

Why Redesign Curriculum?

Igor Pušenjaj, age thirty-four, was placed fourteenth on *Fast Company*'s 2010 list of the one hundred most creative people. He and his brother designed Doodle Jump, the most popular application for the iPhone. The brothers' \$100 investment, coupled with tenacity in the face of five previous failures, led to the game's selling more than four million copies by May 2010. On his Web site, Pušenjaj describes himself as a "photographer, multimedia artist, designer, technologist, pilot, and an avid sailor," a modern renaissance man. Pušenjaj's place on the *Fast Company* list points to the increasing importance of creativity and adaptability to changing work opportunities.

How does this story relate to curriculum design? Lattuca and Stark (2009) believe that looking at curricular change over time reveals that universities are reactive to societal pressures—that curriculum is a reflection, in fact, of its sociocultural context. We believe the time is right for major change in the design of curriculum because of the impact of current social reality and because of the research on learning that can inform the process. Furthermore, the success story of the Pušenjaj brothers illustrates two recurring themes that directly impact curriculum design. First, the brothers were not trained in the area of their success; they integrated multiple talents and knowledge bases. Second, they were resilient in the face of failure and no doubt learned from their failures, which eventually led to their success with Doodle Jump.



In this chapter, we will offer our answer to the question, *Why do we need to redesign our curricula?* Beginning with an exploration of the current and future need for employees who are creative, independent learners, we will then consider how the traditional view of curriculum as a vehicle for transmitting knowledge is counterproductive with regard to the goal of developing graduates with those qualities. Next, we present documentation that supports the belief that creativity and adaptability can be taught. We answer the “Why redesign curricula?” question by demonstrating how realigning traditional curriculum with a learner-centered paradigm has the potential to create learning environments that are conducive to supporting independent learning and creativity.

The Call for Creativity and Adaptability

The societal need for autonomous learners who adapt quickly to new situations, who are engaged in lifelong learning, and who are flexible and innovative in their approach to problem solving is well documented (National Leadership Council for Liberal Education and America’s Promise, 2007). A national survey conducted by Peter D. Hart Research Associates for the American Association of College and Universities asked employers to rate new hires in the skills that are generally agreed on to represent the abilities necessary to succeed in the twenty-first-century workforce. The results looked like a bell curve: not many A’s or F’s, mostly mediocre. Although these results may indicate that the United States is not in the dire circumstances that some have claimed previously, they do show that employers are not completely satisfied either. The results of this survey as well as the findings of other business and industry studies and independent educational research teams all indicate that higher education needs to do a better job of preparing students.

In its publication *College Learning for the New Global Century*, the National Leadership Council for Liberal Education and America’s Promise (2007) outlines four broad areas in which all students



should be prepared: (1) knowledge of human cultures and the physical and natural world; (2) intellectual and practical skills, including inquiry and analysis, critical and creative thinking, written and oral communication, quantitative literacy, information literacy, teamwork, and problem solving; (3) personal and social responsibility, including civic knowledge and engagement—local and global—intercultural knowledge and competence, ethical reasoning and action, and foundations and skills for lifelong learning; and (4) integrative learning, including synthesis and advanced accomplishment across general and specialized studies. Although the publication focuses on developing general education programs to address these areas, these general education outcomes can also serve as the structure of a reasonable degree program that develops in students an appreciation for and fluency with diversity in all its forms and prepares them for engagement in an increasingly globalized society. Of particular interest to us in regard to curriculum is the call for integrative learning.

As the report states, “In a world of daunting complexity, all students need practice in integrating and applying their learning to challenging questions in real-world problems,” and continues, “In a period of relentless change, all students need the kind of education that leads them to ask not just ‘how do we get this done?’ but also ‘what is most worth doing?’” (National Leadership Council for Liberal Education and America’s Promise, 2007, p. 13). These perspectives are widely agreed on at the present time, but it is not always clear how we might arrive at the stated outcomes. The report authors argue,

The general public—and many college students—continue to believe that choosing a “marketable” major is the key to future economic opportunity. Guided by this conviction, many students see study in their major field as the main point of college, and actively resist academic requirements that push them toward a broader

education. Many policy makers hold a similar view of career preparation, evidenced by their support for occupational colleges and programs that promise initial job readiness but not much else.

