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STUCK IN A RUT: THE ROLE OF CREATIVE THINKING IN PROBLEM SOLVING AND LEGAL EDUCATION

JANET WEINSTEIN AND LINDA MORTON*

This article focuses on the mental process of creative thinking. We discuss what it is, why we have difficulty engaging in it, and how we can overcome this difficulty through specific techniques and a more conducive environment. Creative thinking is an essential component to problem solving. In training future lawyers, we must do a better job of incorporating and supporting creative thinking in legal education. We conclude the article with a description of some of our efforts toward this objective.

Stuck, stuck, stuck in a rut;
Solving a problem's like cracking a nut.
Without the right tools
You can't do the work –
You'll stress and waste time
And look like a jerk.

It's time we admit our long-standing denial.
Treading one path will impede our survival.
By connecting synapses
We'll end mental lapses,
So in rut-jumping we'll not have a rival.

INTRODUCTION

The ability to engage in creative thinking is essential to problem solving.¹ Problem solving is the essence of what lawyers do.² If we

* Janet and Linda are professors at California Western School of Law in San Diego. Janet enjoys painting and long walks with her dogs. Linda has recently taken up sculpting. We would like to thank our family members and friends, who have supported and encouraged our efforts to explore creative thinking. Additionally, we appreciate the support of the McGill Center for Creative Problem Solving at California Western. Finally, these correct footnote citations would not exist, but for the detailed precision of our research assistant, David Wilkinson.

¹ Potentially, creative thinking and problem solving are one and the same. J.P. Guilford refers to their identical models and explains that problems would not exist if they could be resolved according to previously created patterns. To the extent that problem solving includes some aspect that is new or novel, it involves creative thinking. J.P. GUILFORD, *INTELLIGENCE, CREATIVITY, AND THEIR EDUCATIONAL IMPLICATIONS* 127 (1968).

Several others have linked problem solving with creative thinking. See, e.g. Janet

are to train students to become effective lawyers, then we must train them to be creative thinkers. Legal education, for the most part, fails to accomplish this because it is, as will be described in this article, stuck in a rut. Law professors tend to cling to the analogical reasoning we were taught and with which we feel most comfortable, ignoring important alternative thinking processes.

This article focuses on the alternative process of creative thinking - what it is, and why some of us have difficulty with it. We attempt to offer insights for faculty who wish to better incorporate the creative process into their own thinking repertoires, and hope for those skeptics who falsely feel that learning to think creatively is an implausible goal.

The article presents concepts regarding problem solving drawn from the fields of creativity, creative thinking, psychology, and neuropsychology. It is our hope that a basic understanding of mental processes will augment the discussion about the need for expanded training in creative thinking for law students. While several authors have described the need for creativity in the practice of law,³ and the

Reno, *Lawyers as Problem-Solvers: Keynote Address to the AALS*, 49 J. LEGAL EDUC. 5, 6 (1999) ("Problem-solving, as I understand it and as I appreciate its practice at the Department of Justice, places emphasis on creative thinking."); Graham B. Strong, *The Lawyer's Left Hand: Nonanalytical Thought in the Practice of Law*, 69 U. COLO. L. REV. 759, 798 n. 195 (1998) ("It has been suggested that the legal problem-solving process and the creative process itself are but two branches of the same tree, with structures that are essentially identical.") (Citations omitted).

See also ROSALEEN A. MCCARTHY AND ELIZABETH K. WARRINGTON, COGNITIVE NEUROPSYCHOLOGY: A CLINICAL INTRODUCTION 345 (1990). "Problem solving comes into play when we initiate nonhabitual or novel patterns of behavior which require the reorganization of sets of established cognitive skills or when we have to change our habits." As discussed in this paper, these diversions from habitual behavior and thoughts are at the core of creative thinking.

² By using the term "problem solving" here we are not referring to the rote or patterned issues that lawyers can easily resolve by filling out forms or filing motions from a motion bank. Every situation a client brings to a lawyer may be a problem for the client because the client does not have the problem solving structure necessary for the resolution, but not necessarily a "problem" for the lawyer. See also Gordon A. MacLeod, *Creative Problem-Solving for Lawyers*, 16 J. LEGAL EDUC. 198 (1963) (creative problem solving is the essence of the service you offer your clients). Of course, good interviewing and counseling skills are required to determine whether even the simplest situation on its face actually calls for a creative resolution. See Steven Keeva, *What Clients Want*, 87 A.B.A.J. 48 (2001) (describing abilities of lawyer Arnie Herz to uncover clients' true needs and create solutions responding to them).

³ Lawyers working with clients face problems that cannot be most effectively resolved through traditional application of the rules of law or ordinary analytical skills. This is not new information; the practice of mediation and the refinement of negotiation and other forms of alternative dispute resolution are an acknowledgment that the profession must keep growing in order to serve its clients. See generally, Strong, *supra* note 1 (discussing how a combination of thought processes is necessary for legal case building); Carrie Menkel-Meadow, *When Winning Isn't Everything: The Lawyer As Problem Solver*, 28

need to train our students to be more creative,⁴ none have actually defined the creative process in a way that would allow us to understand exactly what creative thinking is, how to develop our cognitive processes to include it, and how to encourage it in legal education. As educators, we pride ourselves on teaching students to be logical and to work from a strong foundation of knowledge; we can become more effective if we add information about how the brain works to our knowledge base and use it in our teaching.

The first part of this article defines creative thinking and discusses how we are all capable of engaging in it.⁵ Part II provides a basic foundation for understanding what needs to happen in the brain to make creative thinking occur. This part also demonstrates how brain processes can make change difficult and impede creative thinking. Part III discusses specific techniques to encourage its inception, while the fourth part describes the internal and external factors necessary to inspire creative thinking. The final part offers suggestions as to what law schools can do to further encourage the process.

I. CREATIVE THINKING DEFINED

In spite of the fact that many law professors and law students might not consider themselves to be so, almost everyone has the capacity to be a creative thinker.⁶ “Creative thinking . . . is the genera-

HOFSTRA L. REV. 905 (2000) (lawyers need to be able to “think outside of the box” to solve the complex problems that clients have).

⁴ “The boundaries that lawyers draw are constructed of rights and liabilities. The tendency to put one’s head down and ‘lawyer’ a problem is among the chief occupational hazards of our profession.” Paul Brest and Linda Krieger, *On Teaching Professional Judgment*, 69 WASH. L. REV. 527, 538 (1994). See Comments of Diane Yu, *Plenary III: Mobilizing Creative Problem Solvers*, 37 CAL. W. L. REV. 83, 92 (2000) (suggesting the importance of teaching students to think nonlinearly). For a sampling of law review articles on the topic, see generally, Maureen E. Laflin, *Toward the Making of Good Lawyers: How an Appellate Clinic Satisfies the Professional Objectives of the MacCrate Report*, 33 GONZ. L. REV. 1, 7 (1998) (discussing how an appellate clinic develops students’ creativity); Alan M. Lerner, *Law & Lawyering in the Workplace: Building Better Lawyers by Teaching Students to Exercise Critical Judgment as Creative Problem Solver*, 32 AKRON L. REV. 107, 109 (1999) (describing first year course in which goals were to develop student lawyers as “creative solver[s] of complex problems”); David R. Culp, *Law School: A Mortuary for Poets and Moral Reason*, 16 CAMPBELL L. REV. 61 (1994) (describing how legal education stifles creativity, and how it can be restored).

⁵ Any individual’s capacity for creative thinking might be limited by genetic traits. In this article we discuss brain activity as it relates to experience. While there is some controversy as to the relative contribution of genes vs. environment in shaping our brains, there is little question that genetic inheritance plays a role. See, e.g., STEVEN R. QUARTZ & TERENCE J. SEJNOWSKI, *LIARS, LOVERS, AND HEROES: WHAT THE NEW BRAIN SCIENCE REVEALS ABOUT HOW WE BECOME WHO WE ARE* 27 (2002) (“You are flexible because of your genes, not in spite of them.”).

⁶ “Creativity is not the exclusive property of geniuses; it comes in both large and small sizes. It is something we all have – and something we can all develop.” BARRY F. ANDER-

tion of ideas (a) that are unusual, or original, and (b) that satisfy some standard of value.”⁷ It is the combination, in a new way, of what is already known in order to achieve a desired end.⁸ An idea may be a tried and true concept in a different context, but qualify as a creative idea when applied in a new way within the context of solving legal problems or teaching law school. Creative thinking is exploratory – a thinking process that ventures out from the accustomed way of considering a problem, to find something else that might work. It is different from the attribute, “creativity,” which is more value-laden and tends to be often linked with art (in its broad sense).⁹

The subject of creative thinking is not new; numerous theories and definitions are available for examination.¹⁰ We provide a few of these definitions here, with examples drawn from law teaching or law practice, to develop a sense of what creative thinking is, rather than to settle upon one particular definition. As will be discussed in the next part, each of these definitions stems from what knowledge we have as to how the brain works.

A. Forward Thinking

Creative thinking is sometimes described as “forward” thinking. Forward thinking implies invention – moving toward something new – rather than falling back on old patterns of thinking.¹¹ Much of the thinking we do in law school can be labeled as “critical” thinking; its focus is to doubt, to critique, or to find fault with what already exists. It is not intended to move forward into something new, but rather to

SON, *THE COMPLETE THINKER* 123 (1980). Again, this proposition is limited by genetic endowment as discussed in footnote 5. See also STEPHEN D. EIFFERT, *CROSS-TRAIN YOUR BRAIN* 1 (1999) and EDWARD DE BONO, *SERIOUS CREATIVITY: USING THE POWER OF LATERAL THINKING TO CREATE NEW IDEAS* (1992) (hereinafter *SERIOUS CREATIVITY*).

⁷ ANDERSON, *supra* note 6, at 123. For example, to say that half of 8 is 4 satisfies our values, but is not unusual; half of 8 is 100 is unusual, but does not satisfy our values. However, to say that half of 8 is 0 (cut horizontally) or 3 (cut vertically) satisfies both standards of originality and value. *Id.*

⁸ See Thomas B. Ward, Steven M. Smith, & Jyotsna Vaid, *Conceptual Structures and Processes in Creative Thought*, in *CREATIVE THOUGHT: AN INVESTIGATION OF CONCEPTUAL STRUCTURES AND PROCESSES* (Thomas B. Ward, Steven M. Smith, Jyotsna Vaid eds., 1997). “Conceptual combination has long been touted as a wellspring of creativity for writers, artists, musicians, scientists, and other innovators. The common intuition among creators and observers of the creative process is that the merging of two or more concepts can result in a novel entity that is more than the simple sum of its component parts.” *Id.* at 6.

⁹ EDWARD DE BONO, *THINKING COURSE* 58 (rev.ed.1994).

¹⁰ For a thorough discussion of creative thinking in an historical context, see ARTHUR KOESTLER, *THE ACT OF CREATION* (1976).

¹¹ ANDERSON, *supra* note 6, at 122. For additional discussion of forward vs. backward thinking, see Ian Weinstein, *Lawyering in the State of Nature: Instinct and Automaticity in Legal Problem Solving*, 23 *VT. L. REV.* 1, 124 (1998).

examine the past – what has already been done. The focus of creative thinking is to come up with new alternatives.¹²

From the perspective of law practice, critical thinking is useful when we are engaged in traditional legal problem solving in the adversarial context, particularly in litigation. We examine what the parties have already done and how they might be at fault. We review legal doctrine to critique the facts and to determine our client's chances of success. In class, we use critical thinking to review a court's opinion.

On the other hand, we use forward thinking to help clients consider what alternatives might exist for solving their problems. We might also use forward thinking in the classroom when considering solutions to policy issues that underlie much of our substantive law, when thinking about what we can do for a client in a clinical setting, when considering solutions to a problem a student is having in an externship setting, or when planning a new course. Rather than critique what has already occurred, we start with the existing situation and work to find something new that will improve it.

B. Generativity Theory

Robert Epstein, a social psychologist, has conducted years of research on the subject of creativity and concludes that everyone has creative potential. He has found that creativity is a predictable, orderly process that can, therefore, be “engineered.”¹³ Epstein's model, Generativity Theory, posits that all people have a vast number of learned behaviors and engage in several different behaviors at the same time.¹⁴ Individual differences in behaviors are accounted for by genetics and our unique “environmental histories.”¹⁵ Novel behavior, or creativity, arises when our existing repertoires of behavior are in competition.¹⁶

Generative thinking frequently is implicit in classroom discussion. Case discussions that highlight the conflict between two important social policies might give rise to problem solving through this method, assuming time were allowed for such discussion. Similarly, in working

¹² ANDERSON, *supra* note 6, at 66.

¹³ EPSTEIN, CREATIVITY GAMES FOR TRAINERS: A HANDBOOK OF GROUP ACTIVITIES FOR JUMPSTARTING WORKPLACE CREATIVITY 13 (1996) (hereinafter GAMES).

¹⁴ *Id.* at 14.

¹⁵ *Id.* at 14-15. A person needs to have a “threshold intelligence” or be “smart enough” to acquire the knowledge and skills that will be used in creative thinking. Ken Heilman, *Creativity: From Einstein to Autism*, presented at the XXVth Annual International Neuropsychological Society Conference in Stockholm, Sweden, July 24-72, 2002. This intelligence is a factor of genetics and personal experience (*id.*, discussing Spearman's “G Factor” – predictable and genetic nerve growth factors arise in an enriched environment). See ANNE ANASTASI, PSYCHOLOGICAL TESTING 381-82 (6th ed. 1988).

¹⁶ EPSTEIN, GAMES, at 15.

with clients to resolve problems, conflicts within a client's personal value system might give rise to the need for creative thinking. The focus of generative thinking is that the mind is faced with a conflict that requires something new for resolution; this conflict generates the solution. Our discussion of the brain in the next part will elucidate this process.

