For the Success of Each Learner

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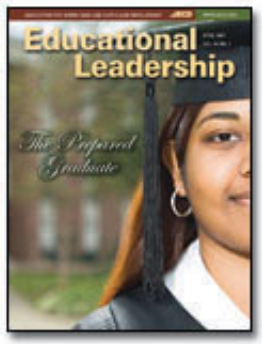
The Essential Cognitive Backpack

Mel Levine

What essential thinking skills and habits must students carry with them on their journey to successful adulthood?



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Many high school graduates look back on their secondary school journey with disappointment, believing that they were not adequately prepared for college or for work. In a recent poll, approximately 40 percent of recent graduates reported key gaps in their preparation. An overwhelming majority noted that if they could do high school over again, they would work harder and take more challenging courses (Peter D. Hart Research Associates/Public Opinion Strategies, 2005).

To avoid putting so many young people in this disheartening situation, high schools need to design a comprehensive program that strengthens not only traditional academic and technological competencies, but also the equally important attributes of a successful adult that U.S. schools often overlook. The presence or absence of these attributes—sometimes referred to as "the soft skills"—affects all start-up adults as they advance (or perhaps decline) through college and into the early phases of their careers. The gear can be sorted into what I have called the four *I*'s of young adult mind-work (Levine, 2005): *interpretation, instrumentation, interaction*, and *inner direction* (see "Cognitive Backpack Gear"). The following discussion highlights some of the most indispensable gear that ought to find its way into every graduate's cognitive backpack.

Interpretation

Sally was a diligent, determined honor student at her suburban high school. She applied her sharply focused mind to attain consistently praiseworthy results on examinations, and she was awesome in her precise recall of scientific facts, important dates in history, and mathematical processes. The reports that she wrote for various subjects were usually compilations of tightly organized snippets of information that she had found on the Internet and repackaged.

But now that she is a freshman at a leading state university, Sally's academic performance is in a state of alarming decline. She recently received a C- on an English test that required her to discuss the different ways in which Robert Frost uses irony and metaphor. Sally also feels anxious and confused in Philosophy 101 because she can't fathom such concepts as existentialism, Platonism, and logical positivism.

Back in high school, Sally succeeded by deploying her outstanding rote memory. She came to equate learning with memorizing. She never needed to grapple with such concepts as irony and the "isms." She is now thinking of taking a year off to travel in Eastern Europe with her friend.

She desperately wants to flee the frustration stemming from a cognitive backpack holding insufficient interpretive gear.

In-Depth Understanding

Many students struggle in college because they have trouble decrypting the content in courses like Physical Chemistry, Renaissance Poetry, and Political Theory. In high school, they were able to excel through efficient memorization and procedural mimicry, and they lack the tools needed for true comprehension.

To avoid this problem, high school classes in many different subject areas should groom students to become indepth analysts and interpreters. For example, social studies classes should give students opportunities to compare and contrast such concepts as *liberalism* and *conservatism*. In science class, the teacher might require students to establish and defend their personal point of view about government support for stem cell research. Learners should also be required to relate relevant prior knowledge to present learning and recognize recurring patterns. For example, in art class, students might examine a painting and discuss the patterns that suggest what century it was created in and who the artist was.

Students also benefit from discovering their preferred routes to comprehension. Some understand best verbally; others thrive on graphic representation; still others gravitate toward hands-on, experiential learning. In all instances, we should encourage them to represent information richly in their minds and, if possible, in multiple modalities (by thinking of examples, using mental imagery, rewording and elaborating, and so on).

Finally, students must understand whether they understand. So they should cultivate the habit of comprehension monitoring (Do I really get this? If not, where is my breakdown in understanding occurring?).

Evaluative (Critical) Thinking

Early adulthood presents a multitude of quandaries and challenges that cry out for evaluative thinking. High school graduates should be adept at evaluating issues (such as the pros and cons of granting citizenship to illegal aliens); products (such as those touted in TV commercials); new ideas; and people. In addition, young adults urgently need the ability to evaluate opportunities (for example, in considering job offers, choosing a graduate school, or deciding whether to stay out late partying the night before an important job interview).

