Something Borrowed: Interdisciplinary Strategies for Legal Education

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I. Introduction

Law professors are by and large not trained educators. We are either trained practice professionals who transition to teaching as a second or third successful career, or experts in a particular topic area who research and write on that topic. Law professors on balance tend not to have a background in education theory or practice. We are thrust into a higher education setting with little in the way of tools other than peer mentorship. We are quick studies, however, and can adapt and conform to styles and practice and draw on our own legal education, but we rarely have the background or the time to become education experts.

Identifying the dearth of expertise in teaching and learning, we turn to the idea of borrowing teaching methods from trained educators. The focus of this article is "Borrowed Strategies," as we look to education theories and techniques from other disciplines that encourage faculty and students to achieve better learning in law school and to ultimately become better practitioners.

In this article, we posit that while some traditional law education strategies and techniques are historically successful in developing critical-thinking abilities, additional teaching and learning theory and practice methods borrowed from other education disciplines are necessary for students to transfer learning from school into practice. In Part I, we identify and dismiss learning fallacies such as the theory of "learning styles" as unsupported by evidence. In Part II, we discuss learning competencies, by way of explaining expert versus novice knowledge. In Part III, we turn to brain science and metacognition to describe how we know what we know and how we increase knowledge. Finally, in Part IV we discuss what legal education gets right in learning, *vis-à-vis* modes, competencies, and metacognition. We conclude with

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our recommendation that law educators borrow from and collaborate with trained educators to incorporate and develop well-rounded teaching and learning strategies.

II. Something New: 'Learning Styles' and Other Fads Will Not Advance Law Education

New ways of thinking about learning represent new territory for law education.[1] These techniques are based upon ideas informed by a capacious literature on biology, psychology, and education, each typically beyond the scope or practice of law. Law, known for its reticence if not conservatism with regard to innovating classroom instruction, increasingly concerns itself with teaching practice. The law also finds itself behind other professional fields (for example, medicine, to which law unfavorably compares itself) in its ability to establish "relevance" in teaching.[2] However, if legal education has been slow to adopt such applications there may be a silver lining, as so much of what we think we know about learning is folkloric, which is to say, often wrong. Unfortunately, education itself is subject to fads and fallacies, which the study of law may sidestep with attention.

A. The Brain, the Mind, and Education: Who Owns It?

In 1899, the psychologist William James, in a series of talks for teachers, reflected on the dangers of popularizing and applying a new science to teaching—in this case psychology—without fully understanding the implications of doing so:

> Psychology ought certainly to give the teacher radical help. And yet I confess that, acquainted as I am with the height of some of your expectations, I feel a little anxious lest, at the end of these simple talks of mine, not a few of you may experience some disappointment at the net results. In other words, I am not sure that you may not be indulging fancies that are just a shade exaggerated. That would not be altogether astonishing, for we have been having something like a "boom" in psychology in this country.[3]

James, writing 120 years ago, attempted to address the needs of schoolteachers in what was then surely a paradigm shift for science. Today the corollary might be the misapplication of *neuro*science to classroom teaching, ideas about the

1. *See* ABA Standards: 2017-2018 Standards and Rules of Procedure for Approval of Law Schools, American Bar Association, https://www.americanbar.org/groups/legal_education/resources/standards.html.

2. William M. Sullivan et al., Educating Lawyers: Preparation for the Profession of Law 21-47 (2007) (See generally Chapter 1, on the three apprenticeships.).

3. William James, Talks to Teachers on Psychology And to Students on Some of Life's Ideals (2008).

way the brain works that have been misunderstood and misapplied to learning for decades, yet continue to exercise a toehold on the public imagination.[4]

Law education is not immune from the influence of these certitudes, which include learning styles, multiple intelligences, multitasking and other fallacies often referred to by neuroscientists as *neuromyths*—commonly held beliefs about the way the human brain affects learning that are patently wrong.[5]

The study of brain structure and brain function properly belongs to neuroscience, a subfield of biology. The field, which formalized in the 1950s, integrated anatomy and physiological research with clinical psychiatry, drawing from biology, chemistry, and physics. By the 1970s, education researchers attempted to locate neuroscience in education, about the time that Howard Gardner's work on multiple intelligences was published, the latter proving wildly popular among schoolteachers.[6] The field of educational neuropsychology (which linked education with developmental psychology) also appeared at this time. Educational neuropsychology emphasized the study of learning, but notably did not serve teaching needs.[7]

This period began a great popularization of information on neuroscientific research. The advent of fMRI, MEG, and other technologies only fueled the public's imagination about the applicability of brain science to everyday activities, including learning. Neuroscientific research received astonishing attention by the end of the twentieth century. In the United States, the 1990s were declared the "Decade of the Brain."[8] No sector saw more potential in the work of neuroscience than did the field of education. The brain's neural networks are "common" but necessary for all "acts of intelligence," especially classroom learning.[9]

4. *See* Paul A. Howard-Jones, *Neuroscience and Education: Myths and Messages*, 15 Nature Reviews Neuroscience 817, 824 (2014); Olaf Jorgenson, *Brain Scam? Why Educators Should Be Careful about Embracing 'Brain Research,'* 67 The Educational Forum 364, 369 (2003), https://doi.org/10.1080/00131720308984585.

5. *See* Paul A. Kirschner, *Stop Propagating the Learning Styles Myth*, 106 Computers & Educ. 166, 171 (2017); *see also* John Geake, The Brain at School: Educational Neuroscience in the Classroom 109 (2009).

6. Mary Claycomb, *Brain Research and Learning: A Position Paper*, Nat. Educ. Ass'n (1978); Joanne Chall, Education and the Brain (Allan W. Mirsky ed., 1978); *see also* Tracey Tokuhama-Espinosa, *A Brief History of the Science of Learning: Part 1*, 9 New Horizons for Learning (2011).

7. Tracey Tokuhama-Espinosa writes, "Educational neuropsychology was an improvement over simple developmental psychology because neuroscientific studies were given more prominence. The lack of neuroscientific support for some of the studies in developmental psychology meant than many studies were about the 'mind' rather than the 'brain,' which some argued detracted from their applicability in teaching."

8. *Understanding the Brain: The Birth of a Learning Science: New Insights on Learning Through Cognitive and Brain Science*, Organization for Economic Cooperation and Development (2002), https://www.oecd.org/site/educeri21st/40554190.pdf.