C. Whole-brain Thinking

Whole-brain thinking is a term coined by trainer-consultant Stephen D. Eiffert. According to Eiffert, we can maximize our creativity by moving back and forth between the more verbal left side of the brain and the more spatial right. Whole brain thinking occurs when both sides become constructively engaged in the thinking process.¹⁷ While, as will be discussed in the next part, both sides of our brains are always engaged, we tend to favor our more verbal left side in law school training. Whole brain thinking, in a sense, is always occurring; however, it is somewhat stifled by our proclivity toward analytical thought.

Whole brain thinking is evident in courses such as Client Counseling, Mediation, and Trial Practice. Students enrolled in these courses learn the importance of attending to people's feelings, as well as the content of what they say. Subjects like active listening and body language are areas of expertise for the right side of the brain, while speech content is emphasized in the left hemisphere.

D. Lateral Thinking

Educator Edward De Bono labels creative thinking as "lateral" thinking. De Bono describes lateral thinking as the ability to change concepts and perceptions by shifting paradigms.¹⁸ According to De Bono, lateral thinking "involves an understanding of how the mind uses patterns and the need to escape from an established pattern in order to switch into a better one." The term "lateral" may be contrasted to the term "linear," which describes the usual thinking process we engage to analyze legal problems. As we attempt to solve a problem, our natural tendency is to apply the thinking process with which we are most comfortable, or habituated - what de Bono refers to as "self-organized patterns of thinking." This will be discussed in further detail in the next part on the working of the brain. De Bono suggests several "tools" for use in shifting between our self-organized patterns

¹⁷ EIFFERT, *supra* note 6, at 59-60.

¹⁸ DE BONO, *SERIOUS CREATIVITY*, *supra* note 6 at 15, 54-55.

of thinking,¹⁹ many of which are detailed in Part III. Such shifting requires fluidity of perception and openness to multiple perspectives.²⁰

For example, a lawyer too mired in legal reasoning may examine a personal injury case only from a legal point of view: are there sufficient duty, breach, cause, and damages. A more expansive and useful analysis would examine the case from the perspective of other disciplines, such as medicine, psychology, and business. The lawyer might incorporate how a doctor would approach the case (insure the client's future healing), or a psychiatrist (avoid further trauma through litigation), or a business person (attend to economic concerns that have been created by this injury). Similarly, in our teaching, we might examine a Torts Case from a Property, or even Criminal Law perspective, thereby using our lateral thinking techniques. Such thinking is enhanced by working in a multidisciplinary environment.

E. Divergent Thinking

Psychologist J.P. Guilford, one of the first to attempt to define creativity as separate from intelligence in his 1950 Presidential Address to the American Psychological Association, emphasized the divergent (expansive), rather than convergent (constrictive), thinking process required for creativity.²¹ A divergent thinking process re-

¹⁹ *Id.* at 77-189.

²⁰ *Id.* at 62. The genetic contribution to this skill might be the flexibility available to make such shifts. See discussion in *supra* note 5. In Andrew J. McClurg's class he asked students to explain why Katko prevailed in his suit against the Brineys, even though Katko was in the process of robbing their home when he was injured by the spring gun. The legal ("correct") response to the question was based upon the law's valuing of human life over property. One of McClurg's students responded with an example of lateral thinking: "I think the plaintiff won because he's a hunk." The student was reacting to the stimulus of the pictures of the parties provided to the class; this stimulus helped her jump out of the linear thinking process. Andrew J. McClurg, *Poetry in Commotion: Katko v. Briney and the Bards of First-year Torts*, 74 OR. L. REV. 823, 824-28 (1995) (McClurg concluded that this student was probably correct after conducting his own research on our tendencies to associate good qualities with attractive people).

²¹ J.P. Guilford, *Creativity Research: Past, Present and Future - Part One: The 1950 Presidential Address to the American Psychological Association* in FRONTIERS OF CREATIVITY RESEARCH: BEYOND THE BASICS 41-44 (Scott G. Isaksen, ed. 1987). See RONALD A. FINKE, THOMAS B. WARD, & STEVEN M. SMITH, CREATIVE COGNITION: THEORY, RESEARCH AND APPLICATIONS 183 (1992) (discussing the role of divergent thinking in creative problem solving); EPSTEIN, GAMES, *supra* note 13, at 14 (discussing how creativity is borne out of "multiple repertoires of behavior"). More recently, Stephen Eiffert has stressed the importance of divergent, forward-thinking over linear, backward thinking in his book CROSS-TRAIN YOUR BRAIN, *supra* note 6. "Creative, formative thinking focuses on the bigger picture, constantly working to encourage a larger more inclusive perspective. Rather than reduce and separate, it attempts to connect, relate, and associate." *Id.* at 155. *But see* DE BONO, SERIOUS CREATIVITY, *supra* note 6, at 55, 159 (describing divergent thinking as but one aspect of creativity).

quires openness to considering factors that might not have seemed relevant in a traditional problem solving exercise. The usual process for solving legal problems is to narrow down, i.e., constrict, the factors that are determined “relevant” for the solution. In divergent thinking, all possible factors are examined to see how they might influence the situation. Guilford believed the ability to synthesize and reorganize information, as well as fluency in generating ideas, to be important aspects of creative intellect.²²

Guilford’s divergent thinking is not often found in the traditional substantive law school course. Professors and students might believe that consideration of factors not “relevant” to the legal outcome of the case would be a waste of time. However, in real problem solving situations, and in courses such as Client Counseling, Mediation, and Trial Practice, there is an acknowledgement that it is sometimes these “irrelevant” factors that make the difference in the outcome of a problem. How a victim felt about the crime makes a difference in how the jury perceives the case, even though it is not one of the elements of the crime. In our teaching, how our students feel about the subject matter or the outcome of a case they read may affect what they will learn. When we consider teaching techniques we have to be aware of all of these factors in order to maximize our effectiveness.

F. *Multiple Intelligences*

Howard Gardner has developed the theory that humans have several different “intelligences” (linguistic, logical-mathematical, musical, bodily kinesthetic, spatial, interpersonal, and intrapersonal).²³ He argues that creativity, the confluence of different intelligences, is contextual. It is a quality we all have, which emerges for individuals over time and in certain domains or within certain projects.²⁴ For example, some of us might be creative in the business arena, while others might be creative in their interactions with children.

Lawyers tend to favor linguistic and mathematical-logical intelligences – speech, the written word, and logical reasoning. We can expand our creative thinking processes by developing other more nascent intelligences, such as our intrapersonal intelligence, in order to deal better with our clients; our intrapersonal, and spiritual intelligences, in order to get a better perspective on our legal careers, and

²² Guilford, *supra* note 22, at 43.

²³ HOWARD GARDNER, INTELLIGENCE REFRAMED: MULTIPLE INTELLIGENCES FOR THE 21ST CENTURY 41-43 (1999). Gardner also considers adding to his set natural, spiritual, and existential intelligences. *Id.* at 47-77.

²⁴ *Id.* at 116-119; Becca Solomon, Kimberly Powell, and Howard Gardner, “Multiple Intelligences” in 2 ENCYCLOPEDIA OF CREATIVITY 273-83 (Mark A. Runco & Steven R. Pritzker eds., 1999).

our spatial intelligence, in order to gain a different perspective on specific legal problems.²⁵

Individuals who have conceptualized the creative thinking process have varied their nomenclature for describing what it is. Nonetheless, all seem to agree that creative thinking is a dynamic process, not attributable solely to genetic intelligence, but rather a process that can be learned over time. An examination of the various definitions of creative thinking demonstrates that traditional legal education does not utilize this process on a regular basis. If we expect to train lawyers who are effective creative thinkers, then we have to both appreciate its role in problem solving and have some understanding of how the process occurs. Creative thinking is available to us if we have the motivation to develop it. A better understanding of how the brain functions provides the foundation for creative thinking.

II. THE BRAIN'S ROLE IN CREATIVE THINKING

In this part we discuss two perspectives for thinking about brain processes: Cognitive theory and Hemispheric Specialization. Cognitive theory provides the foundation for the idea that creative thinking is a learned process, which, when combined with our more linear thinking, enhances our thought processes. Hemispheric Specialization explains how the different functions of the two sides of the brain work together to solve problems. In addition to presenting these perspectives, each part examines how the definitions of creative thinking, as discussed in the previous part, make sense in light of what we know about the brain.²⁶

A. Cognitive Theory

From the time an infant is born, experience works upon the billions of neurons in the brain to form synaptic connections that deter-

²⁵ For further discussion of Howard Gardner's work the need for law schools to encourage a multiplicity of intelligences, see Andrea Kane Kaufman, *The Logician Versus the Linguist-An Empirical Tale of Functional Discrimination in the Legal Academy*, 8 MICH. J. OF GENDER & THE LAW 247 (2002) (discussing the benefits to students when cases are taught from a multiple intelligence perspective); Carrie Menkel-Meadow, *Aha? Is Creativity Possible in Legal Problem-Solving and Teachable in Legal Education*, 6 HARV. NEGOT. L. REV. 97, 114-119 (2000); Ian Weinstein, *Testing Multiple Intelligences: Comparing Evaluation by Simulation and Written Exams*, 8 CLIN. L. REV. 247 (2001).

²⁶ Not being experts on brain functioning, we present here a very basic framework. We are mindful of the complexity of the processes that we have greatly simplified. This is not the place for a discussion of the way synapses work, the chemical and electrical processes that are involved in brain development, or the disputes among brain scientists regarding all of these matters. Our intention is to provide a framework for considering creative thinking, hopefully, to convince those who need to be persuaded that it is a goal that can be achieved only with intention and understanding.

mine thoughts and behavior.²⁷ Experience and genes continue to determine the functioning of the brain throughout life, with particular synaptic connections being strengthened and becoming dominant while others recede in importance for lack of use.²⁸ The resulting “structures,” or pathways, provide coherence to our worlds, our concepts of reality,²⁹ which are reinforced by the selective perception of information from our environment that generally fits our existing sense of reality.³⁰ The development of the brain continues throughout life as we engage in new activities and experience new environments.³¹

One of the functions of the brain is to process information in such a way as to form patterns.³² Without this self-organizing patterning system the stimuli entering the brain would be impossible to manage.³³ For example, when we see something with four legs and fur, and that thing is barking, we will see it as a dog. On a different level, the law and legal training use pattern identification in relying upon analogy, precedent and the concept of causes of action to select, organize and think about information when solving a problem. When someone has been injured, we think of legal solutions using patterns from torts and criminal law.

Thus, the information we perceive is, at least in part, determined by what our brains are trained to notice through our experiences.

²⁷ See DANIEL J. SIEGEL, *THE DEVELOPING MIND: TOWARD A NEUROBIOLOGY OF INTERPERSONAL EXPERIENCE* 13-14 (1999).

²⁸ *Id.*; see also BRYAN KOLB & IAN Q. WHISHAW, *FUNDAMENTALS OF HUMAN NEUROPSYCHOLOGY* 500 (4th ed. 1996).

²⁹ For a general review of the neuropsychology of the developing mind, see Janet Weinstein & Ricardo Weinstein, *Before It's Too Late: Neuropsychological Consequences of Child Neglect and Their Implications for Law and Social Policy*, 33 U. MICH. J.L. REF. 561, 596 (2000). It should be noted that pathways that produce ideas are not simple chains of neurons, but are actually circuits of connected neurons that interact given appropriate stimulation.

³⁰ See Ward et al., *supra* note 8, at 11 (discussing how we are constrained by prior knowledge).

³¹ See QUARTZ AND SEJNOWSKI, *supra* note 5. “In partnership with precisely timed developmental programs, the world helped construct your mind’s circuits when you were growing up, and it continually reshapes them as you experience new things and call on new skills. Moreover, this process doesn’t end at adulthood. The world stirs the chemical soup inside your head throughout your life.” *Id.* at 27.

³² See, JOAQUIN M. FUSTER, *CORTEX AND MIND, UNIFYING COGNITION* 59 (2003). Perception is the classing of the world into categories. Discrimination is the reclassing and decomposition of sensory information. Attention is the focusing on a class or subclass of motor information. All our memories are categorized by content, by time, by place, and so on. Reasoning and intelligence are closely dependent on the proper categorization of phenomena, external and internal.

³³ See PAUL E. PLSEK, *CREATIVITY, INNOVATION AND QUALITY* 40 (1997) and DE BONO, *SERIOUS CREATIVITY*, *supra* note 6. “[T]he brain is a wonderful device for allowing incoming information to organize itself into patterns. Once these patterns are formed, with their broad catchment areas, we use those patterns in the process known as perception.” *Id.* at 15.

Once the information is received, its processing will generally follow established pathways. As an example of this, consider cars. If you are on the road you may see many types of cars, but not necessarily notice any particular car. However, if you have just bought a car, you will tend to notice cars like yours more frequently. This may also explain why we can often predict the way someone we know is going to behave, and how that person can predict how we are going to react to their behavior.³⁴ We have a tendency to react in similar ways to particular stimuli. This is an important quality, for it allows us to anticipate the consequences of our behavior and to make thoughtful choices. However, repeated reinforcement of the same thinking strategy also creates thinking “ruts.”³⁵ Over time the more frequently used pathways become the processes that are most relied upon when a person is presented with new challenges. The more we do something, the stronger or more dominant we make the pathways; the more ingrained the thinking pattern, the “deeper” the “ruts” in our minds become.³⁶ Thus, our judgments become biased toward the status quo; essentially we can become “stuck in a rut.”³⁷

At the same time, these self-organizing patterns of the brain are the cognitive structures we use to generate new thoughts.³⁸ Cognition, the actual thinking process, is generative even in the absence of conflicting ideas.³⁹ When we perceive new information, we form “new concepts, or modify or extend old ones.”⁴⁰ New thoughts arise from

³⁴ See ALLEN F. HARRISON & ROBERT M. BRAMSON, *STYLES OF THINKING: STRATEGIES FOR ASKING QUESTIONS, MAKING DECISIONS, AND SOLVING PROBLEMS* 6 (1982).