Those who endorse narrow learning are blind to the realities of the new global economy. Careers themselves have become volatile. Studies already show that Americans change jobs ten times in the two decades following college, with such changes even more frequent for younger workers. Moreover, employers are calling with new urgency for graduates who are broadly prepared and who also possess the analytical and practical skills that are essential both for innovation and for organizational effectiveness. (pp. 15–16)

As early as 1994, Bridges claimed that the concept of job security was a thing of the past, that today's workforce is operating by a new rule system, a new paradigm in which all workers are contingent and that a worker's value to an organization must be proven on a daily basis. Graduates can no longer expect to spend an entire career with one company climbing the corporate ladder, but rather must think of themselves as in business for themselves and maintain a career-long professional development plan. And this new workplace is a project-based team environment that demands agility and adaptability on the part of the worker. Bridges (1994) wrote, "These new rules are still evolving and are becoming operative in some parts of the economy more quickly than others. . . . At Sun Microsystems, Apple Computer, Intel and hundreds of smaller high-tech companies, these rules are already obvious" (p. 52). His predictions proved correct.

IBM conducted a global study of the elements needed for enhancing workforce performance in today's turbulent environment. From their survey of four hundred organizations in forty countries, the researchers concluded that the key to enhanced

workforce performance was “an adaptable workforce that can rapidly respond to changes in the outside market” (IBM Global Services, 2008, p. 1). In other words, we need workers who are creative and who can adapt and solve problems in new ways. Yet creativity and adaptability have not been a major focus in the undergraduate experience.

Bronson and Merryman (2010) claimed in a *Newsweek* article that American creativity is actually declining. They make the point that while other countries are making creativity a national priority, we’re headed in the opposite direction. The authors further note that student scores on creativity tests are dropping at the same time that their IQ test scores are rising. So the question remains, what needs to change in our education system in order to develop creative problem solvers for this world of daunting complexity? Bronson and Merryman pointed to the ironic state of educational reform. Currently the Chinese are replacing their “drill and kill” teaching with problem-based learning. At the same time, we are continuing to argue about standardized curricula, rote memorization, and nationalized testing. These authors noted that “overwhelmed by curriculum standards, American teachers warn there’s no room in the day for a creativity class. Kids are fortunate if they get an art class once or twice a week” (p. 3). And herein lies the problem with our current way of thinking about creativity as well as about curriculum. First is the assumption that fostering creativity is the sole domain of a single discipline, namely art education, and second is the knee-jerk response to a curriculum issue: add a course.

Legislators and others continue to call for more tests in order to drive the needed changes in undergraduate education. More evaluation of the current curriculum will not foster needed change. To use an agricultural metaphor, calling for more testing is like trying to make the sheep fatter by weighing them more often when what they need is a richer pasture. Supplementing the current undergraduate diet with additional courses in global knowledge and

critical thinking or creativity will not address the need either. What is needed is a redesigned undergraduate educational experience that will foster creativity as well as learner autonomy.

Can Creativity Be Taught?

Feldman, Czikszentmihalyi, and Gardner (1994) make the case that creativity has multiple meanings, which can sometimes impede communication, so we will begin by defining what we mean by creativity. They define their use of the word as “the achievement of something remarkable and new, something which transforms and changes a field of endeavor in a significant way. In other words, we are concerned with the kind of things that people do that change the world” (p. 1). The most accepted general definition is simply the “production of something original and useful” (Bronson & Merryman, 2010). We like Franken’s definition of creativity as “the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others” (2006, p. 396), because it aligns most closely with our curricular goals and is probably a more reasonable way of thinking about teaching creativity. We are not expecting every student to change the world, but we can expect every student to recognize ideas and alternatives and learn to solve problems in new ways. Gardner (2006) described creative people as those who take risks without fear of failure while seeking the unknown or challenging the status quo. We will return throughout the book to the idea of taking risks with this attitude toward failure, in regard to creating suitable educational environments that foster creativity. Environment is key, as Czikszentmihalyi (1996) asserts. He maintains that creativity is tied to context—to interactions of talented people in an environment that is open and accepting of innovation. The role of environment will also serve as a theme throughout as we focus on environments that are conducive to learning.

