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## Meandering Multiplicity: Envisioning a Twenty-First-Century Creative Campus

**IN A RECENT ARTICLE IN THE NEW YORKER MAGAZINE** pianist Jeremy Denk recounts a summer at music camp at Mount Holyoke College, where he was struggling to learn a particularly difficult segment of Charles Ives's demanding Piano Trio. His breakthrough came when he and friends drove a few miles off campus to the Connecticut River. He writes, "From the bridge the river seemed impossibly wide, and instead of a single current there seemed to be a million intersecting currents—urgent and lazy rivers within the river, magical pockets of no motion at all. The late-afternoon light colored the water pink and orange and gold. It was the most beautiful, patient, meandering multiplicity. Instantly, I knew how to play the passage."<sup>1</sup>

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, expanse 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.<sup>2</sup> 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.<sup>3</sup> 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.<sup>4</sup>

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

<sup>1</sup> Jeremy Denk, "Flight of the Concord: The Perils of the Recording Studio," *New Yorker*, February 6, 2012, 25.

<sup>2</sup> See Daniel Bell, *The Coming of Post-industrial Society: A Venture in Social Forecasting* (New York: Basic, 1976) and Richard Florida, *The Rise of the Creative Class* (New York: Basic, 2002).

<sup>3</sup> Charles Leadbeater, *Living on Thin Air: The New Economy* (London: Viking, 1999).

<sup>4</sup> Terry C. Pellmar and Leon Eisenberg, eds., *Bridging Disciplines in the Brain, Behavioral, and Clinical Sciences* (Washington, DC: National Academy, 2000).



those places that can attract and retain these creative class workers. Moreover, corporations and cities need to create the conditions that allow these workers to thrive—to foster places that are open, tolerant, diverse, stimulating, and artistically vital. Daniel Pink argues that the MFA is the new MBA—and that the skills learned in art and design schools may be the ones that are most needed to thrive in a twenty-first-century creative economy.<sup>5</sup> As a 2010 IBM poll of 1,500 CEOs revealed, “creativity” is thought to be the number one leadership competency of the future.

The creative economy is growing in part because of the “aestheticization of everyday life”<sup>6</sup>—we spend more time than ever before surrounded by and engaged with images, stories, sounds, and designs that are produced by artists. As John Howkins reminds us: “In 2001, the British, Americans and Japanese spent more on entertaining themselves than on clothing or health care.”<sup>7</sup> And, while health care costs continue to balloon, so too do the costs of media consumption. Based on current trends, future household spending on media consumption could easily exceed \$300 per month on average, buying individuals access to unlimited music, movies, television, games, mobile apps, and news. And, even beyond electronic media, trends clearly indicate that the demand for aesthetically compelling designs and experiences—from buying a toaster to choosing a restaurant—is growing. In fact, IKEA, the Swedish-based home furnishings mega-chain that emphasizes modern design, claims that one in ten British citizens are conceived in one of its beds,<sup>8</sup> and 7 million people visit one of its stores each Sunday, compared with the 4.5 million who go to church.<sup>9</sup>

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, and 25 percent held 15 or more jobs. A *Wall Street Journal* 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 live after graduation.<sup>10</sup> Such instability and contingency has 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 these days.”<sup>11</sup> 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.<sup>12</sup> 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 50 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.<sup>13</sup> Still others have found that creative people are more politically tolerant and more accepting of diverse people and ideas—a critical capacity given our global interconnectedness and rising levels of immigration.<sup>14</sup> 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.

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.<sup>15</sup> These interests have yielded a surge in demand for arts degrees at the collegiate level—in 1998, U.S. 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.<sup>16</sup> 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, compared to only 60 percent who say the ability to solve quantitative programs is important. And, looking past graduation, 92 percent say a career that allows them to be creative is important.<sup>17</sup>

### How Has Higher Education Responded?

Businesses demand creativity, students aspire to creative lives, and the world needs creative people to solve its most pressing needs. How have our schools and universities responded to the challenge? As I argued almost a decade ago in the pages of the *Chronicle of Higher Education*, few universities or colleges think strategically or purposefully about how to nurture and encourage creativity.<sup>18</sup> We pay lip service to interdisciplinarity while rewarding narrow expertise and scholarship; we promote broad general-education requirements without forcing students to make connections between diverse subject matter; we make it difficult for collaborative teaching and research across disciplines; 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 to listen to how guides are selling the Vanderbilt experience. They inevitably talk about the great athletic facilities, comfortable dorms, first-rate food, proximity to downtown Nashville, and the excellent service one gets from faculty because of small class sizes. In short, our universities are presented to pro-

spective students like another consumer good—chock full of amenities and choice. Often the on-campus arts are presented as part of this great “lifestyle” package. Given this consumerist mentality, it is not surprising that more than 25 percent of undergraduates report that they should get refunds for classes they don’t like.<sup>19</sup> This is not a culture that breeds creativity.