Our preferences for one or more sets of thinking strategies dictate our approach to problems, and to a great extent our behavior generally. Our preferences form the basis of our unique ability to handle tough problems and to meet the requirements of specific situations. They also lead us to mistakes and incompetence when the preferred approach doesn't work.

Id. Authors label styles of thinking in different ways, but each of these models is based upon the foundational concept of patterned thinking.

³⁵ See PLSEK, *supra* note 33, at 40.

³⁶ Plsek describes de Bono's river and topography model of the mechanism of the mind, demonstrating that “memory is a mental rut.” PLSEK, *supra* note 33, at 40. “The more frequently we access the memory, the deeper the rut.” *Id.*

³⁷ PLSEK, *supra* note 33, at 49; DE BONO, *SERIOUS CREATIVITY*, *supra* note 6, at 15. It is important to keep in mind that, while these “ruts” can be problematic when we are attempting to find a creative answer to a problem, they are essential to our everyday functioning. It is this ingrained process that allows us to engage in behaviors such as driving a car, or reading an appellate opinion, without having to consciously consider each of the many tiny steps that are actually involved in that activity.

³⁸ Ward et al., *supra* note 8, at 1. The process of forming new concepts is creative because it builds new and useful cognitive structures in the brain. “Hence, at its core or essence, the continual growth of categorical and conceptual knowledge is in itself a creative phenomenon.” *Id.* at 3.

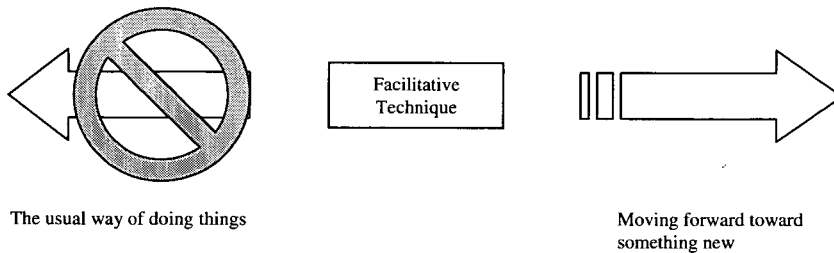
³⁹ *Id.* at 1.

⁴⁰ *Id.* at 3. The explicit use of cognitive processes in creative thinking is known as “crea-

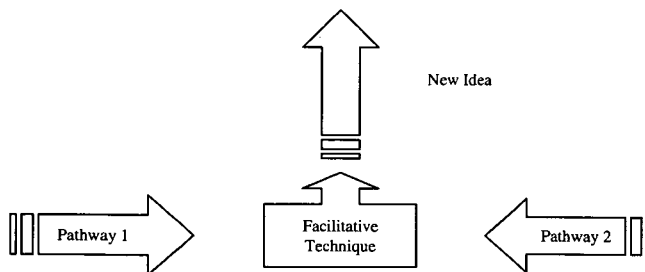
combinations of thoughts that already exist in the brain.⁴¹ These new thoughts, in turn, add to brain functioning and will influence future perception. This added functioning, is the foundation for the creative thinking process. In other words, we begin with what we have, and expand upon it.

All of the definitions of creative thinking discussed in Part I can be visualized using this basic information about brain functioning. The processes embodied in the definitions of creative thinking require some sort of intervening facilitative technique or experience to trigger their operation. Examples of facilitative techniques are discussed in Part III.

Forward thinking, resisting the tendency to fall back on the usual ways of considering a problem, might be seen as follows:



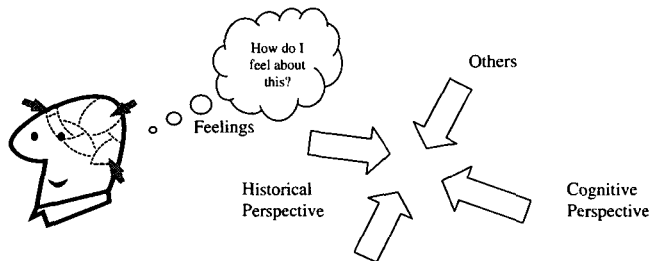
Epstein's theory of generativity is based upon the notion that a problem presents a situation where a conflict arises from the processing of two or more useful pathways. This conflict can be the source for the generation of a new pathway if facilitative techniques are applied by the problem solver. Epstein's generativity model can be visualized as two pathways coming into conflict and necessitating the creation of a new pathway as follows:



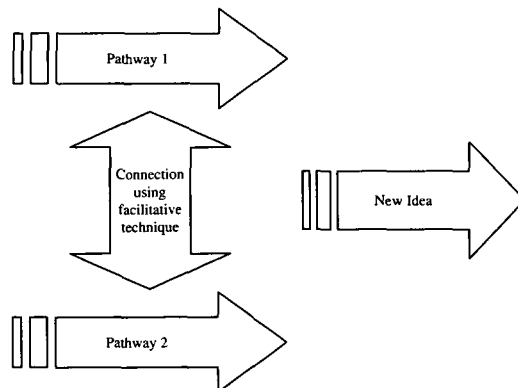
tive cognition." *Id.* at 4.

⁴¹ *Id.* at 6 ("Much creativity results from simultaneously holding in mind two opposing concepts."). "Creativity may . . . be thought of as the entire system by which processes operate on structures to produce outcomes that are novel but nevertheless rooted in existing knowledge." *Id.* at 18-19.

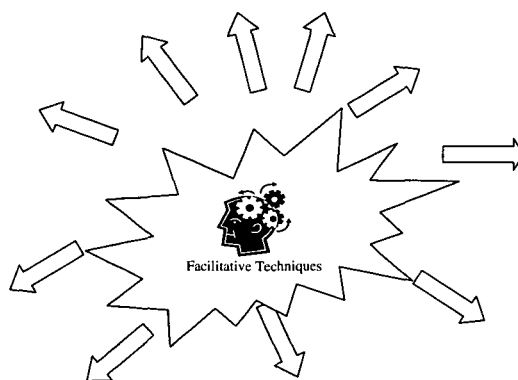
Eiffert's whole-brain thinking, like the other definitions, includes the implicit requirement that some conscious effort be made to accomplish it. The effort would include conscious inclusion of aspects of the problem that would not ordinarily be considered, such as the emotional effects a particular case might have on our students (which might be preventing them from understanding the underlying law). It could also include working with others who think differently from us, including people trained in other disciplines.



Likewise, de Bono discusses jumping from one pathway to another (a lateral rather than a linear move) to create new connections that may solve a problem. de Bono's lateral thinking concept can be visualized as follows:



Guilford's definition of creative thinking as divergent thinking means that we have to expand our repertoires and not engage in constrictive thinking processes. It is illustrated as follows:



Thus, by exposing ourselves to new information and new problems, we generate new “memories” in our brains, helping us to better function in our world.⁴²

Because our brains tend to resist changes in thinking patterns, the process of thinking creatively – creating new patterns – can be difficult.⁴³ One example of this conceptual inertia is curricular reform in legal education; we have a hard time moving away from what we know and already do.⁴⁴

Professional education, by its very nature, digs deep ruts. Professional training prepares a person to examine a problem by specific criteria and to find solutions from an established “database.”⁴⁵ Physicians are trained to look for particular symptoms in diagnosing a problem, to label the problem, and to provide the professionally accepted treatment for that problem. Similarly, in law school we train students to look for “relevant” facts, to label the problem, and to provide the professionally accepted solution – a determination of the merits of ap-

⁴² *Id.* at 4. There is some disagreement as to how much plasticity the brain has past childhood, see *infra* note 48, but there is no question that people continue to learn and that the learning process keeps the brain active and healthy. “Although genetics undoubtedly plays a role, . . . ‘keeping the brain active and performing whatever tasks are needed to maintain intellectual vitality can increase the chances for optimum functioning.’” RICHARD RESTAK, *THE SECRET LIFE OF THE BRAIN* 155 (2001) (quoting Denise Park, a research scientist at the Center for Aging and Cognition at the University of Michigan in Ann Arbor).

⁴³ Ward et al., *supra* note 8, describe the nature of thinking to be similar to that of physical objects governed by the laws of physics. As physical objects resist change, so do ideas, tending to change slowly and incrementally, and particularly resisting change in direction. *Id.*, at 22-23 [cites omitted].

⁴⁴ See generally John O. Mudd, *Academic Change in Law Schools*, 29 GONZ. L. REV. 29 (1993/1994).

⁴⁵ See Janet Weinstein, *Coming of Age: Recognizing the Importance of Interdisciplinary Education in Law Practice*, 74 WASH. L. REV. 319, 354 (1999) (professions are cultures in themselves with their own set of values, knowledge, language, skills, and institutions; the purpose of professional training is to embed these cultural characteristics).

plying a particular law or legal theory. The outcome is arrived at through a linear process that includes application of law to a set of facts as well as the thought processes of analogy and distinction. This determination is then translated into an action plan that might be a mediation, a negotiation, a lawsuit, or a transactional document. When the facts presented do not fit neatly into one of the profession's established categories, or when the outcome will not be satisfactory, something new is required.

As legal educators, we follow similar principles. We frequently prepare to approach a "problem," such as teaching a particular subject area, by looking to see what has been done in the past. Published casebooks and teachers' manuals make it easy for us to take this path. When the chosen path does not produce the desired result (the students are not "getting it," they are uninterested, or we are bored), we look for something new.

The law, itself, follows the same principles. When a problem arises, the law looks to solutions that have worked in the past and then attempts to fit the current situation into one of those solutions (i.e., precedents). Where the fit is not just or where two or more precedents collide, new law is created. This dialectic approach closely resembles generativity theory.

In all of the above situations, though, we resist change. Understanding that the brain functions by using its accustomed pathways explains why change seems to take such effort. Without the assistance of techniques and an environment that nurtures the thinking process, attempts to come up with new ideas can be frustrating and uncomfortable.

In addition to an understanding of how thought pathways are developed, it is also helpful to have some understanding of the fact that particular areas of the brain tend to specialize in specific functions, and the importance of the interactions between these different kinds of thinking. These topics are the subject of Hemispheric Specialization theory.

B. Hemispheric Specialization Theory

The theory of hemispheric specialization has its roots in right-left brain theory. Emerging knowledge of the organization and functioning of the two hemispheres led in the 1970s to the notion that people can be divided into "right" and "left" brain types. Right-left brain theory posits that some tasks essential to creative thinking are primarily right-brain functions (perception and discrimination of emotion, receiving and conveying information in narrative, creative generation

of hypotheses).⁴⁶ The right hemisphere also performs the global processing that is necessary to understanding context of problems and solutions.⁴⁷

However, this theory of strict lateralization of brain functions has been discredited as oversimplified. Studies that led to right-left brain theory were primarily the result of experience with brain-damaged individuals. In those cases, the effects of the damage seemed to suggest that the brain hemispheres were specialized to a degree that research does not support.⁴⁸ More sophisticated understanding of brain anatomy and functioning has demonstrated that both hemispheres, when undamaged, work together in harmony and are essential to creative thinking.⁴⁹

Nonetheless, it is true that the hemispheres have areas of specialization.

[E]ach hemisphere encodes different aspects of the world according to its own specialized manner and communicates that information to its partner. Things are perceived and analyzed as a whole by the right hemisphere, whereas the left hemisphere breaks things down into their components. The right hemisphere excels at reading maps, working out jigsaw puzzles, copying designs, distinguishing and remembering musical tones, recognizing faces, analyzing other people's emotions via the interpretation of their tones of voice or facial expression (essentially the reading of "body language"), visualizing in three-dimensional space, and other activities involving perceptual spatial relations. In addition to language, the left hemisphere is involved in all other activities that involve analysis or sequential processing.⁵⁰

⁴⁶ Strong, *supra* note 1, at 775. See also MARILEE ZDENEK, *THE RIGHT-BRAIN EXPERIENCE: AN INTIMATE PROGRAM TO FREE THE POWERS OF YOUR IMAGINATION* (1983) (describing the specialized tasks usually performed by each side of the brain).

⁴⁷ Strong, *supra* note 1, at 785.

⁴⁸ "Such teachings ignored the fact that, except under the rare and unnatural conditions of a split-brain operation, we possess two integrated hemispheres that are in constant two-way communication with each other across the corpus callosum. And although it is true that some people's thought patterns and behavior seem more expressive of one hemisphere than the other (lawyer, left, versus potter, right), this does not imply that such individuals are not using both brain hemispheres . . . [W]e possess a *unified* brain." RESTAK, *supra* note 42, at 102. See also A. R. LURIA, *THE WORKING BRAIN: AN INTRODUCTION TO NEUROPSYCHOLOGY* 72 (1973) (thinking activity relies on combined working of a complete system of cortical zones).

⁴⁹ See RESTAK, *supra* note 42, at 93. "[T]he brain consists of ever-changing pathways of relationships. This means that information is not localized into neat pigeonholes but is distributed throughout its 50 billion neurons." See also EIFFERT, *supra* note 6, at 58-60 (discussing the importance of using both hemispheres in our thinking).

⁵⁰ RESTAK, *supra* note 42, at 97-98. "For the lawyer, abduction describes the creative form of reasoning required to see the hypotheses that are not apparent." Strong, *supra* note 1, at 791.