To help students develop this capacity, high schools should engage them in carefully thought-out evaluative processes that push them beyond any uninformed biases. Moral and political dilemmas and everyday-life case studies should be used to model balanced evaluative thinking. In social studies class, students might be asked to evaluate a political speech to sort out its hard facts; its possibly hollow promises (formulated just to win votes); its assumptions; its contradictions; and the doctrines (for example, isolationism, fundamentalism, or socialism) on which it is based.

Mental Engagement

Incoming information rings bells in the mind of an engaged learner. New data or insights reverberate with previously registered knowledge and experience, often eliciting strong personal reactions. A vibrant mind vibrates. While reading or listening, it engages in active dialogue, mentally jousting with the author or speaker.

In contrast, many students emerge from high school as passive processors who simply sop up intellectual input without active response. Some passive learners, although able to scrape by academically, endure chronic boredom in school and later suffer career ennui. Their habit of cognitive inactivity can lead to mediocre performance in college and later on the job.

High schools should aggressively stuff the curriculum with questions that encourage students to

activate their thinking. We should ask students on a regular basis, What does this remind you of or connect to? How does this new information compare or contrast with what you learned in the past?

At the very least, every student should experience active mental engagement in a particular, individually chosen domain. One student may become intrinsically motivated to learn Arabic; another may be fascinated by opera; another may yearn to gain greater knowledge about organic chemistry. When I was an undergraduate, Barry Marks, an English professor, told us that "The most important book you'll read in this class is the one you pick up two weeks after the final exam!"

Students in high school should be on constant alert to identify the subjects that ignite their most dynamic thought processes and that they are likely to revisit independently. And educators should urge every student to find and cultivate personal content affinities, even if these topics fall outside the school curriculum. Kids learn to think richly by delving into one or more topics that resonate with their individual kind of mind. Active thinking is habit forming, so such ignited thought processes can start in one area of affinity and spread to formal curricular domains.

Instrumentation

Jackson is a highly creative and likable junior at a small college in New England. A combined art and music major, he is admired for his unique metal sculptures and for his acoustic guitar gigs at a local café. Yet Jackson has exasperated every faculty member who has come into contact with him. This disarmingly affable undergraduate consistently fails to hand in assignments and chronically arrives late to classes, apparently unaware that he has missed half of a lecture. He is spinning his wheels, wasting enormous amounts of time pursuing nonproductive activities such as playing video games, watching DVDs, and instant messaging his old high school buddies. Meanwhile, he is perilously far behind in art projects and has not been practicing his guitar. His academic work is often shoddy or incomplete; he claims that he doesn't have enough time to do a good job. Jackson's college career has been thwarted repeatedly by his inability to manage time and his lack of a sense of priorities, two vital instruments absent from his cognitive backpack.

Methodological Thinking

Productivity in adulthood increasingly takes the form of projects. Developing a proposal to sell and install the air conditioning in a new office building, assembling a business plan, compiling an updated middle school science curriculum, writing a screenplay, or conducting a medical drug trial—these are examples of projects that can make or break an individual ascending a career staircase.

We should infuse a project mentality into the minds of all high school students. Across subject areas, they should have abundant experience brainstorming (both as soloists and as collaborators) and developing plans that include time lines, staged steps, documentations of work in progress, and a range of additional project-specific ingredients. Such sustained, goal-directed, monitored activities demand the coordination of multiple elements to accomplish a significant long-term aim. These projects should stress effective time management and the ability to prioritize, to know which activities are most likely to have the highest yield.

Some students are born methodologists. Before tackling a task they ask themselves, "What's the best way to do this?" and go on to execute their tactics like a decorated Marine colonel on the field of battle. Sadly, many others just plunge in and do the first thing that comes to mind. As a result, they tend to do things the hard way, lack efficiency and organization, and sacrifice quality —all significant liabilities when it comes to handling an onerous undergraduate workload or demonstrating high productivity on the job.

High school education should stress methods as much as, if not more than, results. Students

should submit strategic plans for meeting their major challenges, such as how they intend to prepare for their final exam in biology or for an upcoming dance recital. They should be graded on their proposed tactics.