9. Geake, *supra* note 5, at 109.

The human brain is considered by scientists to be the summa of complexity. Brain function, enabled by billions of neurons, features an astoundingly intricate neural functional interconnectivity. Higher-order brain functions encompass learning, memory, and reasoning. Interconnected brain functions include working and long-term memory, decision-making, emotional mediation, sequencing of symbolic representation, conceptual interrelationship, and conceptual and motor rehearsal.[10] The high integration and coordination of multiple processes distinguish the human brain as the most complex organism in the known universe.

This incredible neural interconnectivity makes the "left brain-right brain" theory of personality highly improbable and thus roundly debunked by neuroscientists. Left and right hemispheres of the brain work together for all cognitive tasks, even if there are functional asymmetries.[11] Unfortunately, the notion that different brain hemispheres control personalities remains pervasive among the public.

The idea that people use only ten percent of their brains is also a neuromyth.[12] One cognitive scientist writes that the idea is, in the first place, impractical: "Brain tissue is metabolically expensive both to grow and to run, and it strains credulity to think that evolution would have permitted squandering of resources on a scale necessary to build and maintain such a massively underutilized organ."[13] The ubiquity of the ten percent myth probably comes from journalistic treatments of scientific papers by early researchers of brain function.

The neuromyths of the "ten percent brain" and "left/right brain" theories illustrate the kinds of misguided applications of an early field by a public hungry for more. By the 1970s, educators began interpreting neuroscience findings broadly for the classroom, as did policymakers, the media, and companies selling education products.[14] In the years since, neuroscientists and theorists alike have written on the failure of nonscientists to properly translate

10. *See id.*; *see also* Vilayanur Subramanian Ramachandran, The Tell-Tale Brain: A Neuroscientist's Quest for What Makes Us Human (2012).

11. Annukka K. Lindell & Evan Kidd, *Why Right-Brain Teaching Is Half-Witted: A Critique of the Misapplication of Neuroscience to Education*, 5 Mind Brain Educ. 121, 127 (2011); *see also* Jared Nielsen et al., *An Evaluation of the Left-Brain vs. Right-Brain Hypothesis with Resting State Functional Connectivity Magnetic Resonance Imaging*, 8 PLOS ONE (2013). Geake also writes: "Such a pervasive correlation between different abilities is conceptualized as general intelligence, *g*. The existence of *g* not only suggests that the same brain modules are likely to be involved in many different abilities, but that their functional connectivity is of paramount importance. In fact, the main thrust of research in cognitive neuroscience in the next decade will be the mapping of functional connectivity, that is how functional modules transfer information."

12. *Understanding the Brain*, *supra* note 8.

13. *See* Barry L. Beyerstein, *Whence Cometh the Myth that We Only Use Ten Percent of Our Brains?*, *in* Mind Myths: Exploring Popular Assumptions About the Mind and Brain 1-24 (Sergio Della Sala, ed., 1999).

14. Kirschner, *supra* note 5, at 171.

their findings, representing these as largely inaccessible, incomprehensible, and irrelevant to educators.[15] The philosopher John Bruer, in a seminal 1997 position paper, admonished the education community: "The neuroscience and education argument attempts to bridge this chasm by drawing educationally relevant conclusions from correlations between gross, unanalyzed behaviors—learning to read, learning math, learning languages—and poorly understood changes in brain structure at the synaptic level. This is the bridge too far."[16]

As brain studies exploded, neuroscientists found themselves the object of perhaps unwanted attention[17] by a rapt public. There were theoretical barriers to the collaboration with education, starting with language and research literacy.[18] For example, nonscientists are likely to use such cognitive terms as "thinking" and "skills" grossly to accommodate immediate classroom concerns. Beyond the goal orientation of education also lay issues of scale and levels of analysis expressing wholly different foci: Neurobiology is genetic and molecular, while education is social and behavioral[19]—one fine, the other "gross." Neurobiology is also a natural science; education is applied.[20] However, teaching and learning appear to engage the sum total of human behavior, certainly complex in their own right.

B. Learning Styles: The Most Concerning Neuromyth in Higher Education

The neuromyth most closely held by faculty is the one widely associated with the classroom, the theory of learning styles. Learning styles theory was first postulated in the 1970s.[21] The premise of learning styles is this: Students

15. Noel Purdy & Hugh Morrison, *Cognitive Neuroscience and Education: Unravelling the Confusion,* 35 Oxford R. of Educ. 99, 109 (2009). Purdy & Morrison employ humor in their critique, drawing on the philosophy of Wittgenstein to highlight further conceptual confusion about the application of brain studies to education, writing: "Cognitive neuroscience may offer detailed pictures of neural networks, but, just as a thermometer fails to measure pain, so a brain scan fails logically to measure understanding: the concepts involved are simply different and the indeterminacy remains. Cognitive neuroscience therefore at best offers insights into the neural concomitants of thinking, but it offers no privileged access into the hidden world of the inner, that inner world being already manifest in external behaviour. Rather than representing a panacea to education, the cognitive neuroscientific enterprise in relation to education is therefore necessarily limited." *See id.* at 105.

16. John T. Bruer, *Education and the Brain: A Bridge Too Far*, 26 Educational Researcher 4, 16 (1997).

17. Ian M. Devonshire & Eleanor J. Dommett, *Neuroscience: Viable Applications in Education?*, 16 The Neuroscientist 349, 356 (2010).

18. *See id.*; *see also* Usha Goswami, *Neuroscience and Education: From Research to Practice*, 7 Nature Reviews Neuroscience 406, 413 (2004).