In summarizing one hundred years of research on creativity, Plucker (2008) found that creativity more often than not involves teams and collaboration. Creative environments are collaborative and active. Feldman, Csikszentmihalyi, and Gardner's belief that reflection is the single quality that sets humans apart from other organisms (1994) is key to understanding creativity. In discussing the learner-centered curriculum, we will return to the concepts of risk taking, attitude toward failure, collaboration, and reflection as we consider ways to create curricula that respond to the need for creative thinkers.

Csikszentmihalyi's theory as to the role of context and cultural attitude toward creativity is reflected in a recent book that addressed creativity and innovation from a cultural perspective. Senor and Singer (2009) examined the Israeli phenomenon of entrepreneurship. Israel produces more start-up companies than China, India, Korea, Canada, and the United Kingdom in spite of what would appear to be limitations of size, geographical location, and perpetual political turmoil. The authors explain that Israel's impressive economic growth is a result of a unique mind-set. The Israeli mind-set, what some might call *chutzpah*, is an outgrowth of unique political and social realities. Senor and Singer attribute this mind-set for entrepreneurship to the military service that all citizens experience, coupled with the incredible diversity of cultural backgrounds within Israel. The military experience gives young Israelis a social range, a sense of responsibility, initiative, and agility of mind as well as ease with confronting authority, challenging accepted ways of doing things, critically analyzing and learning from mistakes, and assuming risk. Although the Israeli military experience may not be intentionally designed to foster creativity, there are certainly lessons to be learned. First, the experience creates an intense sense of community. Senor and Singer claim that the military experience creates a lifelong networking system that young Israelis capitalize on once their military experience is over. Control is also a key feature of the experience.

The young Israelis are expected to confront authority, they are given tremendous responsibility, and competence is expected. There is an acceptance of mistakes, provided that the individual learns from the mistakes and maximizes his or her potential as a result. In short, the environment fosters creative thinking.

Creative thinking thrives in environments that offer individual freedom, alternative thinking, safety in risk-taking, and collaboration and teamwork. Gardner (2008) noted in regard to educational environments and creativity that

Too strict adherence to a disciplinary track operates against the more open stances of the synthesizer or the creator. Options need to be kept open—a straight trajectory is less effective than one entailing numerous bypaths, and even a few disappointing but instructive cul-de-sacs. (p. 84)

In other words, the educational path needs to be more flexible and integrative.

Creativity requires seeing possibilities, seeing from a new perspective, and perceiving difference, or what Langer (1989) would call mindfulness. She defined mindfulness as the ability to create new categories and to maintain an openness to new information and an awareness of more than one perspective. Without these abilities, individuals become entrapped in habitual ways of thinking, solving problems, and seeing, thus leading them to miss new signals and opportunities. The ideal in teaching creativity as well as learner autonomy lies in teaching mindfulness, or, as Langer would define it, becoming attuned to our cognitive processes, thinking about what we perceive and deliberately noticing difference and distinctions in our observations. We will refer to this as intentionality, becoming aware of one's own process of learning.

Langer (1997) talks about the conditional and context-dependent nature of the world, cautioning against teachers' fostering

a belief in one right answer. She writes, “Teaching skills and facts in a conditional way sets the stage for doubt and an awareness of how different situations may call for subtle differences in what we bring to them” (p. 15). In Chapter Three, we will discuss her research to support this belief. Svinicki (2004) also discusses the limitations on student learning as a result of believing in one right answer. What she refers to as the “illusion of comprehension” is, in part, the result of students using flashcards or rereading as a means of studying. “They find comfort in looking at the same material over and over, mistaking their recognition of it in familiar context with an ability to recognize it out of context” (p. 117). She contends that this is why it is important for students to *use* information rather than simply identify it. When they are required to *do* something with the information, to take it from the familiar context and introduce it to another context, their illusion of comprehension is revealed; that, she claims, strengthens motivation to learn.