At every moment in the normal brain, the two hemispheres are receiving the same stimulus but extracting different information from it. Each hemisphere is processing not only its own sensory information at all times, but also the results of the other hemisphere's processing of the same information.⁵¹

In short, neither hemisphere provides a "truer" version of reality but, rather, different though complementary aspects of it. The brain has evolved into an inherently dialectic organ that attempts during every moment of its existence to achieve a unification of opposites. One hemisphere acts as a corrective for the other. Both the words *and* the underlying tone of voice are necessary in order to arrive at the meaning of a particular utterance.⁵²

For example, as we watch someone sing a song, our right hemisphere notices the melody, the emotional nuances of the song, and the facial expressions of the singer, while our left-hemisphere analyzes and interprets the words to the song. These seemingly distinct tasks are not experienced by us as separate events, but are blended together into a single experience. If we consciously focus on any of the specific aspects, we can bring it to the forefront while the other aspects of the event recede into the background. The fact that we can do this demonstrates that we are capable of shifting our mental processes to attend to an activity in which one side of the brain is more dominant.

This is particularly significant when we are attempting to think creatively, as the dominance of left hemisphere thinking in most people requires special effort to allow equal attention to the right hemisphere's work.⁵³ In the legal environment, left-brain processes are

⁵¹ See RESTAK, *supra* note 42, at 100.

In collaboration, operating on the same information from the same world of real life experiences, the two hemispheres are able to build up representations that are far more complete, veridical, and rich in information than would be possible for either hemisphere alone or for two hemispheres that were functional clones. By virtue of the enormous information carrying capacity of the corpus callosum, the power and generality of these mental models extend over the whole domain of experience, not just the portion that is the province of one or the other hemisphere. *Id.* (quoting Jerre Levy but source of quote unknown).

⁵² *Id.* at 101. See also LURIA, *supra* note 48, at 72-73.

[H]uman gnostic activity never takes place with respect to one single isolated modality (vision, hearing, touch); the perception – and still more, the representation – of any object is a complex procedure, the result of polymodal activity, originally expanded in character, later concentrated and condensed. Naturally, therefore, it must rely on the combined working of a complete system of cortical zones.

For a detailed description of the thinking process involved in problem solving, see *id.* at 327-329.

⁵³ Women tend to use both hemispheres in concert more so than men, who tend to isolate disparate functions and activities into smaller areas of individual hemispheres. Women's brains do more synthesizing, while men's do more compartmentalizing. EIFFERT, *supra* note 6, at 59. Some have posited that this is because the corpus callosum in women

particularly dominant, evidenced by our tendencies to criticize ideas during the initial phase of problem solving. The left brain dominance must recede so that the right brain's contribution can be realized. Nourishing our right brain activity can be a difficult task because the left brain's tendency to find conceptual patterns is so strong.⁵⁴ New ideas that might arise during the initial stages of problem solving might not fit into existing conceptual patterns, and thus be rejected.

Hemispheric specialization theory is useful in thinking about the many different functions we employ in problem solving in the legal context. The job of helping people solve problems is not purely one of analyzing a set of facts and deciding what law applies. Neither is it solely, or in addition to the above, a matter of making logical arguments about why a particular precedent should apply to a set of facts.⁵⁵ From an initial contact with a client, where the development of rapport and the ability to discern emotional content and innuendo are both required, throughout the problem solving venture (in a litigation scenario, investigations, negotiations, trial preparation and presentation; or, in the case of transactional work, collaboration and imagination), this interaction of both hemispheric functions is essential.⁵⁶

is thicker than in men, thereby allowing more efficient transferring of information between the two hemispheres. See KOLB & WHISHAW, *supra* note 29, at 217 (discussing research in this area); Ralph L. Holloway et al., *Sexual Dimorphism of the Human Corpus Callosum From Three Independent Samples: Relative Size of the Corpus Callosum*, 92 AM. J. OF PHYSICAL ANTHROPOLOGY 481, 491 (1993) (relative to brain size, the female corpus callosum appears to be significantly larger than that of males).

⁵⁴ See EIFFERT *supra* note 6, at 18-20. "In our society, the logical, linear skills of the left brain are highly valued, while the more intuitive, artistic skills of the right brain are greatly neglected. The imaginative powers of the right hemisphere have all but atrophied in a high percentage of the adult population; it is possible, however, to develop latent abilities of the right side of the brain by special mental exercises." ZDENEK, *supra* note 46, at 4.

⁵⁵ Our interns expressed these thoughts in response to reading Janeen Kerper, *Legal Education: Creative Problem Solving vs. The Case Method: A Marvelous Adventure in Which Winnie-the-Pooh Meets Mrs. Palsgraf*, 34 CAL.W.L.REV. 351 (1998). "[C]lients are real people with real problems. Not that I didn't realize this before, but law school doesn't really make a great effort to sensitize you to your clients' needs Why does law school do this to people, take the heart out of the story to force you to learn the law?" (comments of student intern). "Appellate cases are much different than a real-life client. I really liked how Professor Kerper said that emotion is consciously repressed in favor of a detached analysis. This is SO true. Two weeks ago in my tutoring session, one guy commented that he was appalled by the Keeler case (the case where the man beat his pregnant wife and kicked her in the stomach to kill the baby). I remember how appalled I was; I could hardly get through the case. Yet, no one in the class expressed any disgust as to the facts of the case, and my tutee was horrified. I remember I was too. All you talk about in class as a law student analyzing the case is 'here is the addition of fetus in the definition of murder (the unlawful killing of a human being or fetus).' Absolutely no emotion whatsoever." (comments of another student intern)

⁵⁶ "One or other of the hemisphere's operations can be favored at different times and

Whether a particular function is located in one hemisphere or in many cooperating areas of the brain is not necessarily important to creative thinking. What is important is our understanding that all the functions are important and that they interact.

Understanding that creative thinking involves the resuscitation of dormant pathways, the development of new connections, and the nourishing of our right brains to provide greater “whole brain” collaboration, we turn to the question of how this resuscitation, development and nourishment might occur. The following part provides specific techniques to encourage these processes. Part IV discusses the elements necessary to allow our creative thinking to flourish. With these techniques and components in mind, we conclude in Part V with some thoughts as to how we might use them in the law school environment.

III. TECHNIQUES FOR FACILITATING CREATIVE THINKING

There are a number of techniques that we can use to shift our focus and jump out of our rut in order to think more creatively about problems. Many of these techniques involve looking at the problem in a different context and/or redefining the problem.⁵⁷ They may be used by individuals, or in group settings.⁵⁸ Below we describe the techniques, and illustrate how we might use them in a professional context. The underlying theory of these techniques is that they serve to expand the neurological pathways our brains typically use and encourage the interweaving of both hemispheres of the brain, as explained in the previous part.

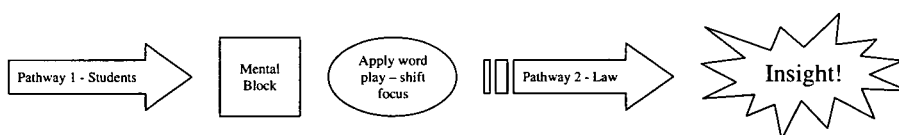
under certain conditions. In a courtroom the jury is instructed to decide strictly on the basis of logic, as developed via verbal reasoning, the determination of whether one side has made its “case.” Reliance on intuition or on such things as reading the “body language” of the various participants is forbidden – an injunction that if adhered to effectively eliminates the contributions of the right hemisphere.” RESTAK, *supra* note 42, at 101. At the same time, finders of fact are entitled to determine which witnesses they will believe and to discredit testimony from witnesses they do not find credible. Right-brain hemisphere activity interpreting body language, tone, and emotional content is an inherent component of such decision-making.

⁵⁷ For a additional discussion of various techniques used to achieve creativity, see Thomas Michael McDonnell, *Playing Beyond the Rules: A Realist and Rhetoric-Based Approach to Researching the Law and Solving Legal Problems*, 67 U.M.K.C. L. REV. 285, 306-11 (1998) (discussing different ways to get at creativity – random stimulation, reverse thinking, brainstorming, etc.); see also Kimberly E. O’Leary, *Using “Difference Analysis” to Teach Problem-Solving*, 4 CLINICAL L. REV. 65 (1997) (discussing use of brainstorming as a technique to teach students to consider different perspectives on a problem, *id.* 84-85, or to develop fact theories and legal theories of a case after interviewing clients, *id.* at 94).

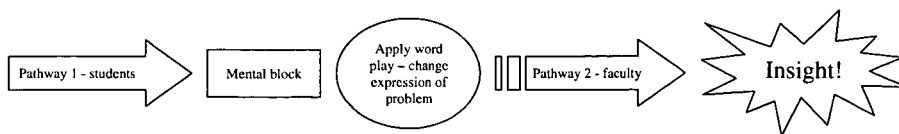
⁵⁸ When we consider how to think creatively, one thing that tends to come to mind is brainstorming. Brainstorming is actually not a creative thinking technique, but rather a group process that can be used with different techniques, such as those set forth in this part.

A. Wordplay

Changing the emphasis or focus of the issue helps to alter the lens through which we view a problem. One can do this by choosing a different focal point for the problem.⁵⁹ For example, if we are concerned about how to better help our students become creative problem solvers, instead of viewing the problem as our law students' lack of *creativity*, we might view it as our *law* students' lack of creativity. In other words, perhaps there is something in the discipline of learning about the law that is lacking in creative thought. Or, perhaps it is *our* law students' lack of creativity; is there something about our individual institution that lacks creativity? In terms of brain processes, this shift in focus causes us to move from one pathway to another. Continuing to move down the same pathway, i.e. how can we get our students to become more *creative*, might lead us nowhere and be frustrating. Shifting to another pathway might provide insight that would not have been possible by staying on the first pathway. This process would look as follows:



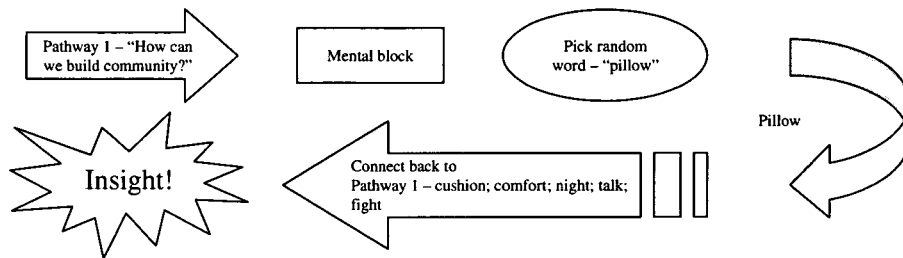
Another technique to inspire creative thinking is to change how we express the problem. For example, if we change "students" to "faculty" in the above problem description, the problem takes on a different focus. Perhaps we should first train ourselves as creative thinkers before we think about training our students. Or, if we take out the word "law", we see the problem more broadly. Perhaps our system of Western education is patterned too greatly on convergent thinking. Or perhaps other disciplines do more to encourage creativity than we do in legal education. In the context of brain functioning, this achieves the same result as shifting focus – it takes us to another pathway. This technique is graphically expressed as:



Or, we might add new words, not generally associated with the

⁵⁹ PLSEK, *supra* note 33, at 59, discusses this technique as simply "redefining the problem"; see also EIFFERT, *supra* note 6, at 42-45, 70-74, 160-165.

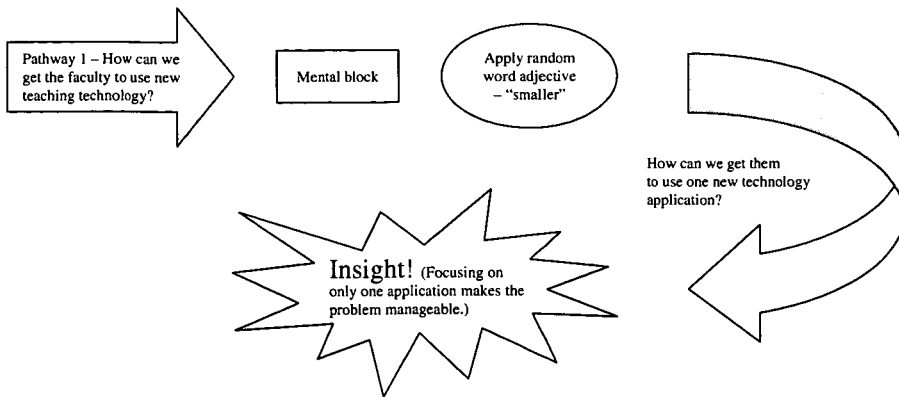
problem through a technique called “random word association.”⁶⁰ For example, in dealing with the problem of creating community at school after admitting an unexpectedly large first-year class, we might randomly choose the word “pillow” and associate it with the problem as follows: Pillow – cushion (enhance the student lounge area); pillow – comfort/relaxation (make students more comfortable by making efforts to be welcoming and not threatening); pillow – talk (create more intimate seating areas at the school); pillow – night (extend classes into the evening so there are not so many students on campus at one time); pillow – fight (provide opportunities for games that create community spirit). Graphically, this is represented in brain functioning as follows:



Another random word method is to associate the problem with certain adjectives, which also aids in context-shifting.⁶¹ For example, the problem solvers could analyze the problem by making it **SMALLER**. If the problem is that the faculty is resistant to using new teaching technology, the problem can be made smaller by focusing on one particular application of new technology. Whereas the first articulation of the problem might seem overwhelming, it is much easier to develop a strategy to indoctrinate the faculty in one new application. The graphic representation of this technique is:

⁶⁰ PLSEK, *supra* note 33, at 42, 247-267.

⁶¹ *Id.* at 54.