19. Daniel T. Willingham, *Three Problems in the Marriage of Neuroscience and Education*, 45 Cortex 544, 545 (2009).

20. Devonshire & Dommett, *supra* note 17 (referring to teaching as "an artificial science").

21. Some scholars include multiple intelligences in this definition, even though Howard Gardner is on record disputing this definition. Valerie Strauss, *Howard Gardner: 'Multiple intelligences' are not 'learning styles,'* Washington Post (Oct. 16, 2013), https://www.washingtonpost.com/

learn best by their expressed preference for a learning mode, whether visual, auditory, or kinesthetic.[22] The theory is based on the *meshing hypothesis*, that an alignment between learning styles and classroom instruction produces optimal learning.[23] The extrapolation for education (a student could improve if taught according to learning styles) was based on one valid finding in neuroscience: that visual, auditory, and kinesthetic information is processed in different parts of the brain.[24] However, even these separate structures are highly networked.[25]

It is true *both* that people exhibit preferences for receiving information *and* do not process information more effectively when they are taught according to that preferred learning style.[26] In other words, there is a difference between the way we prefer to receive information (often these are emotional/ noncognitive choices) and the way we actually learn. Learning styles are associated with subjective, not objective, aspects of learning.[27] The preference for how people study is not a learning style but is based upon typing, also little supported from primary research.[28]

In the thirty years since learning styles theory was propagated, the myth has mushroomed in scholarly publications, graduate curricula, posters, conference papers and workshops.[29] Rigorous research has failed to demonstrate that learning styles affect learning.[30] Individual learners show preferences for the mode in which they receive information (e.g., visual, auditory, kinesthetic) but learn no better when they receive information this way. Neuroscientists and cognitive psychologists alike widely pan the theory.[31]

news/answer-sheet/wp/2013/10/16/howard-gardner-multiple-intelligences-are-not-learning-styles/?utm_term=.cc8f3bd92d7a.

22. Walter L. Leite, Marilla Svinicki & Yuying Shi, Attempted Validation of the Scores of the VARK: Learning Styles Inventory with Multi-trait-Multimethod Confirmatory Factor Analysis Models, 70 SAGE Publications 232, 339 (2009).

23. Rita S. Dunn & Kenneth J. Dunn, *Learning Styles/Teaching Styles: Should They . . . Can They . . . be Matched*, 36 Educational Leadership 238, 244 (1979).

24. Sanne Dekker et al., *Neuromyths in Education: Prevalence and Predictors of Misconceptions Among Teachers*, 3 Front. Psychol. 429 (2012), http://www.academia.edu/1985122/Neuromyths_in_education_Prevalence_and_predictors_of_misconceptions_among_teachers.

25. *Id.*

26. Camilla K. Gilmore et al., *Symbolic arithmetic knowledge without instruction*, 447 Nature 589, 592 (2007).

27. Abby R. Knoll et al., *Learning style, judgements of learning, and learning of verbal and visual information*, 8 British J. of Psych. 544, 563 (2017).

28. Kirschner, *supra* note 5, at 171.

29. For example, Michael H. Schwartz, Expert Learning for Law Students (2d ed. 2008) espouses and relies on learning styles.

30. Willingham, *supra* note 19, at 545.

31. Gregory P. Krätzig & Katherine D. Arbuthnott, *Perceptual Learning Style and Learning Proficiency: A Test of the Hypothesis*, 98 J. Educ. Psychol. 238, 246 (2006); *see also* Walter L. Leite, Marilla Svinicki & Yuying Shi, *Attempted Validation of the Scores of the VARK: Learning Styles Inventory with*

The history of learning styles provides important lessons for the law classroom and, by extension, law teaching as an area of practice. Learning styles theory is described as theoretically incoherent and conceptually confused;[32] it has a demonstrably negligible impact on classroom practice and so is an inefficient use of instructors' time.[33] Some education scholars fear for the legitimacy of education, a discipline being undermined by pseudoscience and a tendency to ignore research-based practice.[34]

In one mammoth study of learning, derived from 1000 meta-analyses of the effectiveness of over 150 different procedures used in teaching that affect students' learning, matching teaching to the learning styles of students was found to have an insignificant effect, little above zero.[35] The author of the study, eminent education researcher John Hattie, writes: "We are all visual learners, and we all are auditory learners, not just some of us."[36] Lab studies confirm that everyone learns through multiple senses.[37]

In 2018, the theory of learning styles continues to be disproved, just as the theories continue to be believed.[38] The consensus among researchers and learning theorists is that we are often poor judges of our own learning,[39] something to keep in mind when we resist disbelieving neuromyths. Pseudoscience beliefs are still prevalent among teachers. In a 2012 study of 242 European schoolteachers who showed a strong interest in the neuroscience

Multitrait-Multimethod Confirmatory Factor Analysis Models, 70 SAGE Publications 323, 339 (2009); Harold Pashler et al., *Learning Styles: Concepts and Evidence*, 9 Psychological Science in the Public Interest 105, 119 (2008).

32. *See* Frank Coffield, *Learning Styles: Unreliable, Invalid and Impractical and Yet still Widely Used*, Elm Magazine (2013).

33. Pashler's definitive study found "no adequate evidence base to justify incorporating learning styles assessments into general educational practice," adding that "limited education resources would better be devoted to adopting other educational practices that have a strong evidence base." Pashler et al., *supra* note 31, at 105; *see also* Frank Coffield et al., *Learning Styles and Pedagogy in Post-16 Learning. A Systematic and Critical Review*, Learning and Skills Research Centre (2004); Bad Education: Debunking Myths in Education (Philip Adey & Justin Dillon eds., 1st ed. 2012).

34. Kirschner et al., *supra* note 5.

35. John Hattie, Visible Learning for Teachers: Maximizing Impact on Learning (1st ed. 2012).

36. John Hattie & Gregory C. R. Yates, Visible Learning and the Science of How We Learn (1st ed. 2013).

37. *Id.*

38. *See* Polly R. Husmann & Valerie Dean O'Loughlin, *Another Nail in the Coffin for Learning Styles? Disparities Among Undergraduate Anatomy Students' Study Strategies, Class Performance, and Reported VARK Learning Styles*, Anat. Sci. Educ. (2018) (leading the authors to ask: How many nails does that coffin need?).

39. Kirschner et al., *supra* note 5.

of learning, possessing "general knowledge" about the brain significantly predicted an increased belief in neuromyths.[40]

Unfortunately, Pandora's box has been open for thirty years. Misconceptions about learning abound. Many of these have found their way into classrooms, if not teaching scholarship. These extrapolations have intuitive appeal; simple but spurious solutions to complex problems of teaching and learning, and the very human need to differentiate and classify, are compelling.[41] Accounts of neuroscientists' responses and explanations to the members of the education community show that there is no quick fix. Indeed, subsequent enlightenment appears to produce dejection in the audience,[42] a reaction similarly described by William James in 1899.