The seventh of seven principles of excellence espoused by the National Leadership Council for Liberal Education and America’s Promise is “Assess students’ ability to apply learning to complex problems.” The principle emphasizes both the student’s ability to apply learning in multiple contexts and the assessment of student abilities. We will return to the necessity of applying skills in unfamiliar contexts, or transfer, in subsequent chapters, as it is a fundamental principle for assessing deep learning, a concept we will look at in greater depth in Chapter Three.

Csikszentmihalyi (1999) examined the role society plays in innovation and creativity and determined that

creativity is not simply a function of how many gifted individuals there are, but also of how accessible the various symbolic systems are and how responsive the social system is to novel ideas. Instead of focusing exclusively on individuals, it will make more sense to focus on communities that may or may not nurture genius. (p. 335)

In other words, our classrooms as well as our institutions need to nurture creativity. Csikszentmihalyi recognized that creativity is the result of three elements in interaction: the individual, the cultural domain, and the social field, or those who pass judgment on the quality of the creative work. This implies that teachers, those who are the judges of the quality of creative work, can foster learning environments that support and encourage creativity through increasing the openness and flexibility of those environments and accepting learning from multiple sources. Rosenthal, Baratz, and Hall (1974) found that teachers' expectations about students' performance clearly influence that performance. Further, when students see their own teacher as more intrinsically oriented toward work, they perceive themselves as more competent and more intrinsically motivated. Langer (1997) concludes that students' intrinsic motivation and hence creativity are likely enhanced both by teachers' attitudes toward autonomy and self-direction in work as well as by their own ability to model those same behaviors.

New research in neuroscience is shedding more light on how creativity works. Bronson and Merryman (2010) summarize the research. They explain that creativity has been popularly thought of as a left-brain activity, but research is showing that it is in fact an activity involving both right and left hemispheres. When a person tries to solve a problem, the first brain activity involves sifting through familiar solutions and obvious facts, a left-brain activity. If the answer cannot be found there, the neural networks from the right side look for memories that might be relevant. Information that would normally be ignored by the left brain becomes available, thus widening the possibilities for solving the problem.

A wide range of distant information that is normally tuned out becomes available to the left hemisphere, which searches for unseen patterns, alternative meanings, and high-level abstractions. Having glimpsed such a connection, the left-brain must quickly lock

in on it before it escapes. The attention system must radically reverse gears, going from defocused attention to extremely focused attention. In a flash the brain pulls together these disparate shreds of thought and binds them into a new single idea that enters consciousness. (p. 4)

These two modes, referred to as divergent thinking and convergent thinking, are what characterize creative thinking, combining new information with old, even forgotten ideas. “Highly creative people are very good at marshaling their brains into bilateral mode, and the more creative they are, the more they dual-activate” (p. 4). They integrate diverse thoughts in order to solve problems.

Recent experiments have shown that this dual activation of the brain is teachable. The University of Georgia, the University of Oklahoma, and Taiwan’s National Chengchi University have independently studied creativity training exercises aligned with this science, all finding that creativity training works (Bronson & Merryman, 2010). Collaboration, creative problem solving, and problem-based learning have all been shown to increase creativity in children. This recent research supports what earlier researchers have maintained about creative learning environments: they must be flexible, free, open to unusual or divergent answers, and collaborative.

To summarize what we know about creativity, we know that it is a whole-brain activity that involves making connections between sometimes remote ideas. We know that the ability to do this is fostered through environments that are open and supportive of creativity and divergent thinking, and that teachers can either stifle or promote creativity in their students, through their own behaviors and through the learning environments they create.

To summarize what we know about whether creativity can be taught, we know that the attitude as well as the behaviors of teachers are key to creating an environment that fosters creative problem solving. Maintaining an openness to new ideas, a willingness to allow

students to make choices in how to engage, and presenting information in a conditional way rather than assuming only one right answer are all strategies that teachers can use to foster creativity. We also know that employing active learning strategies and encouraging teamwork and collaboration enhance creative output.

Can Adaptability Be Taught?