These techniques force the mind to “jump across” its usual pathways (mental ruts), or to make new connections between old pathways in order to create a new idea out of two seemingly disparate ideas. These techniques are described by de Bono as prompts for lateral thinking.⁶²

B. “Six Hats”

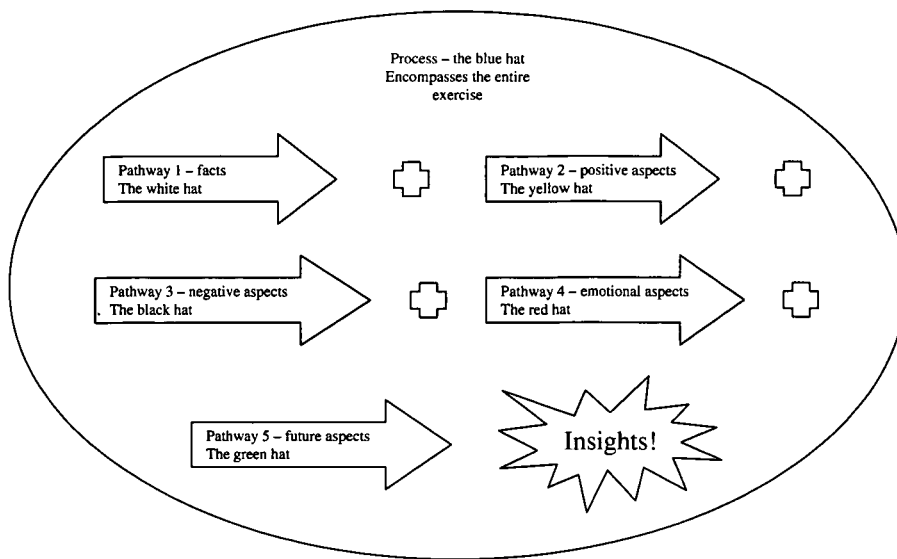
Edward de Bono, in his Six Hats thinking process, isolates aspects of a problem and addresses each separately. Each aspect is represented by a color: red for emotions, white for facts, yellow for positive, green for future, black for critique, and blue for process.⁶³ His theory is that the symbolic act of donning different colored hats allows the problem solvers to explore each aspect of the problem separately, without bias or interference.⁶⁴

For example, lawyers and law faculty have the tendency to immediately critique ideas with our black hats; if we first explore the emotional aspects of an issue (red hats), it is easier to separate our anger or other feelings from other components of the issue. Or, it might be best to first explore the positive aspects of the problem (yellow hats), if we are dealing with a problem that seems to be very negative. It is often good to start with the facts (white hats). This process can be graphically demonstrated as:

⁶² See generally DE BONO, *SERIOUS CREATIVITY*, *supra* note 6.

⁶³ EDWARD DE BONO, *SIX THINKING HATS* (1985).

⁶⁴ *Id.*



This process allows greater clarity in the problem solving process, because aspects of a problem that might otherwise taint the problem solving, such as one's feelings regarding the issue, are surfaced and categorized. The separation of facts from underlying biases and concerns, for instance, may bring insight that can help us jump out of a rut. We can use the Six Hats process to get through writing blocks in our legal scholarship. Going through the various steps, particularly focusing on the emotional aspects (putting on the red hat) of the subject matter, may help to clarify the topic and provide direction.

As discussed earlier, the mind chooses to travel down well-worn pathways. A conscious effort to focus on the less traveled pathways is required. The Six Hats process forces the participants to focus on one pathway (used here loosely in the sense of "train of thought") at a time. In this way the dominant thinking mode and thoughts do not drown out the weaker pathways, allowing a wider range of considerations to be brought to resolving the problem. Because the usual filtering of elements that would otherwise be perceived as irrelevant by the dominant pathway does not occur, the availability of this wider range of information makes possible a creative combination of existing ideas.

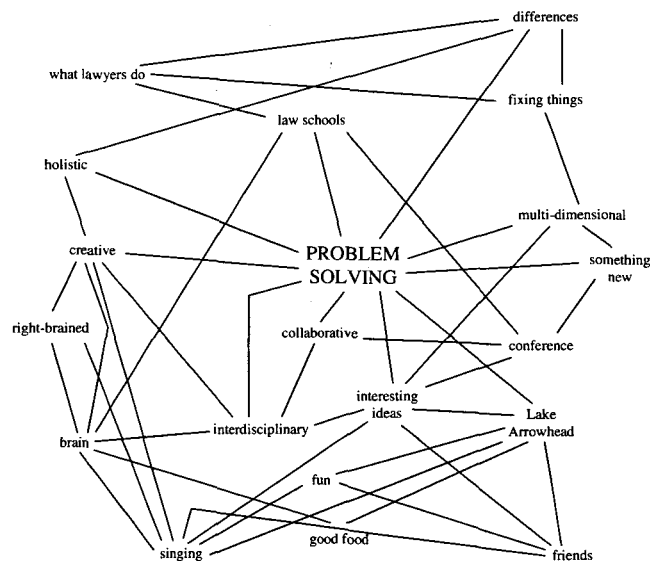
C. Mind-Mapping

Word clustering, also known as mind-mapping, is a related method of word association.⁶⁵ The problem solvers write the problem

⁶⁵ TONY BUZAN, *THE MIND MAP* (1996); EIFFERT, *supra* note 6, at 74.

out and then write down words that come to mind, randomly, as related to the problem. The words are written without any particular order all over a paper, and once that aspect is completed, lines are drawn connecting the words as connections come to mind. The brain function explanation for this technique is that, because there is no pre-defined logic to the way words are selected, the brain is free to come up with words without editing. Thus, words may come from many different pathways where some association with the problem is located. Once all of these pathways are expressed on paper, the brain continues the unedited process of finding connections between the various concepts; often more than one of these connections results in a creative idea.

Mind mapping is a useful technique for exploring research ideas. We used mind-mapping to design this topic for the International Clinical Conference at Lake Arrowhead. We began by writing "Problem solving" in the center of the paper. From there, we wrote ideas such as: "fixing things"; "what lawyers do"; "differences?"; "holistic"; "interdisciplinary"; "collaborative"; "brain"; "thinking"; "logical"; "right-brained"; "creative"; "multi-dimensional"; "skills"; "law schools"; "environment"; "resources"; "conference"; "Lake Arrowhead"; "friends"; "fun"; "good food"; "interesting ideas". It looked something like this:



After writing down all the thoughts that came to mind in considering what to write about problem solving, the connection proceeded as follows: "we want to do something different"; "what if we look at

how the way the brain works affects problem solving?"; "since we're dealing with the brain, let's look specifically at the creative thinking process"; "we can use the information we have from other research on brain development, so it will be interdisciplinary"; "we can look at what it takes to do creative thinking and whether it is different in legal problem solving than in other areas"; "we can also look at whether law schools are providing what is needed to encourage creative thinking."

D. Visualization

Visualization is another method to enhance our creative thinking.⁶⁶ Focusing on visual stimuli rather than abstract ideas brings to the fore another set of pathways that may otherwise be suppressed in favor of the dominant mode of thinking. One can engage in visualization simply by shutting one's eyes and thinking about the problem. One might think about, for example, what it looks like to have the problem solved, and come up with new ways to solve it. Or, one might look at the problem from above, and see things otherwise invisible. Law professors might use visualization to help explain legal concepts. For example, in order to explain the difference between the search of a home and the search of a car, a Criminal Procedure professor might seat students in the front of the class, as if they were in a car. Other students could perform the search of the car to illustrate more graphically what goes on, and why our rights to privacy might be different as applied to automobiles. This technique encourages our more spatial, tactile right brains to collaborate with our left, thereby awakening unused pathways.

The visualization process can be graphically portrayed as follows:



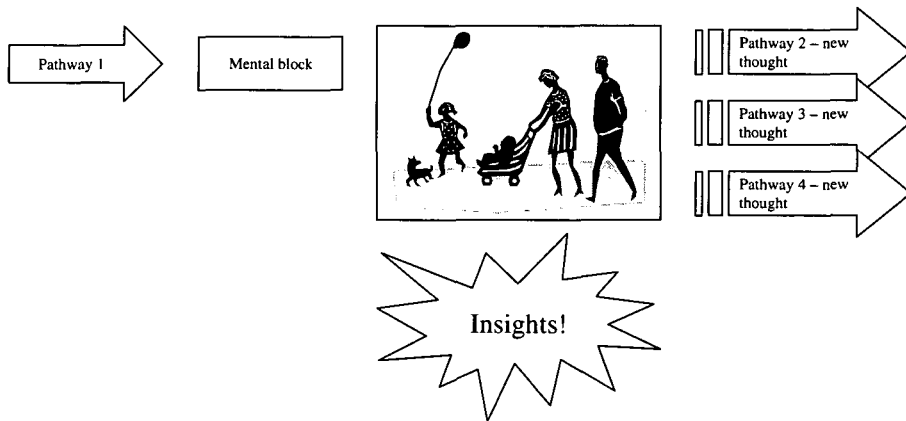
E. Incubation/relaxation

Another technique helpful throughout the process of creative thinking is incubation, or mind relaxation. For example, de Bono would label as "the creative pause," activities such as taking a shower, working out, or taking a walk.⁶⁷ Essentially, we depart from our intense focus on a problem, and do something different, in order to "in-

⁶⁶ PLSEK, *supra* note 33, at 247-267, discusses this in terms of "Cinematics."

⁶⁷ DE BONO, *SERIOUS CREATIVITY*, *supra* note 6, at 86.

cubate” our ideas.⁶⁸ The idea is to relax one’s mind, or even “play,” in order to let creative processes flow more freely.⁶⁹ From a brain functioning perspective, this process operates as a combination of some of the techniques mentioned above. First, removing the pressure to find the answer allows the focus to recede from the pathway that has proven to be a dead-end. Second, when no immediate goal is forcing the brain down a particular path, it is free to allow other thoughts to emerge; some of these thoughts will most likely be related to the problem that has been the focus of thought. Finally, incubation can stimulate some of our right brain senses, as we smell, touch, or taste our new surroundings. Graphically, this might appear as:



Similar to the incubation process is the process of stimulating our brains by surrounding ourselves with new objects or new people.⁷⁰ As law professors, we do this by teaching a new course, attending conferences, engaging in pro bono activities, teaching with faculty of diverse backgrounds, taking sabbaticals, or involving ourselves with interdisciplinary work. New objects and people may present new ideas, actually creating new thoughts/pathways. We may make use of these new ideas by finding direct or indirect connections that help us see our

⁶⁸ See, e.g., PLSEK, *supra* note 33, at 46. The incubation process is actually one of the necessary steps in creative thinking. It follows preparation (learning the knowledge and skills) and is the process in which the brain is doing something with the knowledge and skills. At the end of the incubation period comes illumination. See Heilman, *supra* note 15. See also, KOESTLER, *supra* note 10, at 193.

⁶⁹ EIFFERT, *supra* note 6, at 165, or 70-74. Eiffert’s work focuses on the left brain/right brain differential. According to Eiffert, playfulness helps stimulate the right hemisphere, thus allowing the brain to see new patterns. Although we must concentrate on a problem initially to prepare our minds, insight frequently comes when the brain is preoccupied with something other than the immediate problem. *Id.* at 55-57. Plsek also encourages us to “examine ideas that make you laugh.” *Supra* note 33, at 54.

⁷⁰ See EPSTEIN, GAMES, *supra* note 13, at 51-60.

problems in a new way. A direct answer would be learning how to solve the problem from someone who has successfully solved the same problem in the past. An indirect answer might be that the new information we acquire is then used in the processes mentioned above to create a new combination or connection between ideas.

While each of the techniques described above might stimulate or facilitate creative thinking, the techniques alone cannot be effective unless they are applied under conditions that encourage creative thinking. Creative thinking depends upon the availability of a number of factors or conditions that combine to allow it to flourish. In the presence of these conditions, one can employ any of the above techniques to further encourage creative thinking. The following part discusses these factors, their relationship to brain functioning, and their status in legal education.

IV. FACTORS CONDUCTIVE TO CREATIVE THINKING

Many authors have written about the conditions necessary to stimulate creative thought. We have synthesized the theories of different social scientists to create our own framework of internal and external factors.⁷¹ Internal factors, which focus on how the brain is wired, are Thinking Styles and Personality. External factors, which focus on what is happening outside the individual self, are Knowledge, Environment (Physical and Personal), and Circumstance.

All factors are, of course, influenced by such elements as age, experience, and the stage of our individual development.⁷² Moreover, the categories are fluid, frequently spilling over into one another. They are interdependent; internal factors may be influenced by knowledge, environment, and circumstance, just as external factors are influenced by our thinking styles and personalities. Not every factor is necessary to creative thinking. Adequacy in one area, such as a mentor in one's environment, can complement a deficiency in another area, such as a judicial thinking style.

⁷¹ Carl Rogers used the labels of inner and external conditions, as well. His inner conditions are: openness to experience, internal locus of evaluation, ability to toy with elements or concepts. His external factors are psychological safety and psychological freedom. CARL ROGERS, ON BECOMING A PERSON: A THERAPIST'S VIEW OF PSYCHOTHERAPY 347-359 (1961). Later, social psychologists Robert J. Sternberg and Todd I. Lubart combined the work of earlier theorists to elucidate a series of factors or "resources" that inspire creativity. Their factors, several of which we incorporate into our own scheme, are: Intelligence, Knowledge, Intellectual Style, Personality, Motivation, and Environment. Robert J. Sternberg & Todd I. Lubart, *An Investment Theory of Creativity and its Development*, 34 HUMAN DEVELOPMENT 1-31 (1991).

⁷² See Linda Morton, Janet Weinstein & Mark Weinstein, *Not Quite Grown Up: The Difficulty of Applying an Adult Education Model to Legal Externs*, 5 CLINICAL L. REV. 469 (1999).

Both internal and external factors are dependent upon the workings of our individual brains and how we filter information. It is important to recognize that these factors⁷³ are all aspects of brain functioning and develop as a result of the combination of genetic inheritance and experience.⁷⁴ While we have been applying a fairly simplistic understanding of brain functioning, the complexities of the interaction between genes and experience are important to keep in mind lest we come away from this exercise pretending to know too much about the brain. Nevertheless, our simplified understanding does allow us to think about the brain's role in creative thinking at an elementary level, which is a good beginning point.