Cultural conditions create the space for weedy ideas like learning styles and left brain-right brain theories to thrive.[43] "Scientific" explanations and brain images make even poorly defined ideas sound plausible.[44] The internet has delivered numbing amounts of information confirming popular, if problematical, notions of learning.

However, at the heart of the learning styles theory is the poignant promise of remedy. Good teachers are largely concerned with their students' learning. Well-meaning instructors believe that accommodating learning styles could help poorly performing students improve. Learners and instructors alike were encouraged to incorporate learning styles into self-help and teaching regimens. Students internalized these beliefs and declared themselves "visual" or other learners, and, like amateur astrologers, students applied the typologies to themselves and hoped for epiphany. Beneath the promise of these myths also lies tough philosophical questions: What is the point of education? Can thinking be taught? Are thinking skills transferable?

Neuromyths are part of the culture now. Like a game of telephone, oversimplified findings have led to distortions memorialized in a Babel of web pages, blog postings, news stories, magazines, and even journal articles. Various media representations of the science in turn influence a new generation of educators. A new century brings with it new fallacies. With our current emphasis on information-seeking and internet technologies, many law faculty have succumbed to the belief that students know when they are learning and are indeed the best judges of their own learning. However, researchers claim the idea of self-education is fallacious.[45] Students are not always able to control

40. Dekker et al., *supra* note 24.

41. Coffield et al., *supra* note 32.

42. Beyerstein, *supra* note 13.

43. Howard-Jones writes that neuromyths are "[m]isconceptions about the brain that flourish when cultural conditions protect them from scrutiny." Howard-Jones, *supra* note 4.

44. *See* Deena Skolnick Weisberg et al., *The Seductive Allure of Neuroscience Explanations*, 20 J. Cogn. Neurosci. 470, 477 (2007); *see also* David P. McCabe & Alan D. Castel, *Seeing is Believing: The Effect of Brain Images on Judgments of Scientific Reasoning*, 107 Cognition 343, 352 (2007).

45. Hyeon Woo Lee, Kyu Yon Lim & Barbara L. Grabowski, *Improving Self-Regulation, Learning*

their own learning, or determine if and when they are learning, especially in online environments.[46] It is also tempting to believe that our students, most of them digital natives, learn differently from the people who grew up before the internet. This myth is also refuted by neuroscience. The learning difference may be a result of technological pressures, which have wrongly influenced public perceptions: that students of this generation somehow learn differently from their forebears and should be taught differently.

No wonder it is so hard to give up the fallacies. They are ubiquitous, having been insinuated into everyday jargon and practice, including law, reemerging as a kind of folklore. The fallacies have become, to some extent, part of every teacher's prior knowledge. And like all lightly held, hasty ideas, these fallacies may keep us from making real change in our classrooms.

C. Why Do We Find Neuromyths Compelling?

Ironically, there is cognitive science behind our inclination to believe these fallacies. Belief is akin to identity, and an idea once internalized is shed only with resistance. People will find a way *to know* in what they have decided to believe. Cognitive scientists call the (illogical) predisposition to look for, interpret, and remember information according to one's own beliefs "confirmation bias."[47] The strength of prior beliefs also correlates with one's ability to change.[48] Belief perseverance,[49] a concept closely related to confirmation bias, is the tendency to hold on to wrong beliefs even after they have been disproved. Both confirmation bias and belief perseverance have implications for teaching and learning. What do we believe about learning? About teaching? About our students? These beliefs will drive our teaching practice.

Experts are not immune from biases. In two studies, research reports that agreed with scientists' prior beliefs were judged to be of higher quality than those that disagreed; the agreement effect was larger for general, evaluative judgments than for specific, analytical judgments.[50]

Strategy Use, and Achievement with Metacognitive Feedback, 58 Educational Technology Research & Development 629, 648 (2010); *see also* Handbook of Research for Educational Communications and Technology: A Project of the Association for Educational Communications and Technology (David H. Jonassen & Mary P. Driscoll eds., 2d ed. 2003).

46. Paul A. Kirschner & Jeroen J.G. van Merriënboer, *Do Learners Really Know Best? Urban Legends in Education*, 38 Educational Psych. 169, 183 (2013).

47. Raymond S. Nickerson, *Confirmation Bias: A Ubiquitous Phenomenon in Many Guises*, 2 Rev. of General Psych. 175, 220 (1998).

48. Annette Kujawski Taylor & Patricia Kowalski, *Naive Psychological Science: The Prevalence, Strength, and Sources of Misconceptions*, 54 The Psychological Record 15, 15-25 (2004).

49. C.A. Anderson, *Belief Perseverance*, *in* Encyclopedia of Social Psychology 109, 110 (Roy Baumeister & Kathleen Vohs eds., 1st ed. 2007),

50. Jonathan J. Koehler, *The Influence of Prior Beliefs on Scientific Judgments of Evidence Quality*, 56 Org. Behavior and Human Dec. Processes 28, 55 (1993).

Cognitive psychology can narrow the gap between brain science and education by synthesizing relevant neuroscience literature.[51] The shape of understanding of what we do not know will continue to shift our understanding of how people learn. And we should not blame faculty for attempting to find remedies for real and present classroom challenges. Natural interest speaks to a compelling need.[52]

If new pseudoscience claims have made its way into teaching practice, the hoary alternative is not a viable alternative. College classrooms, including law classrooms, can be stultifying. Despite a raft of studies showing that lecture should be supplemented with opportunities for practice,[53] law classrooms are known for their dependency on lecturing. As the aphorism goes, "The one doing the most talking is the one doing the most learning."[54]

In 2018, a field that unites teaching and brain science is nascent, dependent upon a new knowledge base.[55] Learning theorists have suggested that education concern itself with cognitive psychology, not neurobiology.[56] Neuroscience cannot guide educational practice, whereas cognitive psychology, which studies the mind and is less concerned with brain function, can. For example, neuroscience has not historically informed knowledge claims on the significance of early childhood the way cognitive, developmental or social psychology literature has.[57]

Teaching methods should be empirically confirmed, but which of us has time to do this? It may be hardest to extrapolate from a highly specific, challenging literature for what is essentially an art. Classrooms are highly complex, socio-cultural environments, not laboratories. Learning appears to be a confounding of variables.

