synthesis: a written narrative, an oral presentation, a set of scenarios, a set of charts and graphs, perhaps an ordered list of pros and cons leading to a final judgment.

At last, the actual work of synthesis begins in earnest. New information must be acquired, probed, evaluated, followed up or sidelined. The new information needs to be fit, if possible, into the initial synthesis; and where fit is lacking, mutual adjustments must be. Constant reflection, regular tinkering, is the order of the day.

At some point before the final synthesis is due, a proto-synthesis should be developed. This interim version needs to be tested with the most knowledgeable audience of associates, preferably an audience that is critical and constructive. To the extent that time and resources are available, more than one trial run is desirable. But ultimately there arrives a moment of truth, at which point the best possible synthesis must suffice.

What kind of mind is needed to guide the synthesis? Clearly, though he should have "a home" area of expertise, the synthesizer cannot conceivably be up to speed on every relevant discipline. As compensation, the synthesizer must know enough about the requisite disciplines to be able to make judgments about whom and what to trust—or to identify individuals who can help make that determination. The synthesizer must also have a sense of the relevant forms and formats for the synthesis, being prepared to alter when possible but to make a final commitment as the deadline approaches. The synthesizer must always keep her eyes on the big picture, while making sure that adequate details are secured and arranged in useful ways. A tall order! It is quite possible that certain individuals are blessed with a 'searchlight intelligence'—the capacity to look widely and to monitor constantly, thus making sure that nothing vital is missing; and that they also have the capacity to value the complementary 'laser intelligence' that has fully mastered a specific discipline or problem area. Such individuals should be identified and cherished. But it is crucial that we determine how to nurture synthesizing capacities more widely, since this facility is likely to remain at a premium in the coming era.

Anyone who has read a clutch of textbooks, or attended a variety of weekend seminars, knows that not all syntheses are equally effective. Some syntheses are too sprawling—attempting to cover too much material. Some syntheses are too focused—they are really briefings for specialists, not nutrient for generalists. Some are too technical, others are too popular. Different aesthetics can also be brought to bear. I favor literary syntheses that make judicious use of organizers, stories, metaphors, and analogies. Others may prefer syntheses that are devoid of artifice, and that rely heavily on charts and graphs. The good synthesizer must know what works for him as well as for those who must make use of his synthesis.

The Creating Mind

Most artists, scientists, and scholars plough the same paths as their peers; most politicians and executives are substitutable for one another In sharp contrast to those conventional experts, the creating mind forges new ground. In the current popular argot, creators think "outside the box." In our society we have come to value those individuals who attempt new things,

monitor whether they work, keep casting about for new ideas and practices, pick themselves up after an apparent failure, and so on. And we give special honor to those rare individuals whose innovations actually change the ideas and practices of their peers—in my trade, we call these individuals "Big C" creators.

What is special about our time? Put succinctly, nearly every practice that is well understood will be automated. Mastery of existing disciplines will be necessary but not sufficient. Whether at the workplace or the laboratory, on the political platform or the theatrical stage, one is pressured to go beyond the conventional wisdom or the habitual practice—to try to get a leg up on what has been done before, and what is being done currently by oneself or one's competitors.

Of course, sheer innovation is much easier to accomplish than effective creation. I could write this essay in numerous ways that are original—for example, putting nonsensical phrases between every sentence. This insertion may well be an original act, but, so far as I can determine, such a ploy serves no useful purpose and is most unlikely ever to influence how future essayists proceed. Suppose, however, I devise a set of web linkages to key points, and those linkages can be varied, based on questions raised by a particular reader, or on a shrewd assessment of the interests and sophistication of a variety of audiences. Were such a practice desired, and my pilot work to prove successful, it is possible that such an innovation might eventually be judged as creative.

It is important to ascertain the relation among the three kinds of minds introduced thus far. Clearly, synthesizing is not possible without some mastery of constituent disciplines—and perhaps there is, or will be, a discipline of synthesizing, quite apart from such established disciplines as mathematics, mime, or management. I suggest that creation is unlikely to emerge in the absence of some disciplinary mastery, and, perhaps, some capacity to synthesize as well.

