This passage from Denk’s essay captures the essence of creative work: intersecting currents of thought; problem solving marked by both urgency and reflection; and exploration that is focused but also meanders and allows for serendipity and unexpected associations and insights. Moreover, Denk demonstrates the power of analogical reasoning to solve creative problems when he uses the image of the river to rethink how he will play the Ives Piano Trio. To continue the metaphor, to what extent do our universities and colleges resemble the Connecticut River—creative, dynamic sites that advance the wide, expansive of human knowledge and culture, while allowing for a million intersecting currents and meandering multiplicity? In this essay, I explore the relationship between higher education and creativity. I argue that creativity should be at the heart of a university education, yet existing trends and institutional pressures often undermine its central role on our campuses. I contend that creativity is not a mysterious and magical quality that only a few possess. Rather, cognitive scientists, psychologists, and sociologists know a great deal about how to measure, stimulate, and support creative work. Importantly, while the arts do not have a monopoly on creativity, there is increasing evidence that certain types of artistic training and experiences build creative muscle and prepare us to innovate and invent in many areas of our lives.

The Creative Imperative

Over the past decade, economists, urban planners, sociologists, and journalists have been busy ringing the creativity bell—announcing to politicians, educators, business leaders and others that success in the twenty-first century requires a new approach to problem solving. This new approach is rooted in right-brain thinking that favors storytelling, empathetic reasoning, and aesthetic sophistication: It requires tolerating ambiguity and embracing complexity; thinking laterally; working across disciplines and fields of expertise; and being tolerant and open minded. Many contend that we live in a postindustrial economy where intellectual property is valued more than physical assets like land, machines, and buildings. Others describe an enterprise economy where people are “living on thin air” and success requires inventing services and new forms of entertainment and media to satisfy needs not yet known or acknowledged. And, many of the most wicked and entrenched social, medical, and scientific problems—poverty, school reform, global warming, obesity, malaria, Alzheimer’s disease—require interdisciplinary creative teams working together to find nonroutine solutions.

Richard Florida has perhaps done more than anyone to get the attention of policy makers and to make creativity a central tenet of urban economic growth strategies. His best-selling book, The Rise of the Creative Class, champions the rapidly growing slice of the American workforce that includes designers, software engineers, writers, animators, musicians, and others who are primarily working in industries that produce intellectual property. Florida argues that the most successful twenty-first-century cities will be

Creativity is essential for our macro economy, but it is also critical for individual health and well-being. Our global economy, while creating expanded opportunity for many, also produces increased anxiety and stress related to job insecurity, global migration, demographic change, market instability, and decreased public services. Fewer people can aspire to a secure, long-term career. In fact, according to the U.S. Bureau of Labor Statistics in 2010, men and women 18 to 44 years old held on average 11 jobs in their lifetime. A 2003 General Social Survey found that 75 percent of recent college graduates indicated that location was more important than the availability of a job when deciding where to go after graduation. Such instability and contingency have major consequences on feelings of well-being. In a recent public opinion survey, 93 percent of respondents were worried that “things were changing too fast for me.” In my argument, and the argument of others, is that the ability to act and think creatively is necessary to navigate such uncertain seas and to give citizens the confidence and efficacy necessary to deal with ambiguity and contingency. In fact, Ruth Richards finds that creative people are often more resilient and less anxious about change and trauma. They are more likely to feel a greater sense of control over their lives and, remarkably, to see marked improvements in psychological and physical health. Paul H. Ray and Sherry Ruth Anderson estimate that some 30 million American adults are “cultural creatives” who are particularly adaptable to new social and environmental conditions—constantly searching for innovative, sustainable ways to live and organize their households and communities. 72 Skillful others have found that creative people are more likely to be open to and accept change: that they fall back on nostalgia, hate, or cynicism, creative people imagine a better future and deploy their talents to secure that future for themselves, their families, and others.

Fortunately, young people today recognize and value creativity in their lives and seek education and careers that allow them to nurture and express this capacity. To the extent that many associate creativity with the arts, we should be reassured that a recent survey of teenagers revealed that the arts are among their most popular future career interests. Seventeen percent of teens chose art or medicine compared to 14 percent who chose engineering, 9 percent who chose science, and 8 percent who chose business. These interest trends have yielded a 20 percent increase in demand for arts degrees at the collegiate level—1998. In 2008, colleges and universities graduated 75,000 visual and performing arts majors; in 2012, that number rose to 129,000, more than a 70 percent increase. Beyond the arts, college students more generally express a commitment to a creative education and life. In a recent survey, 84 percent of college students say that thinking creatively is an important college skill. Among the students who plan to work in creative careers, 92 percent say that they are creative people who thrive—to foster places that are open, tolerant, diverse, and adaptable to change; rather than falling back on nostalgia, hate, or cynicism, creative people imagine a better future and deploy their talents to secure that future for themselves, their families, and others.