Not only do we ignore creativity as a potential selling point when recruiting students, we often fail to make creativity a priority in our classrooms. Consider these statistics from a national survey of seniors: 37 percent report that coursework rarely or never allows them to express their individual creativity; 67 percent report that classes are *not* intellectually playful; and 70 percent say they are generally *not allowed* to take assignments in different directions.<sup>20</sup> Part of this is because we still organize teaching, at the K–12 level and in most college settings, by a model designed to serve industrial needs at the turn of the twentieth century.<sup>21</sup> Even though our colleges often look more like cathedrals than factories, we operate on a model of mass production—a “batch of students” arrives, we process them through a series of highly structured, time-restricted production units (50-minute classes), we standardize the output through testing and assessment; we educate students through incremental assembly (sequencing courses to allow for a straightforward accumulation of knowledge), and, after four years, we release the batch into the world, hoping that we have transferred sufficient knowledge to allow them to find jobs and prosper. This doesn’t look much like Denk’s view of the Connecticut River—“a million intersecting currents, urgent and lazy, magical pockets, meandering multiplicity.”

In fact, I would argue that the face-to-face, four-year college experience is doomed if we continue to view education as a process of transferring information—pouring “valuable” knowledge into the raw and still-unformed student brain. If knowledge transfer is the goal of higher education, other models can do it cheaper and more efficiently. This might explain why the National Center for Education Statistics reports

5 Daniel H. Pink, *A Whole New Mind: Why Right-Brainers Will Rule the Future* (New York: Riverhead, 2006).

6 Mike Featherstone, *Consumer Culture and Postmodernism*. London: Sage Publications, 1991.

7 John Howkins, *The Creative Economy: How People Make Money from Ideas* (London: Penguin, 2001), xv.

8 Finlo Rohrer, “The Pleasure and Pain of Ikea,” *BBC News* [London], February 10, 2005.

9 John Edwards, “I’ve Got an Ikea! Let’s Skip Church.” *Daily Mail* [London], July 9, 2003.

10 Cited in Florida, *Rise of the Creative Class*.

11 From data collected by the author in 2010, from a random sample of 2,500 adults in North Carolina and Tennessee.

12 Ruth Richards, ed., *Everyday Creativity and New Views of Human Nature: Psychological, Social, and Spiritual Perspectives*, 1st ed. (Washington, DC: American Psychological Association, 2007).

13 Paul H. Ray and Sherry Ruth Anderson, *The Cultural Creatives: How 50 Million People Are Changing the World* (New York: Harmony, 2000).

14 Gidi Rubinstein, “Authoritarianism and its Relation to Creativity: A Comparative Study among Students of Design, Behavioral Sciences and Law,” *Personality and Individual Differences* 34, 4 (2003): 695–705.

15 “Survey Gauges Teens’ View of Tech Future.” *MIT News*, January 12, 2006. Accessed January 29, 2013.

16 <http://web.mit.edu/newsoffice/2006/lemelson-teens.html>.

17 Roland Kushner and Randy Cohen, *National Arts Index 2012: An Annual Measure of the Vitality of Arts and Culture in the United States: 1998–2010*. Accessed January 29, 2013, <http://www.artsindexusa.org/wp-content/themes/>

[AFTA%20for%20WP/doc/2012-NAI-Full-Report.pdf](http://www.artsindexusa.org/wp-content/themes/AFTA%20for%20WP/doc/2012-NAI-Full-Report.pdf).

18 From data collected by the author of a Teague Foundation-supported study, “Double Majors: Influences, Identities, and Impacts,” in 2012, from a sample of 1,736 across nine U.S. colleges and universities.

19 Steven J. Tepper, “The Creative Campus: Who’s No. 1?” *Chronicle of Higher Education*, October, 2004.

20 Ibid.

21 Ken Robinson and Peter Brinson, *The Arts in Schools: Principles, Practice and Provision* (London: Calouste Gulbenkian Foundation, 1982).



that over the past decade more than 100 traditional four-year colleges have closed, and the number of corporate and online universities has grown by more than ten times.<sup>22</sup> But, these new educational institutions—efficient and profitable as they may be—are *not* well suited to producing creative, resilient problem solvers who can make connections across domains of knowledge, incorporate critical feedback, radically revise their work, and embrace the ambiguity 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 “distracting information” or “remote associations.”<sup>23</sup> 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 undergraduates—the first subject was highly focused and likely a good test taker; the second tended to allow “distracting” information to enter into his thinking. When faced with a set of images—toothbrush, toothpaste, floss, for example—both subjects were asked to generate “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 engagement 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.”<sup>24</sup> Would you want to live in a world that focuses exclusively on rewarding and selecting the first type of thinker? If we care about creativity 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 creativity 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, successfully communicates the value of their approach to others, and mobilizes resources to realize their idea in an appropriate 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 difficult to articulate. Nonetheless, over 40 years of research in psychology and cognitive science has yielded 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 divergent-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-traditional measures like the SAT or high school GPA.<sup>25</sup>