Nonetheless, we must bear in mind that the most creative instances of creating (!) typically emerge with individuals who are young—perhaps 20 or 30 in science or mathematics, perhaps a decade or so later in other pursuits. Disciplinary acumen and synthesizing capacities continue to accrue throughout a lifetime. This fact suggests to me that too much discipline, or excessive synthesizing, may actually prove counterproductive for the aspiring creator. The challenge is to acquire enough discipline and sufficient synthesis early in life, so that one can take the confident leap—go beyond what is known, and tweak it in new and unexpected directions.

As a student of creativity, I had long assumed that creating was primarily a cognitive feat—having the requisite knowledge and the apposite cognitive processes. But I have come to believe that personality and temperament are equally, and perhaps even more important for the would-be creator. Many of us know a great deal and most of us can continue to acquire knowledge and skills indefinitely. In addition the creator must possess a robust personality and temperament. More than willing, the creator must be *eager* to take chances, to venture into the unknown, to fall flat on her face, and then, smiling, pick herself up and once more throw herself into the fray. Even when successful, the creator does not rest on her laurels. She is motivated again to venture into the unknown and to risk failure, buoyed by the hope that another breakthrough may be in the offing, able to "frame" an apparent defect as a valuable learning opportunity.

I like the story that is told about Sigmund Freud. In 1909 he and his close associate Carl Jung went to America. It was Freud's first and last trip—he did not like the New World. Jung remained longer. He was lionized by audiences. With great enthusiasm, he wired back to Freud. "Great news: psychoanalysis big success in the United States." According to legend, Freud immediately wired back "What did you leave out?" Far from enjoying the acclaim, Freud was more intent in raising the tension, in going beyond anything

that smacked of easy acceptance or conventional wisdom.

In the United States I am often asked about how to cultivate creativity. I give two responses, neither of them expected or immediately popular. First of all, I talk about the need to pose challenges, obstacles, and boulders. One cannot build up a robust temperament without taking chances, failing, and learning that the world does not thereupon end. Of course, the frustrations have to be manageable; they cannot be allowed to break one's spirits. Second, I question whether it is important to cultivate creativity in American schools. That is because messages about the importance—the cash value—of creativity are ubiquitous in our society: on the streets, in the media, in the marketplace. Probably emphasis on disciplines and synthesis would yield greater dividends. But in other countries, where rote instruction is entrenched and innovations are greeted with suspicion, I would favor a curriculum and a pedagogy that is oriented toward the cultivation of the creative person and the discovery and exploration of the creative idea.

Until this point, I've reviewed the kinds of minds most familiar to me, as a cognitive psychologist. If I had written this essay a decade ago, I would probably have stopped here. But events have prompted me to postulate and ponder two additional kinds of mind—the respectful and the ethical. To begin with, there is my decade-long collaborative study of good work—work that is excellent, engaging, and ethical. This line of research has sensitized me to kinds of minds that I might otherwise have ignored. Then, in addition,

I have been disturbed by many social and political trends in our world. More and more, sheer cultivation of cognitive capacities, in the absence of the human dimension, seems a dubious undertaking. I agree with Ralph Waldo Emerson's assertion that "Character is more important than intellect."

The Respectful Mind

Almost from the start, infants are alert to other human beings. Absent frank pathology, even neonates display keen interest in anything that resembles a human face or voice. The attachment link between parent (typically mother) and child is predisposed to develop throughout the early months of life; and the nature and strength of that bond determines the capacity of individuals to form relationships with others throughout life.

Of equal potency is the young human's capacity to distinguish among individuals, and among groups of individuals. Within a few months, the infant can distinguish his mother form other young females; by the end of the first year of life, the infant recognizes, and can modulate his reaction to, a range of individuals in his environment. And by the age of two or so, the toddler is able to make all manner of group discriminations: male vs. female, young vs. old, familiar vs. unfamiliar, and, most revealingly, classification of members of different racial and ethnic groups.

We are wired to make such distinctions readily; indeed our survival depends upon our ability to distinguish among those who are likely to help and nourish us, and those who might do us harm. But the messages in our particular environment determine how we will label particular individuals or groups. Our own experiences, and the attitudes displayed by the peers and elders to whom we are closest, determine whether we like, admire, or respect certain individuals and groups; or whether, on the contrary, we come to shun, fear, or even hate these individuals.