Beyond the arts, college students now express greater confidence and efficacy in their ability to think creatively. In a recent survey, 84 percent of college students say that thinking creatively is an important college skill. Among the students who plan to work in creative careers, 92 percent say that they are creative people who thrive—to foster places that are open, tolerant, diverse, and adaptable to change; rather than falling back on nostalgia, hate, or cynicism, creative people imagine a better future and deploy their talents to secure that future for themselves, their families, and others.

Our values are evident in the way we pitch our campuses to prospective students. Whenever I have a chance, I drift behind admissions tours at my university and listen to the pitch: “These in- credible programs are part of this great ‘lifestyle’ package. If knowledge transfer is the mandate for collaborative teaching and research across disciplinary lines; and, for the most part, we have failed to make our classrooms sites of experimentation and creative engagement with real world problems. Our values are evident in the way we pitch our campuses to prospective students. Whenever I have a chance, I drift behind admissions tours at my university and listen to the pitch: “These incredible programs are part of this great ‘lifestyle’ package. If knowledge transfer is the mandate for collaborative teaching and research across disciplinary lines; and, for the most part, we have failed to make our classrooms sites of experimentation and creative engagement with real world problems.

In short, creative people are resilient and adaptable to change; rather than falling back on nostalgia, hate, or cynicism, creative people imagine a better future and deploy their talents to secure that future for themselves, their families, and others.

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that over the past decade more than 100 traditional four-year campuses closed, and the number of cor-
porate and online universities has grown by more
than ten times. Moreover, these educational institu-
tions—efficient and profitable as they may be—are not well suited to producing creative, resilient prob-
lem solvers who can make connections across do-
 mains of knowledge, incorporate critical feedback,
radically revise their work, and embrace the ambigu-
ity and messiness of complex puzzles.

More evidence from the social sciences supports the conclusion that the industrial model of education, with its emphasis on the efficient accumulation of
knowledge and standardized testing, discourages creative thinking. Sohee Park, a psychologist at
Vanderbilt, studies creativity and cognition. She
notes that students who do very well on standardized
tests have a great ability to focus intently and to
screen out any “disturbing information” or “remote
associations.” As a result, they typically score much
lower on a range of creativity tests. On the other hand,
students whose brains are “messier,” less efficient,
and more prone to distraction can typically come up
with much more creative ideas. Here is a wonderful
example of the difference between two undergradu-
ates—the first subject was highly focused and likely a
good test taker; the second tended to allow “disturct-
ating” information to enter into his thinking. When
faced with a set of images—toothbrush, toothpaste,
flour, for example—both subjects were asked to gen-
erate “uses” for the objects. The first subject (let’s say
the likely high SAT subject), wrote, “I would use the
toothpaste on my toothbrush and then use the floss
to clean my teeth every night.” The second subject
wrote, “I am romantic but I am broke. I will take my
girlfriend to the beach and I’ll use the toothbrush
to write ‘I love you’ on the sand and make an engage-
ment ring with the floss, I will squeeze the toothpaste
on the floss and dry it to make it look like a pearl so
she can have a pearl ring.” Would you want to live in
a world that focuses exclusively on rewarding and se-
lecting the first type of thinker? If we care about cre-
ativity across the spectrum, we need to stop orienting
educational rewards around the first type of thinker
at the exclusion of the second.

Training in Creativity and the Role of the Arts

The first step then is for universities to embrace cre-
ativity as a critical learning outcome. While creativity
can mean many things, a useful starting point is to
think of a creative person as someone who draws on
nonroutine approaches to solve problems, successful-
ly communicates the value of their approach to others,
and mobilizes resources to realize their idea in an ap-
propriate form. But, if we are to make creativity a core
learning objective, then we need a way to measure
what has traditionally been viewed as mysterious and
illusive. In fact, many extraordinarily creative people
attribute their insights to epiphanies, unconscious
thought, and deep drives and passions that are diffi-
cult to articulate. Nonetheless, over 40 years of re-
search in psychology and cognitive science has yield-
ed a variety of valid ways to measure and assess
creativity. For example, the psychologist Robert J.
Sternberg has developed a creativity test that uses
analogies, open-ended stories and pictures, and diver-
gent-thinking tests to measure creativity. It turns out
that knowing whether an incoming student is creative
on Sternberg’s measures is a more-reliable predictor
of freshman academic success than are more-tradi-
tional measures like the SAT or high school GPA. But,
even if we can measure creativity with some pre-
cision, perhaps it is a product of personality or indi-
vidual psychology and not something that can be
learned or taught. Again, social science research
suggests this is not the case. Creativity involves a set
of teachable competencies, which include idea gener-
ation, improvisation, metaphorical and analogical
reasoning, divergent thinking that explores many
possible solutions, counterfactual reasoning, and
synthesis of solving competitions. Creativity also re-
quires an ability to communicate and persuade, and
the skills and leadership to bring together diverse and
specialized expertise. Rex Jung, a neuroscientist
from the University of New Mexico, concludes that
these competencies can be purposefully nurtured.