In addition to the societal call for creativity is the call for adaptability. Adaptability has to do with autonomy, with individuals who can learn on their own. In fact, many of the same recommendations regarding educational environments that foster creativity are also known to develop learner autonomy. These learner-centered strategies aim at developing independent learners who can think critically and solve problems—who can sort out the world of daunting complexity. As early as 1975, Knowles recognized that transmission of knowledge to passive recipients was no longer a viable means of education. Knowles (1975) identified the importance of self-directed learning in regard to adult learners and emphasized that when individuals take initiative for their own learning, they benefit not only by learning more but by retaining more.

More recently, Candy (1991) differentiated between self-directed learning as an educational goal and self-directed learning as an instructional method. As a goal, self-directed learning refers to self-management and personal autonomy. As a method of instruction, it refers to learners' assuming increased control in formal educational settings as well as planning and executing projects outside the formal setting. Here we refer to self-directed learning as a goal of education. Cognitive psychologists refer to this as self-regulation, a skill that can be developed through the incorporation of pedagogical strategies built into curricular design. Self-directed learning is essential to the development of inquiry skills that individuals need in order to adapt to rapid changes in their environment and to manage the great influx of information to be learned.

Self-regulation is defined by cognitive psychologist Albert Bandura as the ability of an individual to regulate his or her progress in achieving learning outcomes. Garavalia and Gredler (2002), Schapiro and Livingstone (2000), and Zimmerman (2002) have demonstrated that self-regulation can be intentionally crafted in courses to produce significant growth in essential learning behaviors. Self-regulation can be fostered through carefully constructing learning environments that prompt students to elevate their knowledge. McCombs (1989) and Zimmerman and Schunk (1994) identified skills that typify self-regulation; they fall into three categories: self-observation skills, self-judgment skills, and self-reaction skills. Nygren (2007) explained that “the knowledge expertise becomes stronger as the learner transfers and applies the skill in slightly different contexts. Eventually the learner will be able to use the skill in a completely new and unfamiliar context” (p. 165). In subsequent chapters, we will consider ways in which transfer of learning to different contexts can be integrated into the design of curricula.

Why Change Curricula?

If individual teachers can incorporate pedagogical strategies in their classroom in order to foster creativity and learner autonomy, why do we need to revise the entire curriculum? We believe that relying on individual classroom efforts to change the learning environment on a programmatic, college, or institutional scale is not strategic and does nothing to link and integrate those individual experiences. We believe that for graduates to develop the skills we have referred to in this chapter, curricular coherence, repeated experiences, and reflection on learning across courses are necessary. The design of the curriculum needs to integrate learning experiences for students in order to facilitate their growth as creative, independent learners.

The Association of American Colleges and Universities (AAC&U, 2004) and the Carnegie Foundation for the

Advancement of Teaching issued a statement in which they defined integrative learning as the learner's abilities to "integrate learning across courses, over time, and between campus and community life" (p. 1). This statement grew out of a project called Opportunities to Connect, in which ten campuses were selected to experiment with a variety of integrated learning strategies—linked courses, capstones, service learning, and learning portfolios—to create the "institutional scaffolding" for integrated learning. There has been widespread success with many of these strategies, and the successes individual campuses have achieved have been the result of extreme effort and dedication on the part of individuals committed to improving student learning outcomes. Part of the reason that these achievements have required such expenditure of energy and creativity on the part of the implementers is that our existing institutional scaffolding, also known as curriculum, is not conducive to flexibility and creativity.

The disconnect between traditional curriculum design and current student learning is the result of our approach to curriculum as a mechanistic process rather than an organic one. In the instructional view of learning that we will examine in greater depth in Chapter Two, learning is assumed to be the result of the professors' dispensing the right ingredients—course content. Once all the content has been dispensed, the student is complete. We know, though, that learning is an organic process dependent on numerous variables, including a student's prior learning, learning styles, motivation, and so on. Our curriculum design needs to reflect the organic nature of the process.