51. Sarah-Jayne Blakemore & Uta Frith, The Learning Brain: Lessons for Education (1st ed. 2005).

52. Cayce J. Hook & Martha J. Farah, *Neuroscience for Educators: What Are They Seeking, and What are They Finding?*, 6 Neuroethics Publications 331 (2012).

53. Scott Freeman et al., *Active Learning Increases Student Performance in Science, Engineering, and Mathematics*, 111 Proc. Natl. Acad. Sci. 8410, 8415 (2014).

54. Alden S. Blodget writes: "That means that teachers get the best educations, while students get quality time with their iPods or text messages." Alden Blodget, *Lesson From a Tuned-Out Classroom: Talking Isn't Teaching*, WBUR (June 20, 2014), https://www.wbur.org/cognoscenti/2014/06/20/education-teachers-alden-blodget.

55. So-called Mind, Brain, and Education studies, *e.g.* Christina Hinton et al., *Mind, Brain and Education* (2012), http://www.howyouthlearn.org/pdf/Mind%20Brain%20Education.pdf; *see also* Jeffrey S. Bowers, *The Practical and Principled Problems With Educational Neuroscience*, Psychological Review (2016).

56. At the time, Bruer wrote: "We simply do not know enough about how the brain works to draw educational implications from changes in synaptic morphology. We do not know how synaptic change supports learning. There is a gaping chasm between our understanding of what happens to synapses as a result of experience and what happens or should happen in preschool or third grade." Bruer, *supra* note 16.

57. *Id.*

Law andragogy can begin with the healthy literature on cognitive psychology. Without a cognitive framework, teaching is fad-driven. It is also more efficient to focus on what students have in common than on their differences.[58] The base of knowledge about teaching and learning upon which to build a culture of teaching and learning in law is next examined through the concept of prior knowledge.

III. Something Old: Cognitive Principles and What They Can Tell Us About Teaching the Law

A. Prior Knowledge, Knowledge Transfer, Practice, Feedback, and Testing

Several time-tested cognitive principles that draw from cognitive psychology are useful for the law classroom. These principles include the role that prior knowledge, memory, practice, and feedback play in learning.

1. Prior knowledge

Most of us teach the way we were taught.[59] To any new situation we bring our "prior knowledge"—in other words, the lifetime of our experiences, memories, beliefs, and frameworks. Our prior knowledge largely determines our approaches to teaching and learning. The cognitive principle of prior knowledge is this: People learn new things by referencing what they already know.[60] The way we process and integrate new information affects how we think about and remember new knowledge. Activating prior knowledge acts as a hook to learning.[61]

The principle of prior knowledge is already used in the law classroom. One example is the use of analogies, which make implied relationships explicit and connect existing with future knowledge.[62] By connecting with our own prior knowledge, law faculty can structure curriculum to take advantage of incorrect prior knowledge such as misconceptions. The refutational approach[63] surfaces

58. *See* Jeroen J.G. van Merriënboer & John Sweller, *Cognitive Load Theory and Complex Learning: Recent Developments and Future Directions*, 17 Educational Psychology R. 147, 177 (2005); John Sweller et al., *Cognitive Architecture and Instructional Design*, 10 Educational Psychology R. 251, 296 (1998).

59. Thanks to Dr. Ji Son's telephone communication Apr. 5, 2018. "So much of teaching is cultural; we do what has been done to us; we believe what has been believed for us. Cultural baggage often attaches to our ideas of what teaching and learning are. For example, the best faculty often were terrific students, adept at a very traditional model of instruction." *See also* James W. Stigler & James Hiebert, The Teaching Gap: Best Ideas From the World's Teachers for Improving Education in the Classroom (2009).

60. John Bransford et al., *How People Learn: Brain, Mind, Experience, and School: Expanded Edition*, National Research Council (2000).

61. *Id.*

62. *See* Lindsey E. Richland, Osnat Zur & Keith J. Holyoak, *Cognitive Supports for Analogies in the Mathematics Classroom*, 316 Science 1128, 1129 (2007).

63. Patricia Kowalski & Annette Kujawski Taylor, *The Effect of Refuting Misconceptions in the Introductory*

a misconception in the classroom and then immediately counters it—one way to arrest misconceptions by creating "aha moments." So-called "concept maps," "knowledge surveys," and "concept inventories"[64] are other ways for students to link what they know with what they are learning, and to see themselves in the material—also useful for knowledge transfer. Concept maps and knowledge inventories ask students to assess their prior knowledge while also capturing information for instructors on student readiness.[65]

Prior knowledge is highly influential for learning. Issues arise, however, if our prior knowledge is wrong. To paraphrase one theorist, it is what we already know that determines what we see and understand, not the other way around.[66] Faculty and students alike have already constructed informal theories about the way they think things work by the time they come to school. Prior knowledge about teaching or (law) school does not make us better instructors or learners, especially if that prior knowledge is misinformed.

2. Knowledge Transfer

A second cognitive principle useful for law education is knowledge transfer. To learn and retain information, students must encode or move information from working memory (which can store only so much) to long-term memory to be stored for later retrieval.[67] But transfer is not about just the content of long-term memory, but how that knowledge is structured. For example, if knowledge exists in "schemas" (e.g., representations with slots and fillers), you are more likely to see transfer than when knowledge is too detailed and concrete.

Learning the law involves reconciling voluminous amounts of information. The field is notorious for inducing cognitive load. However, the transfer of knowledge or skills to a new problem requires both knowledge of the context of the problem and a deep understanding of the underlying structure of the problem. Understanding this latter framework is what distinguishes experts from novices.[68]

Psychology Class, 36 Teach. Psychol. 153, 159 (2009).

64. *See* Joseph Novak, Learning, Creating, and Using Knowledge: Concept Maps as Facilitative Tools in Schools and Corporations (2d ed. 2009); *see also* Edward Nuhfer & Delores Knipp, *The Knowledge Survey: A Tool for All Reasons*, 21To Improve the Academy 59, 78 (2003).

65. *Id*.

66. Paul Kirschner et al., *Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Nature of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching*, 41 Educational Psychologist 75, 86 (2006) [hereinafter Kirschner et al., *Why Minimal Guidance*].