Those who diligently practice creative activities
learn to recruit their brains’ creative networks quicker
and better.” In his recent study of schools of art and
design, the creativity scholar Keith Sawyer concludes
that the “studio model” is a proven method for teach-
ing creativity. The model involves project-based cur-
ricula where students, guided and coached by in-
structors, work through complex and authentic
problems that require making and presenting visible
artifacts to an external audience. He argues such
thinking is “best thought of as an improvisational ac-
tivity, and that the best teaching is disciplined impro-
visation: teaching that provides space for the flexibili-
ty required for constructivist learning, but guided
within structures and frameworks—in a similar fash-
ion to professionally performed improvisations
found in jazz and improv theater.”

Research in cognition and brain science further sug-
gests that the arts play a special role in fostering cre-
ative inquiry. David Perkins, a cognitive psychologist,
had found that creative people rely on a tool kit of ana-
lytical and cognitive strategies and “thinking disposi-
tions” for solving puzzles. Art can be a powerful tool
in this kit. In particular, Perkins finds that looking at
visual art helps build “reflective intelligence”—a set
of habits and dispositions that allow us to avoid snap
judgments, see patterns, make connections, and
double check your work. He notes that the “studio
model” is an appropriate form. But, if we are to make creativity a core
skill—reporting that they are much more likely to
learn to recruit their brains’ creative networks quicker
and better.” For example, 53 percent of arts majors
say that beauty and the arts enhance their effort and
motivation to do their studies.”

And while the arts do not have a monopoly on teach-
ing creativity, recent evidence from a national study
conducted by the Curb Center at Vanderbilt Universi-
ty, with Teagle Foundation support, found that arts
majors integrate and use core creative abilities more
often and more completely than students in almost all
most other fields of study. For example, 53 per-
cent of arts majors say that beauty and the arts enhance their effort and
motivation to do their studies.”

Moreover, arts graduates say their education helped
them become more creative even outside of an artistic
career. According to a national survey of more than
35,000 arts graduates, even those who are working in
non-art occupations, say they learned important cre-
ative skills in school that they use in their jobs. For
example, among arts graduates who ended up as
managers, software developers, or social-service
workers—two of the least likely to engage in creative work—say that they learned important
skills in their jobs; of those, more than four-
fifths say their arts training provided a lot or quite a bit
of training in creativity.

The arts are not grace notes on our campuses. They
should not be viewed as one of many amenities and
lifestyle options that “students/consumers” can
choose among when they arrive on campus. Social
and cognitive science has demonstrated a strong link
between artistic expression and creative thinking.
Not all arts engagement enhances creativity (practic-
sing a Dvorak piano quintet 100 times is not necessar-
ily the route to invention and nonroutine insights).
But “disciplined improvisation”—the essence of learning to create something original within the parameters of existing convention—is a foundation for creative inquiry more broadly and a cornerstone of artistic practice.

It is time for a sea (“C”) change in higher education—one that places creative inquiry at the heart of campus life. Last week when strolling through the main hall of a prominent building on campus, I looked toward the window of the three-story atrium and read these words etched above a double stone arch: “The Brain is wider than the Sky—”. When Emily Dickinson wrote these words, she was not considering the evidence from cognitive science, psychology, and sociology—that the adult brain would prefer to reside within the comfort of a familiar blue sky than risk the chaos of the unknown. Our institutions are willing accomplices in the brain’s escape from uncertainty—emphasizing control rather than surprise, metrics rather than meaning, achievement over inquiry, and outcomes over process. We need a radically new approach; one that might benefit from what the arts have to offer. As the distinguished education scholar Elliot Eisner notes, “The arts teach students to act and to judge in the absence of rule, to rely on feel, to pay attention to nuance, to act and appraise the consequences of one’s choices, and to revise and then to make other choices.” In short, echoing the evidence presented in this essay, Eisner suggests that the arts might expose students to the realities of a complex and creative world far better than “the tidy right-angled boxes” we employ daily in our classrooms.

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