Rather than thinking of course content as pieces of a puzzle or ingredients in a recipe, we might use the metaphor of a gardener, who tends to the plant and provides nourishment, fertile ground, and other conditions conducive to growth, but who must stand aside and watch the plant grow on its own. Curriculum in this view is flexible and focuses on those elements that provide the learner nourishment and the conditions conducive to growth. The goal

of this curriculum framework is to develop autonomous learners. Specifically, the design of curriculum must shift from the traditional discipline-based approach in which types of knowledge (as in hours of general education versus hours in the discipline major) are at the core of the curriculum to a constructivist or learner-centered approach that focuses on the development of the learner.

The 1970s hosted a considerable number of experiments in curriculum designed to foster independent learning and interdisciplinary thinking. Many proved ineffective. What we propose differs in large part because of the significant advances in research on learning that have taken place since that time, the research that serves as the basis for the learner-centered agenda. The learner-centered agenda proposes to shift responsibility for learning to the student, with the added benefit of stimulating student motivation for learning. It lays the foundation for creating learning environments that foster learner autonomy as well as creativity.

The Learner-Centered Environment

Bransford, Brown, and Cocking (2000) identify four features characteristic of learner-centered learning environments; they must be “student centered, knowledge centered, assessment centered and community centered” (p. 153). In thinking about curriculum, educators tend to focus on knowledge and skills that students must acquire but rarely discuss the role of learners’ attitudes and beliefs or the environment. When we speak of environment, we mean the surrounding influences, the set of conditions that have an impact on learning. There are a multitude of such influences, including the attitude or mind-set for learning that the learner brings, the impact of the student’s prior learning, the culture of learning that is fostered, the physical environment, and more. The current efforts to transform educational environments toward learner-centeredness are to a great extent an attempt to motivate students to be intentional learners and to change their attitude about learning—to develop a new mind-set.

Alfred Binet, inventor of the original IQ test, is quoted as saying, “[Some] assert that an individual’s intelligence is a fixed quantity which cannot be increased. We must protest and react against this brutal pessimism” (Shenk, 2010, p. 29). Yet probably most people continue to believe that they inherit their intelligence from their parents and that’s that. A body of research from both neuroscience and psychology suggests that intelligence is not only malleable but capable of growing in response to specific environmental stimuli. Shenk concludes that “intelligence is not an innate aptitude, hardwired at conception or in the womb, but a collection of developing skills driven by the interaction between genes and environment” (p. 29). He asserts that the question of nurture versus nature should be replaced with an acceptance of both nurture *and* nature. “The dynamic model of genes times environment ($G \times E$) turns out to play a critical role in everything. . . . We cannot embrace or even understand the new world of talent and intelligence without first integrating this idea into our language and thinking” (p. 27).

Most difficult to recognize and perhaps the most powerful belief that affects learning is the student’s belief in his or her ability, or self-efficacy. Students with high self-efficacy are more persistent in their learning in the face of difficulties. They interpret failure not as a personal failing but as a single poor performance that can be overcome with hard work. A student’s sense of self-efficacy depends on his or her type of goal orientation: toward learning goals or toward performance goals (Dweck & Leggett, 1988). Students who are motivated by learning goals accept error and are highly motivated to understand and conquer new concepts or material. Those motivated by performance goals are interested in demonstrating competency. They are less willing to take risks because they want to avoid failure in their performance. Dweck (2000) has described these two types of learners in terms of two theories of intelligence: the entity and incremental theories.

The entity theory (later referred to as the fixed mind-set) posits that intelligence is static. Individuals are imbued with certain intelligence or ability that cannot be acted on by effort. In contrast, incremental theory (later referred to as the growth mind-set) posits that intelligence is malleable and can be affected by effort. Dweck's research has shown that individuals' belief in their intelligence or ability level affects their motivation to learn and subsequently their success at learning.

Those of us who have worked with developmental students have seen firsthand the effects of students' belief that they can't learn something simply because they have not been successful at it in the past or have been told that they aren't good at it. We have also witnessed (perhaps not as often as we would like) the tremendous excitement and sense of reward these same students experience when they do succeed, for they have been freed from a belief that has sometimes prevented them from even trying to learn. This experience is not restricted to developmental learners by any means, but the successes with those students are sometimes more readily apparent. The point we want to emphasize is that if we are to create motivated learners, we must first convince them that they can in fact learn, that their intelligence is not fixed but expandable.