67. John Sweller, *Cognitive Load During Problem Solving: Effects on Learning*, 12 Cognitive Science 257, 285 (1988); John Sweller, *The Worked Example: Effect and Human Cognition. Learning and Instruction*, 16 Learning and Instruction 165, 169 (2006).

68. Bransford et al., *supra* note 60.

Students are novices who cannot naturally intuit hidden structures or relationships prevalent in law. Faculty can help students to apprehend underlying structures in several ways. First, we can ensure students have enough background knowledge to contextualize a problem by checking for understanding. Checking for understanding can be done via elaboration, questioning, and asking students to explain their reasoning.[69] Faculty can also assign students to compare problems that look dissimilar but share the same structure (analogous reasoning).[70]

Novices do not benefit from minimal guidance.[71] Faculty can break up (scaffold) course materials using "worked examples," a stepwise demonstration of a procedure. Another way to decrease cognitive load is to model desired behaviors in front of students, and teach using examples.[72] Faculty may also try the "think-aloud method," in which we share our thinking processes aloud with students, an effective way to solve problems.[73] Abstract representations (metaphors) can be alternated with concrete examples to illustrate a concept; graphics, images, and sound can likewise illustrate the same idea; multiple modalities, referred to earlier, are effective ways to freshly represent content.[74] These teaching methods have personal impact on students.

Learning experiences need to be meaningful for the brain to retain information. One way to do this is to have students organize materials themselves, which in turn gives meaning to content.[75] Teaching students to ask better questions also works to solidify thinking and reveal understanding.[76] Storytelling is another highly effective method for problem-solving, as storytelling is a universally recognized form that organizes thinking in a way that everyone can relate to. The reason why stories are so effective is precisely

69. Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century (James Pellegrino & Margaret Hilton eds., 2012); *see also* Samuel B. Day & Robert L. Goldstone, *The Import of Knowledge Export: Connecting Findings and Theories of Transfer of Learning*, 47 Educational Psychologist 153, 176 (2012).

70. Richland, Zur & Holyoak, *supra* note 62.

71. Kirschner et al., *Why Minimal Guidance*, *supra* note 66.

72. Harold Pashler et al., *Organizing Instruction and Study to Improve Student Learning: A Practice Guide*, U.S. Dep't of Educ. (2007); *see also* Kirschner et al., *Why Minimal Guidance*, *supra* note 66.

73. Maarten W. van Someren et al., The Think Aloud Method: A Practical Guide to Modelling Cognitive Process (Knowledge-Based Systems) (1st ed. 1994).

74. Peter C. Brown, Henry L. Roediger III, & Mark A. McDaniel, Make It Stick: The Science of Successful Learning (1st ed. 2014) [hereinafter Make It Stick].

75. Mark A. McDaniel et al., *What Makes Folk Tales Unique: Content Familiarity, Causal Structure, Scripts or Superstructures?*, 20 J. of Experimental Psych.: Learning, Memory, and Cognition 169, 184 (1994).

76. Arthur C. Graesser & Brent A. Olde, *How Does One Know Whether a Person Understands a Device? The Quality of the Questions the Person Asks When the Device Breaks Down*, 95 J. of Educational Psych. 524, 536 (2003); *see also* Barak Rosenshine, Carla Meister, & Saul Chapman, *Teaching Students to Generate Questions: A Review of the Intervention Studies*, 66 Rev. of Educational Research 181, 221 (1996).

because of their connection to schemas (abstract representations) discussed earlier.[77]

3. Practice and Feedback

Feedback and practice also exert strong influences on learning.[78] Feedback, the information we provide to students that tells them whether or not they are taking the right approach, is the converse of instruction. In the classroom lecture, the learner may infer what s/he wants to, but feedback interrupts this process. Feedback may also be a two-way street; faculty may solicit feedback and students may also give feedback to faculty about whether they are learning. John Hattie, author of the aforementioned meta-meta study on learning, lists feedback as among the top ten forms of effective instruction.[79] Interestingly, feedback is less observed in classrooms than teachers report giving it.[80]

There are different types of feedback. Hattie's summary of effect sizes shows their impacts on learning.[81] The highest effect sizes, which include cues and reinforcement (1.10 and 0.95, respectively), involve students receiving feedback about a task and instructions about how to complete the task more effectively. Lower effect sizes are related to rewards (.31), punishment (.20), and praise (.14).[82] Praise and punishment turn out to be unhelpful for task improvement.[83] In other words, feedback can have both positive and negative impacts.

Effective feedback provides information on correct rather than incorrect responses and builds on changes from previous work. Effective feedback is also goal-specific. Feedback should give clear information that helps a student to progress to meet that goal. Feedback should also be presented carefully.[84] Finally, novices need immediate feedback, within days, not weeks.

Practice, like feedback, is also critical to learning and retention. However, like feedback, practice may be powerful or ineffective ("differentially

77. Richard C. Anderson, *Role of the Reader's Schema in Comprehension, Learning, and Memory*, 29 Learning to Read in American Schools: Basal Readers & Context Texts 243-57 (1984).

78. Hattie, *supra* note 35.

79. *Id.*

80. John Hattie & Gregory Yates, *Using Feedback to Promote Learning*, *in* Applying the Science of Learning in Education: Infusing Psychological Science into the Curriculum 45, 58 (Victor A. Benassi et al. eds., 2014) [hereinafter Applying the Science of Learning in Education].

81. John Hattie & Helen Timperley, *The Power of Feedback*, 77 Review of Edu. Research 81, 112 (2007).

82. Applying the Science of Learning in Education, *supra* note 80, at 45, 58.

83. *Id.* at 47.

84. Edward L. Deci et al., *A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation*, 125 Psychological Bulletin 627, 668 (1999).

effective"), so not all practice results in learning. How information is practiced determines improvement. [85]

Law instructors can build learning through practice in the following ways:

- **Spaced practice**. Instructors should practice repeating similar problems but space these problems over time. Distributing or spacing practice is superior to "massing" practice, whereby similar problems are grouped together and practiced as a block. Information spaced over time is learned more slowly than via massing, but leads to more durable learning and memory retention.

- **Interleaved practice** alternates different problem types and multiple topics over time. Think of this as alternating easy with difficult tasks. For example, students learn to brief a case the first week of law school, *i.e.*, parties, facts, rules, holding, and reasoning. But synthesizing multiple rules from precedent cases requires advanced critical thinking and practice, and can take up to a year for students to master. If students are assigned to brief a case three months after they first learn it, and after working with synthesizing rules from precedent, the case brief becomes second nature to the novice student within a short time. Briefing is a skill students can easily return to and feel a sense of accomplishment.