But, even if we can measure creativity with some precision, perhaps it is a product of personality or individual psychology and not something that can be taught in a classroom. Again, social science research suggests this is not the case. Creativity involves a set of teachable competencies, which include idea generation, improvisation, metaphorical and analogical reasoning, divergent thinking that explores many possible solutions, counterfactual reasoning, and synthesis of competing solutions. Creativity also requires 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.”<sup>26</sup> 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 teaching creativity. The model involves project-based curricula where students, guided and coached by instructors, work through complex and authentic problems that require making and presenting visible artifacts to an external audience. He argues such teaching is “best thought of as an improvisational activity, and that the best teaching is *disciplined* improvisation: teaching that provides space for the flexibility required for constructivist learning, but guided within structures and frameworks—in a similar fashion to professionally performed improvisations found in jazz and improv theater.”<sup>27</sup>

Research in cognition and brain science further suggests that the arts play a special role in fostering creative inquiry. David Perkins, a cognitive psychologist, has found that creative people rely on a tool kit of analytical and cognitive strategies and “thinking dispositions” for solving puzzles. Art can be a powerful tool in the 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 deeply consider and evaluate the many small decisions made by an artist. In short, art builds “better thinking.”<sup>28</sup> Kevin Dunbar, a neuroscientist at the University of Toronto, has arrived at similar conclusions using brain scans. Initial research in his lab has found that participation in the performing arts activates areas of the brain that are critical for higher-order creative thinking—including analogical reasoning and abstract thinking.<sup>29</sup>

And while the arts do not have a monopoly on teaching creativity, recent evidence from a national study conducted by the Curb Center at Vanderbilt University, with Teagle Foundation support, found that arts

majors integrate and use core creative abilities more often and more consistently than do students in almost all other fields of study.<sup>30</sup> For example, 53 percent of arts majors say that ambiguity is a routine part of their coursework, as assignments can be taken in multiple directions. Only 9 percent of biology majors say that, 13 percent of economics and business majors, 10 percent of engineering majors, and 7 percent of physical-science majors. Four-fifths of artists say that expressing creativity is typically required in their courses, compared with only 3 percent of biology majors, 16 percent of economics and business majors, 13 percent of engineers, and 10 percent of physical-science majors. And arts majors show comparative advantages over other majors on additional creativity skills—reporting that they are much more likely to have to make connections across different courses and reading, more likely to deploy their curiosity and imagination, more likely to say their coursework provides multiple ways of looking at a problem, and more likely to say that courses require risk taking.

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 creative skills in school that they use in their jobs.<sup>31</sup> For example, among arts graduates who ended up as managers, software developers, or social-service workers, upward of 80 percent say that creativity is an important skill 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 (practicing a Dvorak piano quintet 100 times is not necessarily the route to invention and nonroutine insights).

22 National Center for Education Statistics. *Digest of Education Statistics* (Washington, DC: NCES, 2011).

23 Sohee Park. Personal interview with author, spring 2012.

24 Ibid.

25 Robert J. Sternberg, *College Admissions for the 21st Century* (Cambridge, MA: Harvard University Press, 2010).

26 Po Bronson and Ashley Merryman, “The Creativity Crisis,” *Newsweek*, July 10, 2010. Accessed January 29, 2013, <http://www.thedailybeast.com/newsweek/2010/07/10/the-creativity-crisis.html>.

27 R. Keith Sawyer, “Learning How to Create: Toward a Learning Sciences of Art and Design,” *The Future of Learning: Proceedings of the 10th*

*International Conference of the Learning Sciences* 1 (2012): 34.

28 Perkins, David N. *The Intelligent Eye: Learning to Think by Looking at Art* (Santa Monica, CA: Getty Center for Education in the Arts, 1994).

29 Kevin Niall Dunbar, “Arts Education, the Brain, and Language,” *Learning, Arts, and the Brain* (2008): 81.

30 “Double Majors: Influences, Identities, and Impacts” (see n. 17 above).

31 Strategic National Arts Alumni Project, *A Diverse Palette: What Arts Graduates Say About Their Education and Careers: 2011 Findings* (Bloomington: Indiana University Center for Postsecondary Research, 2012).



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.”<sup>32</sup> 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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<sup>32</sup> Elliot W. Eisner, *Reimagining Schools: The Selected Works of Elliot W. Eisner* (London: Routledge, 2005), 208.