Directly tied to one's attitude about intelligence is how one responds to failure. According to Dweck (2000), individuals who subscribe to a fixed mind-set see failure as an indication of less intelligence. Therefore, those who have a fixed mind-set are less likely to take risks or approach challenging problems. They stick with what they can perform well in order to demonstrate that they are intelligent. Those who subscribe to a growth mind-set, in contrast, see failure as a challenge to be conquered. To paraphrase an old adage, when the going gets tough, the growth mind-set gets going! Gardner (2008) described this as a singular quality of creative individuals. He noted that the creator is perpetually

dissatisfied with his or her current work, enjoys striking out in unusual directions, and is robust about failure.

All of us fail, and—because they are bold and ambitious—creators fail the most frequently and often, the most dramatically. Only a person who is willing to pick herself up and ‘try and try again’ is likely to forge creative achievements. (p. 83)

Senor and Singer (2009) provided numerous examples of this approach to failure in their examination of the innovative mind-set of the Israeli military. They describe the debriefing process as a time to show what the individual learned from his or her mistakes. “The effect of the debriefing system is that pilots learn that mistakes are acceptable, provided they are used as opportunities to improve individual and group performance” (p. 94). Shenk (2010) claims that “in the sometimes counterintuitive world of success and achievement, weaknesses are opportunities; failures are wide-open doors” (p. 115). Failure provides an individual with an opportunity to examine his or her thinking and make adjustments. Therefore, in creating learning environments that are conducive to creativity, we need to be very attentive to our attitudes and reactions with regard to failure.

The teacher’s mind-set is equally as important as the students’. In a study by Deci, Nezlec, and Sheinomy (1981), teachers’ beliefs in the importance of student autonomy correlated significantly and positively with their students’ preference for challenge, curiosity, and desire for independent mastery.

Creativity and the Power of Choice

Sharing power with students is a key factor in learner-centered practices as well as in developing creativity. Giving students opportunities to choose fosters engagement with content and

helps ensure that they find activities relevant. The same is true in regard to creativity. Amabile's extensive study of creativity (1996) outlined the factors that affect creativity in learning environments. Most important is openness, both physically in terms of classroom configuration and metaphorically in terms of a sense of freedom and safety. We will address the impact of physical spaces for learning in Chapter Eight and offer examples of contemporary design that are open and flexible. Less structure and fewer teacher-initiated constraints also correlate with creative productivity.

It is clear that people support what they help build. Sharing power also increases student motivation, and motivation and persistence are key to innovation. Amabile (1996) addresses the relationship of motivation and creativity to power and control. She identifies three components related to people's creative output: (1) people's knowledge, experience, and talent in a given area; (2) their cognitive style—their energy, persistence, and ability to see new perspectives; and (3) their motivation. She reviews numerous studies showing that the factors that encourage intrinsic motivation are the same as those that motivate creativity.

She notes the difference between intrinsic and extrinsic motivation: "intrinsic motivation is conducive to creativity, but extrinsic motivation is detrimental" (p. 15). Extrinsic motivation arises when goals are imposed on the learner by others, when the learner feels powerless. Pink (2011) notes that this phenomena has been studied by psychologists, sociologists, and economists, all coming up with the same counterintuitive result. Rewards do not incentivize learning except in cases of performance of rudimentary mechanical skills. Once cognitive skills enter the problem-solving equation, then additional external rewards lead to poorer performance.

Rewards alone do not necessarily lead to enhanced performance. Although the type of reward may be a determiner, individual choice and control play an integral role as well. Amabile writes, "Choice can be an important mediator of the effects of reward on creativity" (p. 168). When individuals are given choice—not necessarily in

whether to engage in an activity but choice in *how* to engage in an activity—creativity is increased.