Interleaving naturally results in the spacing of similar problem types, so interleaved and spaced practice can be sequenced.

Another example of interleaved practice: Given some case (X), take a look at another four seemingly different cases; X could be used as a precedent for each of these. Recent research by Goldstone and Caravalho[86] suggests that if the four cases represent truly diverse examples that could all use case X as a precedent, blocking could be beneficial, as blocking enhances students' ability to appreciate similarity (underlying structure) across seemingly dissimilar cases.

4. Testing is not Anathema to Learning

Ironically, the best method to help retention is traditionally the most hated method: testing. However, testing does not mean the habitual law school cramming for the test (a form of massed practice)[87] or standardized (think

85. K. Anders Ericsson et al., *The Role of Deliberate Practice in the Acquisition of Expert Performance*, 100 Psychological R. 363, 406 (1993).

86. Paulo F. Carvalho & Robert L. Goldstone, *Putting category learning in order: Category structure and temporal arrangement affect the benefit of interleaved over blocked study*, 60 Memory & Cognition 481-95 (2014).

87. Make It Stick, *supra* note 74, at 47-48.

LSAT) assessment. Contrary to the current trend of maligning testing as a "dipstick" to measure learning, testing is a useful tool for learning. Testing can be broadly defined to include any activity, assignment, or assessment that allows students to "take charge of their own learning."[88] Testing can be a helpful form of metacognition, as it may produce self-awareness and directs attention to the process of thinking, which encourages goal-setting and monitoring.

As a retrieval practice, testing fortifies memory.[89] Successful retrieval practices that "interrupt forgetting,"[90] especially helpful for law, include short quizzes deployed immediately after reading a text or hearing a lecture, and student self-testing using flash cards or mnemonics. Retrieval processes produce what is known as the "Testing Effect"[91]—that is, better learning and remembering, as opposed to less effective methods such as rereading the text or highlighting.[92] While the testing effect has largely been studied along with memory, much of law (and related critical reasoning domains) is less about remembering accurately than about *applying* accurately. There are a few exceptions that examine the "testing effect" in relation to producing transfer.[93]

Taking a test also positively affects study habits and is good for regulating behavior (self-regulation). Regular (short) tests function as a type of formative assessment, as practice is involved. Low-stakes quizzes are nonthreatening and help students to monitor their progress. After taking a test, students who spend more time restudying material they missed learn more from the testing process than do peers who study and restudy material without being tested.[94] Reviewing test results is also a form of feedback.[95] Effortful retrieval results in stronger learning and retention; repeated retrieval makes memories more durable and produces knowledge that can be retrieved more readily, in more varied settings, and applied to a wider variety of problems.[96]

88. *Id.* at 30.; *see also* Pooja K. Agarwal et al., *The Value of Applied Research: Retrieval Practice Improves Classroom Learning and Recommendations From a Teacher, and Principal, and a Scientist*, 24 Educational Psych. Rev. 437, 437-438 (2012).

89. Make it Stick, *supra* note 74, at 19.

90. *Id.*

91. *Id.* at 28.

92. *Id.* at 3.

93. Andrew C. Butler, *Repeated Testing Produces Superior Transfer of Learning Relative to Repeated Studying*, 36 J. of Experimental Psych.: Learning, Memory & Cognition 1118 (2010); Ji Y. Son & Mariela J. Rivas, *Designing clicker questions to Stimulate Transfer*, 2 Scholarship of Teaching & Learning in Psych. 193, 193-207 (2016).

94. Butler, *supra* note 93; Son & Rivas, *supra* note 93, at 193-207.

95. Butler, *supra* note 93; Son & Rivas, *supra* note 93, at 193-207.

96. Butler, *supra* note 93; Son & Rivas, *supra* note 93, at 193-207.

IV. Something Blue: Metacognition Increases Knowledge

A. Which Habits of Mind Does Law Value?

One way of thinking about how we may engage student learning in law is to consider the habits of mind that attorneys prize. Like all disciplines, law shares ways of knowing that structure thinking and practice in often hidden ways. Academic disciplines are distinguished by their unique paradigms, which reveal themselves in different values and concerns.[97] These concerns should be made explicit for law students. For example, law, a mature discipline and "soft" applied field of study, tends toward neither convergent nor divergent points of view.[98] In other words, there is healthy disagreement in law. Naming such dispositions may shed light on techniques effective for legal practice, which can then be structured using various cognitive principles discussed in this paper. Traits that are most valued should be embedded in classroom learning experiences.

For example, the ability to ask good questions is especially valued in law practice as discussed in Part IV, below. Helping students to learn what makes for efficient (and less than efficient) legal questioning should be something embedded into coursework.[99] Other habits worth structuring into law curriculum include persistence (grit), accuracy, and exactness of expression, communicating with clarity, and responsible risk-taking.

Habits of mind and dispositions unique to law reflect expert practice. The ability to regulate practice is one of the things that distinguishes novice from expert learners. Novices may be helped by metacognition[100] or the development of self-awareness. Law education is also improved and enhanced by identifying the metacognitive structures and barriers to learning and by reengineering our learning methods to adapt to our teaching processes, as discussed in Part I.

Metacognition, or "thinking about thinking,"[101] refers to the self-monitoring by an individual of his or her own unique cognitive processes: having both

97. See Anthony Biglan, *Relationships Between Subject Matter Characteristics and the Structure and Output of University Departments*, 57 J. of Applied Psych. 204, 213 (1973); *see also* Tony Becher & Paul Trowler, Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Discipline (2d ed. 2001); *see also* Tony Becher, *The Disciplinary Shaping of the Profession*, in The Academic Profession: National, Disciplinary, and Institutional Settings (Burton R. Clark ed., 1987).

98. *See* Tony Becher & Paul Trowler, Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Discipline (2d ed. 2002).