A. *Internal Factors: Personality Traits and Thinking Styles*

Internal factors describe aspects of a person that are determined by how that person's brain functions as a result of genetic inheritance and experience. The primary factors within this category are personality traits and thinking styles.

1. *Personality Traits*

Personality characteristics conducive to creative thinking include innocence,⁷⁵ tolerance of ambiguity, openness,⁷⁶ perseverance and op-

⁷³ Even environment is affected by our genes and prior life experiences, as it is at least in part a function of the choices we have made that have placed us in the environment in which we find ourselves. Furthermore, the way that we respond to our environment is dependent upon genes and experience.

⁷⁴ For a more scientific discussion of the role of genes and experience in emotional development see JOSEPH LE DOUX, *THE EMOTIONAL BRAIN: THE MYSTERIOUS UNDERPINNINGS OF EMOTIONAL LIFE* (1996), and for their role in learning, see JOSEPH LE DOUX, *THE SYNAPTIC SELF: HOW OUR BRAINS BECOME WHO WE ARE* (2002).

⁷⁵ See DE BONO, *supra* note 6, at 43; GERARD I. NIERENBERG, *THE ART OF CREATIVE THINKING* 21-26 (1996); see generally ABRAHAM H. MASLOW, *THE FARTHER REACHES OF HUMAN NATURE* (1971). Maslow defined this innocence as "without *a priori* expectations, without 'shoulds' or 'oughts' . . .". *Id.* at 62. Maslow also believed that trust is an important element for creativity. *Id.* at 65. We would include trust within the concept of openness.

Maslow felt that education needed to prepare people to live in a rapidly changing world where neither facts nor techniques would be adequate for keeping pace, in other words, to train people who are prepared to deal comfortably with change.

. . . what I'm talking about is the job of trying to make ourselves over into people who don't need to staticize the world, who don't need to freeze it and to make it stable, who don't need to do what their daddies did, who are able confidently to face tomorrow not knowing what's going to come, not knowing what will happen, with confidence enough in ourselves that we will be able to improvise in that situation which has never existed before.

Id. at 57.

⁷⁶ Donald W. MacKinnon, *The Nature and Nurture of Creative Talent*, 17 *AMERICAN PSYCHOLOGIST* 484, 488 (1962); PLSEK, *supra* note 33, at 45. Maslow spoke of the first stage of creativity as being non-judgmental. See MASLOW, *supra* note 75, at 57. It involves being in the present moment without concern for what will come. *Id.* at 59. de Bono's

timism,⁷⁷ motivation,⁷⁸ discipline,⁷⁹ and tolerance for risk. Creative thinkers have individuality, strong convictions, an internal locus of evaluation,⁸⁰ and a healthy balance of the two hemispheres of the brain.

These personality traits can be explained from the perspective of brain functioning. *Innocence* is conducive to creativity, because the brain is not busy attempting to reinforce old and inadequate pathways. This is why children have a reputation of being creative; they have not yet formed the deep thinking ruts that keep us stuck.

A *tolerance for ambiguity* or willingness to “remain in uncertainties” has been identified as a prerequisite for creativity.⁸¹ Because the brain is comfortable traveling its beaten paths, movement off these paths can seem risky and give rise to resistance. Similarly, ambiguity, the state of being uncertain about what is true or right, is uncomfortable because the brain moves to process information to a resolution. People who are able to tolerate this discomfort, and who may even enjoy it, are more likely to engage in the creative thinking process.⁸²

concept of “Tuned Judgment” also involves the element of openness, as it requires the ability to see value in a new idea. DE BONO, *SERIOUS CREATIVITY*, *supra* note 6, at 62.

⁷⁷ ANDERSON, *supra* note 6, at 14. Such optimism includes belief in one’s own creative potential. “Your expectation of creativity fosters its own growth and expression.” EIFFERT, *supra* note 6, at 2.

⁷⁸ *Id.*; DE BONO, *SERIOUS CREATIVITY*, *supra* note 6, at 47.

⁷⁹ Discipline is implicit in much of what has been written about creative thinking. De Bono’s Six Hats process requires discipline in keeping the mind focused on one aspect of a problem at a time; Maslow’s second stage of creativity requires discipline and hard work; Sternberg and Lubart name perseverance, which is closely related to discipline, as an important ingredient. Sternberg & Lubart, *supra* note 71, at 1-31.

⁸⁰ See Sternberg & Lubart, *supra* note 71, at 13-14 and sources cited therein; ANDERSON, *supra* note 6, at 124; EIFFERT, *supra* note 6, at 180-184. See also ROGERS, *supra* note 71, at 119 (A person recognizes that “the only question which matters is, ‘Am I living in a way which is deeply satisfying to me, and which truly expresses me?’ This I think is perhaps the most important question for the creative individual.”); DE BONO, *SERIOUS CREATIVITY*, *supra* note 6, at 59-60.

⁸¹ Daniel J. Kornstein, *The Double Life of Wallace Stevens: Is Law Ever the “Necessary Angel” of Creative Art?*, 41 N.Y.L. SCH. L. REV. 1187, 1280 (1997) (citing Keats). One value of legal uncertainty is that it forces students to face the limits of logical reasoning and precedent. *Id.* at 1284-85. Kornstein is optimistic that “[l]egal education’s stress on precedent may unintentionally breed, more than anything else, skepticism of such precedent.” *Id.* Hopefully he is correct. However, he also seems to admit that this skepticism and wisdom do not arise directly from law school education. “In law, practical wisdom earned from experience is a highly sought virtue. Gray hair on a lawyer betokens a veteran who supposedly can give better advice based on the hard lessons he or she has learned. There are no child prodigies among trial lawyers. A lawyer typically does not find his or her stride until age forty, and really does not achieve eminence until his or her mid-fifties or later.” *Id.* at 1285-86. It could be that legal education actually delays the development of this practical wisdom of which Kornstein speaks. It might be that lawyers are able to develop this wisdom in spite of their legal training, rather than because of it. One must question why the lessons must be so hard and take so long.

⁸² See MASLOW, *supra* note 75, at 82-90.

Being *open* to new possibilities is foundational for creative thinkers. This element is closely tied to the thinking styles discussed below; the more flexible and less conservative the style, the more likely the person is to be open. Individuality is a quality valued by Abraham Maslow in his description of the creative person. According to Maslow, people who are very concerned with how others think of them, with doing things the “proper” way, with being critical of themselves and others, and who are rigid and careful, have a difficult time being creative. They may not be in touch with their individuality, or may not allow themselves the freedom to express it.⁸³

Perseverance is important to creative thinking, because hard work and determination may be necessary to go through the obstacles to creative thinking. The mental blocks we encounter in the frustrating endeavor of continuing down mental pathways that do not work, as well as the discomfort engaging in the creative thinking process, require perseverance.

Optimism is complementary to perseverance; if we do not believe that a successful outcome is possible, we have no reason to persevere. Optimism may also be related to happiness, which has a positive effect on the activity in the prefrontal cortex, where our problem solving occurs.⁸⁴

The *motivation* for creative thinkers is intrinsic versus extrinsic, although extrinsic rewards may enhance motivation.⁸⁵ Intrinsic motivation is related to the trait of an internal locus of control, also identified as characteristic of creativity. Just as with the other personality traits, motivation and locus of control are products of the gene/experience interplay. The way we relate to any particular circumstance is determined by the pathways that interpret and give meaning to that circumstance. People who have had positive experiences with problem solving may identify themselves as creative problem solvers; their self-identity will be affected by this positive experience and will strengthen their pre-existing personality traits. Self-identification as a creative problem solver thus becomes a motivator.

The law school environment certainly encourages students to per-

⁸³ *Id.*

⁸⁴ Restak provides information from a study conducted by Antonio Damasio, where PET scans showed increased frontal lobe activity among participants recalling happy events and decreased frontal lobe activity when participants remembered events involving anger or fear. RESTAK, *supra* note 42, at 111. Since the frontal, and particularly, the prefrontal area of the brain is responsible for our executive thinking processes, emotional conditions that stimulate activity in this area would be appropriate.

⁸⁵ Sternberg & Lubart, *supra* note 71, at 14-16 and sources cited therein. Carl Rogers believed that all persons are intrinsically motivated to self-actualize. ROGERS, *supra* note 71, at 35 (defining “self-actualize” as expanding and developing to meet one’s full potential).

severe and to tolerate ambiguity in the law. Yet other factors discourage this. For example, although students begin their legal education in relative innocence, their brains quickly acclimate to the very linear thinking generally taught. A student's optimism may be dampened by the highly competitive atmosphere. And, law schools' focus on external motivators such as grades and class rank no doubt discourages those students with higher internal motivation. On the other hand, were law schools to emphasize broader thinking patterns, a more collaborative environment, and learning for learning's sake, creative thinking could better flourish. Part V offers a few suggestions to nourish these components.

2. *Thinking Styles*

"When we approach problems or decisions, we employ a set of specific strategies, whether we know it or not. Each of us has a preference for a limited set of thinking strategies."⁸⁶ Intellectual styles are the result of habituated use of particular pathways in the mind. Once a pathway is successful at solving a problem, the brain will depend upon it again. The more frequently the pathway gets used, the more heavily it is relied upon and the deeper the thinking rut becomes. For example, students taught to go to legal encyclopedias to begin their research may continue to attempt to find answers in the encyclopedias even when that resource is inappropriate, such as when the research involves a statute.

Maslow and other psychologists⁸⁷ articulated a two-stage model of creativity which requires the utilization of two different thinking processes. The first stage involves inspiration, fantasizing and being free to think random thoughts, while the second stage, the implementation phase, involves hard work and discipline. The second stage applies the concepts that have emerged from the first stage to our more traditional analytical mode of thinking. While it also encourages creative combining of ideas, the second stage requires discipline, stubbornness and hard work.⁸⁸ The thinking style reflected by this model of creativity requires the flexibility to shift between two dramatically different processes and the ability to access the strengths of both brain hemispheres, focusing on one at a time.

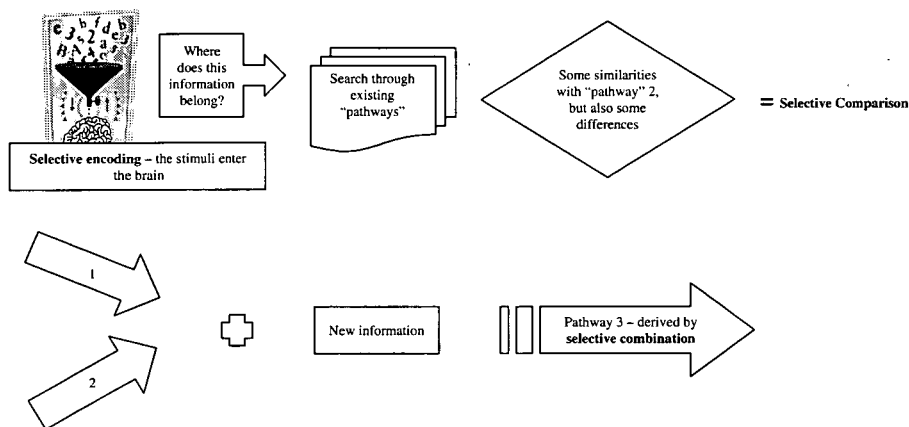
Sternberg and Lubart further detail the analytical thinking pro-

⁸⁶ HARRISON & BRAMSON, *supra* note 34, at 1 (these strategies can be catastrophic if overused). This is one of many models of intellectual styles that provide some insight about how creative thinking can be difficult for most people unless they are aware of their thinking style.

⁸⁷ See, Culp, *supra* note 4, at 64, 65.

⁸⁸ *Id.*

cess, labeling it “Intelligence.” Intelligence involves the ability to reconceptualize a problem in a new way – essentially, to redefine the problem,⁸⁹ and thus is a function of a person’s thinking style. The brain activities engaged in these processes are selective encoding,⁹⁰ selective comparison,⁹¹ and selective combination.⁹² In graphic representation, this process might appear as:



Other thinking styles also encourage creativity. For example, creative thinkers tend to use a “legislative” style (inventing their own rules and

⁸⁹ Sternberg & Lubart, *supra* note 71, at 1-31. Throughout the literature of creative thinking and creativity, one process that is always named as required is the ability to define and then redefine problems *See, e.g.*, Alan A. Stone, *Legal Education on the Couch*, 85 HARV. L. REV. 392, 420-21 (1971) (possible condition for creativity is that “the problem as initially posed was vague and undefined, so that part of the task was to formulate the problem itself.”).

Such process requires an *openness* to finding that the problem is something other than what it was originally thought to be, *flexibility* in approach, and *motivation* to do more than “satisfice,” a term coined “to describe the human approach to choice making: satisficing is the mental activity associated with making reasonably good, but not necessarily optimum, choices in response to the challenges of life.” PLSEK, *supra* note 33, at 45.

⁹⁰ The creative thinker must have the ability to pull needed information from a mass of stimuli. As we know, in order to accommodate the constant stimuli our brains receive, we tend to selectively perceive information according to established patterns in our minds. Information that does not appear to fit into these patterns is not consciously perceived. Thus, if the brain has a pre-existing concept about the problem at hand, it will perceive information that fits that concept. In order to expand our perception, we need to make a conscious effort to notice other things - to be more aware of the variety of stimuli available. By focusing on information that previously has been ignored, new insight is possible. *Id.* at 36.

⁹¹ The brain will attempt to find a familiar idea/pathway in which to locate the information so that it conforms to what already is in place. As part of this process, it will notice differences and may search for a better place to situate the information, with information that has other similarities. This process will necessarily involve moving through different pathways to find the best fit.