Working Capacity

Our culture places a tremendous emphasis on immersing young people in activities that are fun. Kids nowadays tend to judge even their education experiences (and often their teachers) in terms of whether they are fun, as opposed to interesting. Many students fail to build up their mental working capacities and so lack the cognitive stamina and motivation to pursue important activities that are not instantaneously entertaining. Similarly, many contemporary young adults want to start at the top in their careers because they have not acquired the working capacity needed to labor through a gradual ascent to leadership. Such prolonged toil calls for the delay of gratification and the realization that your boss (unlike your mom) doesn't much care if you're having fun. Nor is she or he lying awake at night worrying about your self-esteem.

Much of the responsibility for building working capacities has to reside at home, where parents should establish consistent times for homework, assign household chores, reward or praise children for productive effort rather than grades, encourage children to persist when the going gets tough, and so on. Schools, however, can also help strengthen working capacities—for example, by making mental discipline a part of extracurricular endeavors such as athletics, clubs, and the arts.

Interaction

Rick was a widely respected member of his high school class, a student leader with an impressive flock of friends. His dad once described him as "the ultimate people person." He was great at collaborating on projects, and he was the guy his friends could confide in when they were foundering under the weight of personal problems. He was elected president of the student council his senior year, having delivered some impressive campaign speeches.

Despite his popularity and obvious social skills, Rick was also a rugged individualist who maintained interests that were unfashionable and not at all "cool" by his peers' standards. He played the viola, listened to opera and baroque music, and loved to garden and go birdwatching by himself. Rick was remarkable in his ability to relate well to his peers without compromising his individuality and autonomy. His interaction equipment, stashed in his cognitive backpack, was exquisitely calibrated for leadership.

Unlike Rick, too many teenagers get mesmerized by the social scene and bow to implacable conformity as a means of gaining acceptance. They may leave high school intoxicated with the triumphantly flattering relationships they have forged with peers of both genders. They cherish these intense affiliations, valuing them over everything else in their lives.

In college and in the workplace, an obsessive interest in adolescent-type relationships may undermine career trajectories if this relationship style is not transformed into less intimate, more meaningful workplace collaboration. Young adults must balance the desire for acceptance, and the resultant behaviors and values used to ingratiate or market oneself to peers, with the mission of developing as an individual with distinctive interests, competitive advantages, and personal aspirations.

On the other end of the spectrum, some students falter repeatedly when it comes to social cognition. The interpersonal side of their lives engenders agony, humiliation, or crippling insensitivity to others. Such people are at risk for early adult failure because they have trouble collaborating; difficulty relating to supervisors (including college faculty); and problems diagnosing the needs and desires of those they serve (such as bosses and customers).

Students should have opportunities to study and discuss the social side of life throughout the school years. For example, schools might offer a course on adult life that includes consideration

of the temptations and hazards of social relationships as well as the kinds of relationships worthy of cultivation during college and adulthood.

Inner Direction

From the age of 10, Rosina could tell you where she was headed in life. She knew that she wanted to help people, especially little children. As she went through middle and high school, it became apparent to her that she did not have the kind of mind likely to excel in math or science, although she loved and thrived in English and history classes. During high school, she worked two summers teaching handicapped children to ride horses.

By the time she got to college, Rosina knew that she wanted to be a special educator and do something "really important." Her goal was to start her own high school for kids with learning problems. She majored in education, taught for a few years after college graduation, and then got a master's degree in business to prepare for running a school. Nothing could thwart her as she pursued her goals. Her inner direction was remarkable.

"Know Thyself"

Whether start-up adults are choosing a college major or charting a career course (or both), their decisions should be informed by insights into their own strengths, weaknesses, and affinities. We must help them look backward and forward, review their recurring autobiographical themes, and uncover the consistent assets and proclivities that could blossom into fulfillment for them. A student might reflect, "I've always been at my best when I'm working outdoors." Or "I have to be working to help others; that's how I have found gratification." Or "I'm very hands-on; my brain works best when I'm building or fixing or creating something with my hands."

Schools should help students pose the right questions about themselves. Throughout their education, children and adolescents should be working on their autobiographies, sifting through earlier pages and pondering implications for the next several chapters.