At a time when human beings met only a few hundred people at the most, the nature of their interpersonal or inter-group attitudes was of less moment. But we live in an era when nearly every individual is likely to encounter thousands of individuals personally, and when billions of people have the option of traveling abroad or of encountering individuals from remote cultures through visual or digital media.

A person possessed of a respectful mind welcomes this exposure to diverse persons and groups. Such

a person wants to meet, get to know, and come to like individuals from remote quarters. A truly cosmopolitan individual gives others the benefit of doubt; displays initial trust; tries to form links; avoids prejudicial judgments. To be sure, such a posture is not uncritical or automatic; it is possible for another individual to lose one's respect, even to earn one's distrust or hatred. But the respectful mind starts with an assumption that diversity is positive, and that the world would be a better place if individuals seek to respect one another.

The threats to respect are intolerance and prejudice. A prejudiced person has preconceived ideas about individuals and groups, and resists bracketing those preconceptions. If I am a disrespectful straight white American and you are German, or a black, or a homosexual, I will assume that you are no good, distance myself, miss no opportunity to put you down verbally or physically. An intolerant person has a very low threshold for unfamiliarity; the default assumption is that "strange is bad." No matter what you look like or who you are, if I don't already have a reason to embrace you, I won't.

Sham forms of respect exist. For example, I might "kiss up and kick down". That is, so long as you have power over me, or can do me a favor, I will treat you well; but once I am in a more important position, I won't give you the time of day. Or I might respect you publicly, but once you have left the room, I will make fun of you or the group to which you belong.

It is not easy to come to respect others whom you have feared, distrusted, or disliked. Yet, in an interconnected world, such a potential for growth, for freshly-forged or freshly-renewed respect, is crucial. In war torn lands, commissions of truth and reconciliation have taken on deserved importance; and at least at times, they succeed in reconstituting ties that have been badly frayed. When countries have been at loggerheads, common athletic events (ping pong diplomacy between Chinese and Americans) or cultural events (orchestras composed of young Israelis and Palestinians) can sometimes pave the way for a reconciliation with 'the other.' When it comes to the causes of terrorism, these are no quick fixes; only genuine respect, nurtured and earned over the decades, can reduce the appeal of terrorism.

The Ethical Mind

The road to respect is paved from the earliest age, one brick at a time. An ethical stance is in no ways antithetical to a respectful one, but it involves a much more sophisticated stance toward individuals and groups. A person possessed of an ethical mind is able to think of himself abstractly: she is able to ask "What kind of a person do I want to be? What kind of a worker do I want to be? What kind of a citizen do I want to be?" Going beyond the posing of such questions, the person is able to think about herself in a universalistic manner: "What would the world be like, if all persons behaved the way that I do, if all workers in my profession took the stance that I have, if all citizens in my region or my world fulfilled their roles in the way that I do?" Such conceptualization involves a recognition of rights and responsibilities attendant to each role. And crucially, the ethical individual behaves in accordance with the answers that she has forged, even when such behaviors clash with her self interest.

My own insights into the ethical mind come largely from a dozen years of study of professionals who are seeking to do good work—work that is excellent, engaging, and ethical (Gardner, Csikszentmihalyi, and Damon 2001). Most individuals admire good work and want to achieve it—that is, they would like to behave, and they would like others to behave, in ways that are ethical. But this wish does not translate automatically or smoothly into reality. Determining what is ethical is not always easy, and such a determination can prove especially challenging during times like our own, when conditions are changing very quickly, and when market forces are powerful and often unmitigated. Even when one has determined the proper course, it is not always easy to behave in an ethical manner; and that proves

particularly so when one is highly ambitious, when others appear to be cutting corners, when different interest groups demand contradictory things from workers, when the ethical course is less clear than one might like, and when such a course runs against one's immediate self interest.

While conceptualizing the ethical course is not within the province of most children, the building blocks for an ethical life can be identified: the words and actions of respected elders at home, at school, and in the community. It is so much easier, so much more natural, to develop an ethical mind when one inhabits an ethical environment. When adults are reflective about their decisions, and explicitly cite moral concerns, young people "get the message" even when the details elude them. But such an environment is neither necessary nor sufficient. Crucial contributions are made by the atmosphere at one's first places of work: how do the adults in power behave, what are the beliefs and behaviors of one's peers, and, perhaps above all, what happens when there are clear ethical deviations, and—more happily if less frequently—when an individual or a group behaves in an ethically exemplary fashion. Education in ethics may not begin as early as education for respect; but neither 'curriculum' ever ends.