⁹² The process of defining and redefining problems requires the use of selective combination – putting together selected pieces of information in a novel and creative way.

procedures), rather than an “executive” (implementing the rules) or “judicial” (evaluating the rules) style. They tend to be “intuitive” and “global” (using the imagination, looking at the big picture), versus “local” and “sensing” (working with reality, paying attention to details) thinkers. They have a “progressive” (seeking innovation and change) rather than a “conservative” (preferring traditional approaches) attitude.⁹³ In the framework of the Myers-Briggs Type Indicator, creative thinkers tend to be introverts, intuitive rather than sensing, and perceptive rather than judging.⁹⁴

Harrison and Bramson discuss five thinking styles and their compatibility with creative thinking. “Synthesists” are open to change, an important aspect of creative thinking. They are interested in making connections between seemingly disparate ideas – a fundamental process in creative thinking. “Idealists” are receptive to new ideas, an important quality for creative thinking. “Pragmatists” are very flexible, a cornerstone of creative thinking. They are also good at finding ways to solve problems with available resources, a quality that takes creative thinking because it forces new conceptualizations about these resources. “Analysts” bring to the creative thinking process a focus on detail that can be important to creating value in a new idea. Their concern with data can also be helpful in ensuring that sufficient knowledge is available for engaging in the problem solving process. “Realists” concern with agreement and consensus can be an asset for creative thinking, if that motivation leads them to engage in new ways to find connections between differing views.

As always, in dealing with models, it is important to remember that they are only representations, not reality. They need to be used only as frames of reference, as a way to talk about how we all process and use information differently. Only by combining the helpful qualities of each of the styles do we achieve the optimum make-up for creative thinking. Knowing that we have limitations due to our thinking style preferences, (our personal “ruts”), we can appreciate the value of collaborative work and an environment that encourages creative thinking.

Legal education clearly supports Sternberg and Lubart’s notion of “intelligence” with its emphasis on analogical reasoning. To nurture creative thinking, law schools must encourage a variety of thinking styles. For example, “Legislative” thinking can be encouraged by giving students only the facts to the case and discussing the possibility of outcomes. Faculty can encourage students to talk about more global policy issues to complement the more detail-oriented appellate case

⁹³ PLSEK, *supra* note 33 at 11-13 and sources cited therein.

⁹⁴ MacKinnon, *supra* note 76, at 489-490.

discussions.

B. External Factors

Knowledge, environment, and circumstance reach us from external sources. However, because we interpret these factors according to patterns already set in our brain, they affect and are affected by internal factors, as well.

1. Knowledge

We rely greatly on knowledge; professionals with years of experience are more valued and respected than are newcomers to the profession. Substantive information is important because it provides a frame of reference for understanding a problem; it provides the framework for the brain to engage in selective comparison and selective combination in thinking creatively. It is rare that one without knowledge in a particular field can come up with an idea that is both unique and of value. However, an outsider can come up with a unique approach, which, with some adaptation by a trained professional with knowledge, can be turned into a valuable idea.

Solving *legal* problems requires a foundation in substantive law and process.⁹⁵ The bar examination tests substantive knowledge heavily, requiring a large amount of memorization in preparation. However, too much knowledge in a subject area can impede creative thought by making it too difficult to free oneself from deeply entrenched patterns. In all professions, the emphasis on “technical rationality”⁹⁶ distracts from an examination of how professional

⁹⁵ See, e.g., Stone, *supra* note 89, at 420-21 (“If creativity is to occur, the student must first master the mass of cognitive information necessary to inform his creative efforts.”) Stone opined that, because this base of information is a prerequisite to creativity, attempts to induce creativity in first year law students by changing pedagogical styles would be futile. *Id.* He further suggested that legal education, because it is a generalist approach, is incompatible with being creative. *Id.* at 421. For further discussion of developmental issues regarding creativity, see Paula Lustbader, *Construction Sites, Building Types, and Bridging Gaps: A Cognitive Theory of the Learning Progression of Law Students*, 33 WILLAMETTE L. REV. 315 (1997). Perhaps Stone was more correct than he even imagined. His focus was on substantive knowledge, and while some might disagree that it is necessary to indoctrinate students with a morass of case law, the case law approach is validated by the academy as a means of teaching lawyering skills, in particular “thinking like a lawyer.” It is this repeated and nearly exclusive modeling and valuing of critical, analytical thinking that creates the problem for future creative thinking by law students. In light of what we know about the working of the brain, it is problematic that the pedagogical styles used by law professors are, for the most part, very similar, and are, therefore, conditioning the thinking patterns of law students. While a change in pedagogy may not make first year students more creative, a variety of pedagogical styles, including styles explicitly aimed at promoting creative thinking, is necessary to develop the skills our students will need as lawyers.

⁹⁶ Technical rationality” was Donald Schon’s term for “substantive” knowledge, the body of scientific work or doctrinal knowledge on which a profession is supposedly

problems are actually solved. We frequently speak of lawyers who have practiced in a certain specialty for a long time as having become “jaded” or having lost their “edge,” because they tend to lose their ability to see each situation as new or unique. This happens because the repeated use of specific thought processes and knowledge bases creates deep ruts; all subsequent information is processed through these over-used pathways. To alleviate this over-emphasis on legal knowledge, law schools are increasingly adopting interdisciplinary instruction. Thus, courses in which law students must learn knowledge of other disciplines and interact with students pursuing other professions are conducive to creative thinking.

2. Environment

Creative thinking requires the ability to engage in uncensored thought – to allow the brain to freely associate ideas that might seem unrelated and to allow ideas to surface from the subconscious. In order for creative thinking to thrive, the environment must be “psychologically safe” or non-judgmental.⁹⁷ It must be diverse; mentors must be available;⁹⁸ and the physical setting must be informal, open and conducive to interaction.⁹⁹

In order to create a *non-judgmental* environment, we must eliminate elements such as group norms and authority, which can stifle creativity. When people are being judged, or are expected to conform to particular behaviors, they edit their thoughts, even subconsciously.

based. In medicine, that is what the medical school curriculum calls basic science. In law, it is the rules and policies studied in doctrinal courses.

Richard K. Neumann Jr., *Donald Schon, The Reflective Practitioner, and the Comparative Failures of Legal Education*, 6 CLIN. L. REV. 401, 404-405 (2000).

But Schon would have said that most of the legal academy is wrong: the legal rules are only background and context surrounding what these two lawyers do. If we understand only some of what negotiating lawyers really do, it is because – even today after more than two decades of work by clinicians and others interested in the non-doctrinal aspects of lawyers’ work – the scholarship of law faculties has been over-invested in what Schon would have considered technical rationality (the rules of law) and underinvested in what he would have considered practical reflection (the process through which professionals solve problems).

Id. at 404-405.

⁹⁷ ROGERS, *supra* note 71.

⁹⁸ Sternberg & Lubart, *supra* note 71, at 22. EIFFERT, *supra* note 6, at 24.

⁹⁹ See generally Sternberg & Lubart, *supra* note 71, for a description of environmental factors that stimulate creative thinking. Recently, there have been extensive discussions on the problems inherent in our law school environment and curricula. See, e.g., Susan Dacicoff, *The Role of Legal Education in Producing Psychological Distress Among Law Students and Lawyers*, 1986 AM. B. FOUND. RES. J. 225; Glesner, *Fear and Loathing in the Law Schools*, 23 CONN. L. REV. 627 (1991); Gerald F. Hess, *Heads and Hearts: The Teaching and Learning Environment in Law School*, 52 J. LEGAL EDUC. 75 (2002); Lawrence S. Krieger, *Institutional Denial About the Dark Side of Law School, and Fresh Empirical Guidance for Constructively Breaking the Silence*, 52 J. LEGAL EDUC. 112 (2002).

Freedom from judgment also creates a more relaxed, less stressful atmosphere that has been shown to nurture creativity.¹⁰⁰

Diversity has been proven to enhance creativity. In one study, students from diverse backgrounds proved to be more creative in their thinking processes than Caucasian students.¹⁰¹ In relation to brain functioning, diversity increases the pool of information or knowledge that is available for working on the problem, as a result of the wider range of personal experiences held by group members. It also increases the breadth and depth of thinking styles and personalities, so that all necessary components of creative thinking are present. While each member of the group may be stuck in his/her own ruts, the group effort can function as a “mega-brain”, engaging in combining and connecting old pathways to create something new.

Creative thinking is a learned process. While books and articles on creative thinking are helpful, real models and *mentors* are invaluable.¹⁰² Modeling and mentoring are important for several reasons. First, for purposes of motivation and perseverance, it is important to be able to see that creative thinking really works. Demonstrations of creative thinking can serve that purpose. Second, a mentor can provide the nurturing and support necessary to undertake what might seem like a risky or uncomfortable process. A person who believes in

¹⁰⁰ Sternberg & Lubart, *supra* note 71, at 16-17, and sources cited therein. Rogers discussed the need for psychological safety and psychological freedom. ROGERS, *supra* note 71, at 43 (addressing the importance of trust). We must reduce stress around problem solving. Those who are most relaxed use the largest areas of the brain during the process. In one study, . . . the relaxed group generated more and better ideas more quickly and with less conflict. *Id.* at 131. For a discussion of specific changes needed in the law school environment to inspire creativity, see Hess, *supra* note 99, at 83-84.

¹⁰¹ Robert J. Sternberg, *Equal Protection Under the Law: What is Missing in Education*, 2 PSYCHOL. PUB. POL'Y & L. 575 (1996).

¹⁰² See Comments of Gregory Williams, Plenary III, Mobilizing Creative Problem Solvers, 37 CAL. WEST. L. REV. 83, 94:

A large number of our students come to law school wanting to be litigators, and think they're going to be litigators. Actually, most of them don't end up being litigators, but the problem is that that is often the mindset that they have when they begin in law school. And of course, we reinforce that to a certain extent in terms of our initial focus . . . in focusing on the adversarial model. That reinforces this mindset that's awful difficult for us to get beyond.

The use of the term “mindset” is an interesting one in this context. Literally, because the brain is conditioned to think in a particular way - including to draw the conclusion that the real practice of law occurs within the adversarial process - the first year of law school goes far in shaping the synaptic connections or pathway of the brain, making it very difficult to introduce new ways of thinking after the first year. Perhaps this is why so many students seem to be disturbed as they move close to graduation with the awareness that they do not like “the practice of law.” They see the practice as limited to engaging in the adversarial process. Older students seem to be less likely to fall prey to this “mindset”, perhaps because their life experiences provide some immunity to complete “transformation” and also because they are developmentally more reflective and capable of keeping the law school experience in perspective. See generally Morton et al., *supra*, note 72.

others' abilities to think creatively encourages optimism about the process. Finally, a close, open connection with a mentor would assist in a process of transferring the characteristics of creativity from the mentor's brain to the student's brain, by the act of closely following and repeating the behavior of the mentor.

The *physical setting* must be conducive to creative thinking. Flexibility is an asset to establishing an environment that helps us to jump out of ruts. Changes in seating arrangements and settings provide opportunities for new perspectives. For example, putting chairs in a circular pattern encourages interaction and increased opportunities for diverse thinking. Because our brains operate so as to associate ideas and situations with what is already known, the same old classroom setting increases the chances that the same old thoughts and thought processes will be accessed.

In addition to changing the physical set up of the classroom, law schools must focus on creating a more informal, non-judgmental environment. This might include such strategies as classes outside the school grounds, a feminist teaching methodology (encouraging peer collaboration), pass-fail courses, or a "grade free" class discussion. Student/faculty diversity, as well as the presence of mentors in the form of faculty or outside speakers who think creatively also nourishes the environmental component.

3. *Circumstance*

Finally, lest we be misleading by appearing to set forth a scientific formula for creative thinking, we must acknowledge that chance, accident and mistake often play a critical role in creative thinking. It is these elements that are beyond our control that often lead us to new insights by "startling" our brains with something unexpected. Several inventions and discoveries are the result of chance. For example, when Louis Pasteur noticed that red tartar in fermented wine grew mold, rather than throwing it out, he studied the mold, leading to his discoveries relating to the role of microorganisms in fermentation, and later, in infectious diseases.¹⁰³

With this improved understanding of how creative thoughts occur in the brain, techniques that stimulate their production, and factors that nourish their flow, we can better envision a law school setting conducive to creative thought.

¹⁰³ KOESTLER, *supra* note 10, at 193. Louis Pasteur's approach in his examination of the mold also exemplifies "Green Hat" thinking. Rather than discarding the problem created by the mold, Pasteur examined its positive aspects.

V. ENCOURAGING CREATIVE THINKING IN LAW SCHOOLS

Creative thinking is essential to good lawyering. The use of creativity in law practice extends beyond devising clever legal arguments and litigation strategies. It enhances our ability to think about issues and clients' problems in ways different from, and in addition to, our normal patterns of thought. Thus, the process of creative thinking expands our repertoire of skills in preventing and solving clients' problems. It can also enhance the attorney client relationship by extending the client-centered model to include attorney and client working together to find more creative solutions. Using alternative paths of thought to resolve issues is useful throughout the panoply of skills lawyers employ. In negotiation, mediation, and even day-to-day interactions with co-workers, creative thinking helps us move beyond the narrow walls of our law school training.¹⁰⁴

If we do consider creative thinking to be an important skill in the lawyering process, the question remains as to how we might teach it in law schools. We believe the process must begin with the teachers, themselves, and expand outward to the classroom, and to the law school environment. We cannot teach it and encourage it in our professional culture unless we understand it, believe in its value, and use it ourselves. Knowing that we all have the capacity to think creatively by simply encouraging the inception of new pathways in our brain and the collaboration of both hemispheres in the brain, we begin this part with our individual abilities to develop creative thinking skills, and then progress towards the larger environment. We offer our suggestions with both humility and hesitation: humility, because we are only just beginning ourselves; hesitation, because we do not want to limit others' creative capacities.