Career Orientation

Many students graduate from high school in a state of infantile naïveté when it comes to the real world of work. All schools should stress career education, exposing students to the realities of careers, the rewards and the impasses, and the roller-coaster rides pervading every work life. Too many competent start-up adults are blind-sided at age 23 or 24 because they were never prepared to anticipate the true demands of the vocations they were considering. Does that avid scuba diver realize that marine biology calls for hefty mathematical thinking? Does that lover of English poetry know that being an English professor means writing grants? Does that articulate future trial attorney realize that rising to the vaulted status of a judge or a senior partner will entail hundreds of late nights grinding out research on state regulations and previous judicial decisions?

Career education can also enable students to foresee possibilities for themselves that they may not have been able to envision on their own. The student who loves traveling and is swift at language acquisition might learn about such career options as joining the Foreign Service or entering the field of international business, travel, or public health.

On the Road to Success

The gear contained in our proposed cognitive backpack is consistent with research findings. A report addressing the knowledge and skills employers identify as crucial to success in the workplace states that "applied skills dominate the rankings of knowledge and skills expected to increase in importance over the next five years" (Casner-Lotto & Barrington, 2006, p. 49). These include, in rank order, (1) critical thinking/problem solving, (2) information technology application, (3) teamwork/collaboration, (4) creativity/innovation, (5) diversity, and (6) leadership. Knowledge domains—foreign languages, mathematics, writing, reading

comprehension, and science—were ranked numbers 12 through 16.

Through a deliberate focus on *interpretation, instrumentation, interaction*, and *inner direction*, schools can pack every graduate's cognitive backpack with the right gear, so that start-up adults are well matched to their chosen pursuits and well rehearsed for constructive work lives. By equipping these backpacks appropriately, we will enhance the odds that our students will be ready for their career journeys—skillfully deploying their insights, their strengths, their values, and their affinities as they stay on course for self-realization.

Cognitive Backpack Gear

Interpretation (*becoming an in-depth comprehender*)

- Forming, grasping, and applying concepts
- Accessing and using prior knowledge and experience
- Understanding through verbal, nonverbal, and experiential pathways
- Forming multiple vivid mental representations of new knowledge and ideas
- Monitoring degrees of comprehension
- Analyzing expectations (overt as well as unspoken)
- Systematically evaluating ideas, issues, people, and products
- Assessing opportunities
- Actively processing information inputs
- Balancing or integrating detail with the "big picture"
- Finding a balance between "top-down" and convergent thinking

Instrumentation (*acquiring a project mentality*)

- Brainstorming
- Thinking long-term and previewing potential outcomes
- Applying step-by-step thinking (instead of snap decisions or impulsive approaches)
- Achieving task integration
- Learning, developing, and applying strategies
- Managing time and prioritizing
- Overcoming an obsession with "fun"
- Harnessing mental energy and effort
- Postponing "payoffs"; working one's way up
- Developing effective personal work patterns

Interaction (*building and sustaining productive, fulfilling relationships*)

- Succeeding interpersonally without social addiction
- Collaborating

- Resisting/preventing affiliation dependency
- Forging working relationships (as opposed to adolescent-type friendships)
- Communicating effectively (verbal pragmatics)
- Relating to more senior people (such as bosses)

Inner Direction (*attaining malleable self-insights that inform self-launching*)

- Knowing one's current profile of strengths and weaknesses
- Aligning that profile with (preliminary/tentative) life plans
- Reviewing autobiographical *leitmotifs*
- Deciding on personal job values
- Finding pockets of intrinsic motivation/passions
- Discovering and cultivating affinities
- Uncovering competitive advantage(s)
- Previewing potential life roles
- Probing what it will take to succeed

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Author's note: Mary-Dean Barringer, Barbara Levine, and Melissa Wakely contributed to this article.

Mel Levine, MD, is Professor of Pediatrics at the University of North Carolina Medical School and Cofounder of All Kinds of Minds, 1450 Raleigh Rd., Ste 100, Chapel Hill, NC 27517; 919-966-1020; mail@allkindsofminds.org. For more information about Dr. Levine's work and the nonprofit institute he codirects, see http://allkindsofminds.org.