Given the high standards necessary for an ethical mind, examples of failures abound. It is not difficult to recognize behaviors that are strictly illegal—like theft or fraud—or behaviors that are obviously unethical—the journalist who publishes a story that he knows is not true, the geneticist who overlooks data that run counter to her hypothesis. More subtle to discriminate are instances of compromised work—the journalist who fails to confirm a tip before publishing, the geneticist who elects quick publication over running an indicated control group. Institutions and societies can be undermined by compromised work as well by bad work; the former may occur more slowly, but unless the trends are reversed, the undermining of the profession is equally decisive.

My examples of ethics have been drawn from the professional world, the one that I've studied. But none of us are not simply professionals: we are also family members, citizens of a community, and inhabitants of the world. In each case, the ethical mind must go through the exercise of identifying the kind of individual one wants to be. And when one's own words and behaviors run counter to that idealization, one must take corrective action. I would add that as one gets older, it does not suffice simply to keep one's own ethical house in order. One acquires a responsibility over the broader realm of which one is a member. And so, for example, an individual journalist or geneticist may behave in an ethical manner; but if her peers are failing to do so, the senior worker should assume responsibility for the health of the domain. I denote such individuals as trustees: veterans who are widely respected, deemed to be disinterested, and dedicated to the health of the domain. As the French playwright Jean-Baptiste Molière commented, "we are responsible not only for what we do but for what we do not do."

Tensions Between and Among These Minds

Of the five minds, the ones most likely to be confused with one another are the respectful mind and the ethical mind. In part, this is because of ordinary language: we consider respect and ethics to be virtues, and we assume that one cannot have one without the other. Moreover, very often they are correlated; persons who are ethical are also respectful, and vice versa.

However, as indicated, I see these as developmentally discrete accomplishments. One can be respectful from early childhood, even without having a deep understanding of the reasons for respect. In contrast, ethical conceptions and behaviors presuppose an abstract, self-conscious attitude: a capacity to step away from the details of daily life and to think of oneself as a worker or as a citizen.

Some examples may be helpful. Even as a youth, Abraham Lincoln never liked slavery, and wanted to treat slaves as human beings with their own

aspirations, not as mere property. Yet it took him many years to become a political opponent of slavery. That is because as a citizen and as a political figure, he felt that it was his ethical obligation to obey the law: and the law protected slavery in much of the United States. As he put it, his own personal views—his own respect for Negroes—was irrelevant to his official role.

Only after much soul-searching, and many tumultuous political events, did Lincoln re-conceptualize his role as a political leader, and begin to favor emancipation. In this particular case, he brought into closer alignment his respectful and ethical minds.

Another example concerns whistle blowers. Many individuals observe wrongdoing at high levels in their company and remain silent. They may want to keep their jobs, but they also want to respect their leaders. It takes both courage and a mental leap to think of oneself not as an acquaintance—or even a friend—of one's supervisor but rather as a member of an institution or profession, with certain obligations attendant thereto. The whistle blower assumes an ethical stance, at the cost of a respectful relation to his supervisor.

Economist Albert O. Hirschman (1970) has written insightfully about such a sequence. Initially, he contends, one owes allegiance, or loyalty, to one's organization; this is a matter of respect. If, however, the offending situation remains or magnifies, then one has an obligation so speak up. At this point, voice trumps respect. Ultimately, if such an effort to alert and to change the organization is judged to be futile, then one should exit the organization: that is the only ethical course. Needless to say, such a sequence is difficult to realize in a totalitarian society, where other options are few and the penalties for voice can be severe.

Sometimes, respect may trump ethics. Initially, I believed that the French government was correct in banning Muslim women from wearing scarves at school. By the same token, I defended the right of Danish newspapers to publish cartoons that poked fun at Islamic fundamentalism. In both cases, I was taking the American Bill of Rights at face value—no state religion, guaranteed freedom of expression. But I eventually came to the conclusion that this ethical stance needed to be weighed against the costs of disrespecting the sincere and strongly held religious beliefs of others. The costs of honoring the Islamic preferences emerged as less than the costs of honoring an abstract principle. Of course, I make no claim that I did the right thing—only that the tension between respect and ethics can be resolved in contrasting ways.