¹⁰⁴ We believe that law school already does encourage creative thinking, but in a limited way. Without question, legal analysis - the ability to extract relevant legal principles, apply them to different facts, and construct new legal arguments reflects fundamental components of creative thinking. For a further discussion of this process in the context of creative thinking, see Sternberg & Lubart, *supra* note 71, at 4-8. The problem is that this singular thought process limits how we solve clients' problems. The links between ideas are confined primarily to the well-worn thought processes involved in making legal arguments, thus digging a rut when it comes to the approach we take to solve a legal problem. A more central issue is the degree to which law school discourages other factors conducive to creative thinking. As one author succinctly put it:

The competition and grading systems, the focus on an external evaluation system, the constant critical evaluation in law school, and the tendency to divorce thought from feeling all are inconsistent with the proper functioning of the "idea stage" of creativity. The short three years of law school is a non-creative experience.

Culp, *supra* note 4, at 85. For additional support of the need for creative thinking in the practice of law, see *id.* at 89-90, and sources cited therein.

A. *Developing Creative Thinking in Ourselves*

Two arenas in which creative thought has great potential for law professors are our scholarship and our teaching methodologies. For example, in our scholarship, it is not unusual for us to feel stymied about what to write, or blocked on a specific topic. Our brains have formed deep ruts in certain subject areas, and it is difficult, at times, to forge new pathways and find the new, inspiring topic for our next article or book. To jump from these ruts, professors might try any of the techniques outlined in Part III. We might add an odd word on to a subject we are considering, discuss our topic with colleagues from a different discipline, think about expanding or narrowing the topic, or draw a picture of a potential theme. In Part III we described our own use of mind-mapping to focus on a topic. Prof. Linda Smith used a medical model to describe how we might give bad news to clients.¹⁰⁵ Another author used De Bono's more emotional red hat to better understand how she really felt about her writing topic, and why it was important to her, in order to refocus her theme.¹⁰⁶ At the same time we employ the techniques, it is important to keep in mind the external and internal factors described in Part IV that enhance creative thinking. Keeping an open mind is important, as is having some knowledge of the topic; being in an environment conducive to creative thinking is helpful. Such an environment might include individuals from other disciplines, mentors in our field, and a comfortable, non-judgmental setting.¹⁰⁷

Faculty who wish to pursue their own creative thinking capabilities may include it in their teaching, as well. In this way, we mentor it for our law students, thus encouraging their creative thinking processes. Some professors have used fiction or narrative in their teaching of legal concepts.¹⁰⁸ Professors who teach Property might bring in pictures of property portraying an easement problem. We might consult faculty within other disciplines.¹⁰⁹ Contracts professors might talk with their colleagues in business schools, or even attend a class, to learn additional teaching methodologies. Additionally, we

¹⁰⁵ Linda F. Smith, *Interviewing Clients: A Linguistic Comparison of the "Traditional" Interview and the "Client-Centered" Interview*, 1 CLINICAL L. REV. 546, 580-587 (1995).

¹⁰⁶ Discussion with participant in AALS Clinical Law Conference. Spring, 2001.

¹⁰⁷ At California Western, the authors hope to conduct workshops for faculty who are "stuck" in their writing or teaching processes.

¹⁰⁸ Dean S. Davis, *Tell Me a Story: Using Short Fiction in Teaching Law and Bioethics*, 47 J. LEGAL EDUC. 240 (1997); Alfred R. Light, *Civil Procedure Parables in the First Year: Applying the Bible to Think Like a Lawyer*, 37 GONZ. L. REV. 283 (2001-02).

¹⁰⁹ See Nira Hativa, *Teaching Large Law Classes Well: An Outsider's View*, 50 J. LEGAL EDUC. 95 (2000) (mathematics professor describes methods of enhancing large group learning).

might look to alternative methods of getting feedback on our teaching. Rather than relying upon end-of-year student evaluations, some professors are trying “student advisory teams”¹¹⁰ and “quality circles”¹¹¹ to enhance their teaching, as well as students’ learning in the classroom. Others have written of the need to diversify our teaching to conform to a variety of student learning styles.¹¹² At California Western, we have incorporated the Personal Response System¹¹³ in the classroom to better engage students and encourage more consistent feedback on what students are learning. The response system emphasizes more active, kinesthetic and visual learning styles, rather than the more passive, auditory style of most large classrooms.

B. Teaching Our Law Students to Think More Creatively

Incorporating more creative thought processes in our own work better equips us to teach creative thinking in our classrooms. The teaching can be both explicit and implicit. For example, at California Western, we offer an area of concentration in Creative Problem Solving, which includes courses in Problem Solving Skills and Theory, and Problem Solving and Preventive Law.¹¹⁴ We also teach the specific

¹¹⁰ Gerald S. Hess, *Student Involvement in Improving Law Teaching and Learning*, 67 U.M.K.C. L. REV. 343 (1998); Peter J. M. MacFarlane & Gordon Joughin, *An Integrated Approach to Teaching and Learning Law: The Use of Student Peer Mentor Groups to Improve the Quality of Student Learning in Contracts*, 5 LEGAL EDUC. REV. 153 (1994). For a description of varied teaching methods and their benefits, see Paul Bateman, *Toward Diversity in Teaching Methods in Law Schools: Five Suggestions from the Back Row*, 17 Q.L.R. 397 (1997); Paula Lustbader, *Teach in Context: Responding to Diverse Student Voices Helps All Students Learn*, 48 J. LEGAL EDUC. 402 (1998).

¹¹¹ Eric W. Orts, *Quality Circles in Law Teaching*, 47 J. LEGAL EDUC. 425 (1997).

¹¹² Lustbader, *supra* note 112 (describing numerous exercises to promote learning from student’s own context and thinking style); Vernellia R. Randall, *The Meyers-Briggs Type Indicator, First Year Law Students and Performance*, 26 CUMBERLAND L. REV. 63 (1995-96) (describing test to help students and law teachers better understand how individual students learn); Menkel-Meadow, *supra* note 26, at 138-140.

¹¹³ The Personal Response System allows students in class to respond to multiple choice questions posed by the professor. Students select an answer and press the appropriate button on personal devices that convey the students’ responses electronically to the professor. The results, electronically posted on an overhead, give the faculty member immediate feedback on which concepts students understand, and which they don’t. The use of the Personal Response System is an excellent example of creative thinking; it demonstrates how knowledge can be borrowed from one “discipline”, in this case the field of entertainment, to solve a problem (lack of opportunities for student engagement in a big class setting, and, lack of feedback to professors about what their students are learning) in another discipline, education.

¹¹⁴ Prof. Thomas Barton teaches both classes. In addition to our courses at California Western, others have created courses that focus on a more expanded form of thinking. Practitioner Gordon MacLeod was one of the first to create such a course. See, MacLeod, *supra* note 2; Dean Emeritus Paul Brest and Prof. Linda Krieger created a course at Stanford on “Problem Solving, Decision Making, and Professional Judgment” which “offers students opportunities to experience and reflect on ‘conscious creative moments’ in a vari-

skills outlined in Part III, and encourage students to use them in their thinking about legal issues. Author Janet Weinstein uses a “random object” technique to encourage students to talk about their goals and experiences.¹¹⁵ Author Linda Morton teaches creative thinking techniques to clinical students in the Internship Seminar, and has them write about their experiences using the techniques in their journals. Both authors require the final project in their clinical law classes be a creative rendition of their educational experiences.¹¹⁶ We are currently planning to also incorporate creative thinking techniques into the first year curriculum by devoting one class each semester to teaching and using these techniques.¹¹⁷

For faculty concerned about taking class time to teach creative thinking techniques, there are shortened versions one might label “teachable moments” throughout the curriculum in which we can encourage more expanded methods of examining legal doctrine. For example, one clinical law professor had a student who was blocked on drafting a court pleading. He had the student first address her emotional concerns about the issue, by writing a letter to the judge. The letter helped unblock the student’s drafting abilities in the matter, and enabled her to write the necessary pleading.¹¹⁸ Non-clinical teachers can encourage students to explore the facts of a case from a different perspective.¹¹⁹ One torts professor rethought his own view of *Katko v. Briney* when a student pointed out that the plaintiff’s handsome features no doubt helped him win what seemed to be an unreasonable

ety of lawyering roles.” Paul Brest and Linda Hamilton Krieger, *Lawyers as Problem Solvers*, 72 *TEMPLE L. REV.* 812 (1999). Clinicians have also incorporated creative problem solving techniques in their teaching and writing. *E.g.*, Lerner, *supra* note 4; Mark Neil Aaronson, *We Ask You to Consider: Learning About Practical Judgment in Lawyering*, 4 *CLINICAL L. REV.* 247 (1998); O’Leary, *supra* note 57 (using brainstorming as a technique to teach students to consider different perspectives on a client’s problem).

¹¹⁵ Prof. Weinstein brings in a variety of objects, distributes them to students, and has each student talk about his/her goals for the course in light of the object they are holding.

¹¹⁶ The purpose of implementing these techniques is to demonstrate to the students that they can be creative thinkers by approaching problems from new perspectives. Both authors would be happy to discuss these applications in further detail. Those interested can email Prof. Janet Weinstein at jweinstein@cwsl.edu, and Prof. Linda Morton at lm@cwsl.edu. For additional examples of creative techniques in the classroom, see Barbara Stark, *Exile on Campus*, 48 *J. LEGAL EDUC.* 430, 437 (1998) (describing students’ final project of a musical tape in lieu of a paper); McClurg, *supra* note 21 (describing his experience of asking students to write a poem in response to a case).

¹¹⁷ *But see* Lustbader, *supra* note 95 (using theory of learning progression, author describes problems in teaching beginning law students to be creative).

¹¹⁸ Email from Prof. John Farago of CUNY Law School to Lawcliniclistserve (July 1, 2002).

¹¹⁹ See Kaufman, *supra* note 25, at 263-64 (discussing the benefits to students when cases are taught from a multiple intelligence perspective).

cause of action.¹²⁰ Professors might emphasize more divergent thinking by asking students how else the case might have been handled.¹²¹ We might bring attorneys who have been successful in solving problems creatively to visit our classrooms. As professors, we can create a classroom more conducive to creative thinking by encouraging risk-free processes in which students can expand the way they view the law. For example, faculty can encourage small group discussion, or even offer push-points for more imaginative thinking. Classroom settings can be made more informal, with seating in circles, where possible. Faculty could discuss the more emotive, value-laden aspects of a case, rather than the simple white hat/black hat analysis. They can encourage additional creative thinking outside the class through the use of bulletin boards on class websites.¹²²

C. *Developing Creative Thinking in Law Schools*

Finally, we must encourage creative thinking in our law school environments. Decreasing emphasis on grades¹²³ and curricular restructuring¹²⁴ have been suggested. It is also critical to ensure diverse faculty, student, and administrative populations.¹²⁵ Below are additional suggestions, based on our own innovations at California Western.

To encourage the cross fertilization of ideas, and forging of new pathways, we have encouraged interdisciplinary work.¹²⁶ We currently have dual degrees in Law and Social Work, as well as Law and Business. Additionally, we have an affiliation, including several joint programs, with the University of California at San Diego. We have spent time and resources holding a series of workshops on creativity training, conducted by Dr. Robert Epstein for faculty. We have had a retreat focused on improving our teaching, during which we enjoyed presentations from, and discussions with, educational theorists outside the realm of legal education. As a result of the retreat, we have engaged the faculty in learning to use new teaching tools, including website bulletin boards, personal response systems, and computer exercises. We have encouraged creative thinking by trying to improve

¹²⁰ McClurg, *supra* note 21, at 826-827.

¹²¹ Menkel-Meadow, *supra* note 26.

¹²² Professor Janet Weinstein is currently using this technique in her Child Abuse and Family Law classes.

¹²³ Culp, *supra* note 4, at 92. Yale and Northeastern already have begun this process.

¹²⁴ Menkel-Meadow, *supra* note 26, at 142-43.

¹²⁵ See Sternberg, *supra* note 102, at 581 (discussing how, of four high-ability high school groups tested, the most creative group was most diverse racially, ethnically, socioeconomically, and educationally.)

¹²⁶ See Weinstein, *supra* note 45, at 354 (describing an interdisciplinary program).

the sense of community at the school, including getting to know our students as individuals. We use a questionnaire to learn about our students' experiences and interests outside the law. Faculty members are given students' responses to the questionnaire with the ultimate aspiration of encouraging students' broader participation in class discussions by creating a more personal environment. We have also used the creative thinking techniques to resolve some of our own dilemmas. We used the Six Hat Thinking Process at a faculty meeting to analyze and find more creative solutions to an ongoing issue. Students at California Western have formed a committee to find more creative solutions to improving their environment.

CONCLUSION

Possibilities for encouraging creative thinking in law schools are endless. Once we consider what we are attempting to do – create new pathways in our brains – and how we might do it – using both internal and external criteria, the road seems less formidable.

In our vision, professors would regularly engage in creative thinking techniques in planning their classes and in thinking about their scholarship. They would seek the help of colleagues in and outside of the law for brainstorming in a creative way. They would share with others the creative breakthroughs they have experienced. Faculty members would gather in a common area to engage in creative thinking and test new ideas with each other without fear of judgment. Classrooms would be a place in which new and exciting ideas about the possibilities of the law are forged. Students would fearlessly offer thoughtful suggestions in class. Even the law school itself would be more “alive”. Its structure would be more conducive to informal gatherings where creative ideas could flow. It would be more open to the infusion of ideas from other disciplines. Various groups could use the law school setting to think more creatively about resolving community issues.

In essence, we are attempting to expand the concept of legal education to comport more with the skills necessary to lawyer well in the twenty-first century. Our first step is to expand the way we think about our own work and the way we train our students to think.