An interesting illustration of this phenomenon takes place in the Australian software company Atlassian. One day per quarter, software developers are given total autonomy. They are told to create something however and with whomever they wish. The atmosphere is very open and fun, almost like a party. The only caveat is that they must present the results of their effort in twenty-four hours. What the company has found is that those twenty-four-hour sessions have produced an amazing array of creative ideas and new software solutions (Pink, 2011). The freedom to make choices regarding what to work on and whom to work with leads to tremendous creative output.

Choice is also part of learner-centered pedagogy. Learner-centered practices motivate learners by offering them control over their learning and creating a sense that the learning tasks have relevance. Learner-centered pedagogy fosters the sharing of power between students and teachers. When teachers offer students choices and responsibility and contextualize learning to increase the sense of relevance, the result is intrinsic motivation for learning and learning environments that are conducive to creativity and innovation.

Cognitive psychologists have added greatly to our understanding of motivation. Rather than seeing individuals as purely behavior-based organisms responding to positive and negative stimuli, psychologists have studied how motivation may be a function of interpretation. A cognitive view of motivation supports learner-centered pedagogy because it places motivation in the realm of the learner rather than treating the learner as the recipient of stimuli he or she then reacts to. Social cognitive theory places motivation in the mind and the environment of the learner.

Svinicki (2004) proposed an amalgamated theory of motivation that combines three prominent theories: the expectancy value model of Wigfield and Eccles (2000), the social cognitive model of Bandura (1997), and the goal orientation model of Dweck and

Leggett (1988). Svinicki explains that motivation is a balancing of the value of the goal and the expectation that the goal can be achieved. Both are motivators. “When students have the opportunity to make decisions for themselves, they are most vested in the outcomes of those decisions and therefore more likely to invest the effort necessary to make the outcomes happen” (p. 155). Furthermore, self-determination fosters self-confidence and self-esteem. She adds, “the degree that you can share control with them [students] you will have a more compliant audience” (p. 156).

Pink (2011) summarized research on motivation, noting that three factors lead both to better performance and to personal satisfaction: autonomy, mastery, and purpose. Autonomy leads individuals to become engaged in an activity as opposed to merely complying with someone else’s direction. Mastery of tasks causes individuals to experience self-satisfaction. Pink uses the example of individuals who play a musical instrument for fun. They practice the instrument for hours and hours on their own time in order to improve. They do so because of the reward of improvement, not because someone is making them practice. The same is true for people who enjoy a sport or other activity that requires practice for mastery. There is intrinsic reward associated with making progress. Finally, people feel motivated to contribute to some greater good, to have a purpose to their work. As we noted earlier, in learner-centered pedagogy, this need for purpose is tied to making learning relevant to the student. When students understand the relevance of subject matter, they are more motivated to learn it.

Chapter Summary

We opened this chapter asking, *Why redesign curriculum?* Our answer: the shift toward learner-centered pedagogy represents an important step in the quest to develop creative, autonomous learners who can readily adapt to a rapidly changing society. Learner-centered techniques foster creativity and innovative thinking, absolutely essential abilities for today’s workforce.

The institutional shift toward learner-centeredness is not a new idea. Many institutions make the claim that they are learner-centered; however, more often than not, that claim refers to pedagogy or individual efforts like those described in the AAC&U Opportunities to Connect project. In *Leading the Learner-Centered Campus* (Harris & Cullen, 2010), we made the case that the entire institution must shift its focus toward learner-centeredness if there is to be a true paradigm shift. All practices and processes in all divisions of the institution need to be part of that shift. If we confine the shift toward learner-centeredness to the individual classroom, we will limit its impact. To return to the analogy mentioned in the Preface, it would be like putting contemporary furniture conducive to collaboration in a tiered classroom. We need to consider the larger framework of the educational experience—the curriculum—and make efforts to design that curriculum such that the pedagogy of the individual classes maximizes its potential. The Wingspread Group on Higher Education made the following statement in regard to essential educational reform: “Putting learning at the heart of the academic enterprise will mean overhauling the conceptual, procedural, curricular, and other architecture of postsecondary education on most campuses” (1993, p. 14). In the remaining chapters, we will provide a framework for reconceptualizing curriculum in order to put learning at the heart of the enterprise, and in the final chapter we will address quite literally the architecture of postsecondary education.