Another example: the creative mind often finds itself in conflict with other minds. In East Asia, one is supposed to respect one's mentor throughout life. This stance is difficult to maintain when one engages in creative iconoclasm—more bluntly, when one's own work overthrows that of the mentor or, equally devastating, renders it irrelevant. For this reason, many aspiring creators from East Asia, move to the West, so that they do not appear to disrespect their teacher or mentor. By the same token, too much of an emphasis on discipline, or too much of a dedication to synthesis, also clashes with pursuit of creative breakthroughs. Some discipline and some synthesizing are necessary; but not too much.

Integrating Five Minds into One Person

Even if one believes that all five of these minds ought to be cultivated, many questions remain about how best to accomplish this goal. One could, for example, randomly assign young persons to one of five classrooms or schools; or, more deliberately, one could attempt to assess "mental affinities", and then place each child in the most congenial track (Johnny seems like he has a lot of potential to synthesize; let's put him in track #2). I do not favor this alternative, because I feel individuals will be better served if they have the opportunity to cultivate all five minds even if, in the end, some will emerge as stronger in one variety, while others exhibit a contrasting profile.

There is no strict hierarchy among the minds, such

that one should be cultivated before the others. Yet a certain rhythm does exist. One needs a certain amount of discipline—in both senses of the term—before one can undertake a reasonable synthesis; and if the synthesis involves more than one discipline, then each of the constituent disciplines needs to be cultivated. By the same token, any genuinely creative activity presupposes a certain disciplined mastery. And while prowess at synthesizing may be unnecessary, nearly all creative breakthroughs—whether in the arts, politics, scholarship or corporate life—are to some extent dependent on provisional syntheses. Still, as argued above, too much discipline clashes with creativity; and those who excel at syntheses are less likely to affect the most radical creative breakthroughs.

Without question, the respectful mind can be cultivated well before an ethical stance is conceivable. Indeed, respect ought to be part of the atmosphere from the earliest moments of life. When it comes to the cultivation of creativity, it is important to underscore personality and temperament factors. I believe that the building of a robust temperament, and a personality that is not afraid of reasonable risks—cognitive as well as physical—can begin early in life; these dispositions mark the future creator.

Whatever details of ordering may obtain, in the end it is desirable for each person to have achieved aspects of all five mental capacities, all five minds for the future. Such a personal integration is most likely to occur if individuals are raised in environments were all five kinds of minds are exhibited and all kinds of minds are valued. So much the better, if there are role models—parents, teacher, masters, supervisors—who on a regular basis display aspects of discipline, synthesis, creation, respect, and ethics. In addition to embodying these kinds of minds, the best educators at school or work can provide support, advice, coaching which will help to inculcate discipline, encourage synthesis, prod creativity, foster respect, and encourage an ethical stance.

In the end, however, no one can compel the cultivation and integration of the five minds. The individual human being must come to believe that the minds are important, merit the investment of significant amounts of time and resources, and are worthy of continuing nurturance even when external supports have faded. The individual must reflect on the role of each of these minds at work, in a favored avocation, at home, in the community, and in the wider world. The individual must be aware that sometimes these minds will find themselves in tension with one another, and that any resolution will be purchased at some cost. In the future, the form of mind that is likely to be at greatest premium is the synthesizing mind. And so it is perhaps fitting that the melding of the minds within an individual's skin is the ultimate challenge of personal synthesis.\

About Howard Gardner

Howard Gardner is the Hobbs Professor of Cognition and Education at the Harvard Graduate School of Education. He is the author of many books in psychology, education, and policy, including, most recently, Five Minds for the Future, Changing Minds, Good Work, The Development and Education of the Mind.

References

Gardner, H. (2006) Multiple intelligences: New horizons. New York: Basic Books.

Gardner, H. (2007) Five minds for the future. Boston: Harvard Business School Press.

Gardner, H., Csikszentmihalyi, M. and Damon, D. (2001) Good work: When excellence and ethics meet. New York: Basic Books.

Hirschman, A.O. (1970) Exit, voice and loyalty. Cambridge: Harvard University Press.