99. See Dan Rothstein & Luz Santana, Make Just One Change: Teach Students to Ask Their Own Questions (2011).

100. Bransford et al., *supra* note 60.

101. John H. Flavell, *Metacognition and Cognitive Monitoring: A new area of Cognitive-Developmental Inquiry*, 34 American Psychologist 906, 906-911 (1979).

awareness and control over one's own learning and thinking.[102] Metacognition focuses on reflexivity in thought processes—that is, the development of self-reflective critical reasoning that is at the very core of legal education.[103] In learning, awareness and control of cognitive processes permit individuals to plan and prepare, monitor learning progress, and reflect on knowledge.[104] Robin Fogarty writes, "metacognitive strategies provide the necessary format to promote learning not just for a test, but for a lifetime—not just for recall, but for lifelong logic and reasoning."[105]

Law educators, by profession and training, tend to be somewhat disconnected metacognitively, and thus attached to "tradition," as in rote teaching methods that may not lead to successful learning in our students. We consciously or unconsciously eschew the brain science that supports the way we actually learn in lieu of standing firm on our training and experience. In our defense, the practice of law is a busy one, with much responsibility and many deadlines. The legal education setting can mirror law practice. For professors to learn, adopt, and implement new teaching methods is just as time-consuming as the learning process for our students. And confusing, because, some of our old-fashioned traditions are andragogically effective, and worth retaining (see Part IV).

In our teaching tradition, we stand as experts at the front of the classroom and give a long lecture on a memorized topic. Sometimes we stand behind a power-inducing podium, other times we bring our sage presence to the masses by walking around the room and gesticulating. While we talk, our students transcribe our lecture word for word,[106] either in handwriting[107] or on their laptops.[108] Although numerous studies reveal that lecture to transcription does

102. Anthony S. Niedwiecki, *Lawyers and Learning: A Metacognitive Approach to Legal Education*, 13 Widener L. Rev. 33, 35 (2006).

103. Barry J. Zimmerman, *Self-Regulated Learning and Academic Achievement: An Overview*, 25 Educ. Psychologist 4, 5 (1990) (noting that students with strong metacognitive skills can "plan, set goals, organize, self-monitor, and self-evaluate at various points during the process of acquisition" and that doing so allows them to be "self-aware, knowledgeable, and decisive in their approach to learning").

104. *Id.*

105. Robin J. Fogarty, How to Teach for Metacognitive Reflection xvii (1st ed. 1994) (emphasis added).

106. Susan M. Dynarski, *For Better Learning in College Lectures, Lay Down the Laptop and Pick Up a Pen,* Brookings (Aug. 10, 2017), https://www.brookings.edu/research/for-better-learning-in-college-lectures-lay-down-the-laptop-and-pick-up-a-pen/.

107. Handwriting is more and more rare but more effective for learning. *See generally* Pam A. Mueller & Daniel M. Oppenheimer, *The Pen is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking*, Psych. Sci. 1-10 (Apr. 23, 2014).

108. *Id.* at 8. Laptop users tend to perform less successfully on their exams than those students who handwrite their notes.

not result in learning,[109] we continue this teaching platform because it is "what we know," or "how we learned," *to wit*: educational hazing.

Adults learn differently from children,[110] however, and, in fact, not as easily: Adult learning is slower; we are stubbornly comfortable in our old learning habits, and our prior knowledge can act as a barrier to learning.[111] We are also afraid to fail.[112] These deficits hold for law educators as well as for law students.

B. Prior Knowledge Revisited: It Hurts

As shown earlier, the explanation for our reluctance to change our teaching methods is that we are tied to our prior knowledge despite evidence that proves our prior knowledge has a good chance of being wrong. The extent of our capability of "new learning" is determined by what we already know about a topic or related topic.

Our prior knowledge affects our ability to integrate new knowledge in either a positive or negative manner: positive if the pre-existing knowledge is correct and consistent with the new information, or negative if it is full of misconceptions or conflicts with the new information."[113] Like us, our students build on what they already know and have come to understand through formal and informal experiences.[114] Professors and students alike, like all humans, develop attitudes and beliefs as we progress through life.[115] Thus, we may bring confusion to the classroom, both behind and in front of the podium. And so, we "check" our own prior knowledge in our teaching against our students', acknowledging that students possess different prior knowledge.[116]

109. Dynarski, *supra* note 106.

110. Deanna Kuhn & Maria Pease, *Do Children and Adults Learn Differently?*, 7 J. of Cognition & Dev. 279, 289, 293 (2006). In a study of learning differences between children and adults, the researchers concluded that older participants are more likely to "employ a metalevel executive that allows them to simultaneously maintain dual representations, one a representation of their own understanding (of the relations they expect or see as most plausible) and the other a representation of the new information they are being asked to register."

111. *Id.* at 291 ("To the extent to which an individual holds detailed, elaborate, vivid, and affectively potent existing theories, which a familiar context facilitates, a weak executive operator makes it more difficult to maintain the needed dual representations (of theory and evidence). A less potent representation on the theory side may give the two representations a better chance to coexist while an executive seeks to coordinate them.")

112. *Id.*

113. Marilla Svinicki, *Essay on Teaching Excellence Toward the Best in the Academy, What They Don't Know Can Hurt Them: The Role of Prior Knowledge in Learning*, 5 The Prof. & Org. Dev. Network in Higher Ed. (1993-94).

114. Susan Ambrose et al., How Learning Works: Seven Research-Based Principles for Smart Teaching (1st ed. 2010).

115. *Id.*

116. Pop culture references and the frustration at different knowledge is a perfect example. From a discussion on an academic listserv: "Lots of people on this list have cautioned against using pop cultural references that are too old or too obscure for the current generation of

In our law education classrooms every day we use terms and concepts about which students have no prior knowledge, often without providing an adequate context for interpretation.[117] When such terms are used at the rapid pace of an expert, students may either complain that terminology is "jargon" or, more often in law school, specifically, adopt the jargon into their vernacular without fully understanding the meaning (see, e.g., legalese). The overuse of concepts that are unfamiliar or that have multiple meanings leave gaps in student ability to process new information. Think of the way you may skip over a word you do not know when you are reading and potentially miss the entire meaning of the piece if you do not take the time to look up that word. Or what you do when you are reading in or learning a foreign language.[118] New concepts are foreign, and old knowledge dies hard.

Prior knowledge also affects how a student organizes new information.[119] A goal of learning is to incorporate new information into the existing organization of memory.[120] A student uses that existing structure to assimilate new information. For example, in the absence of any strong signals to the contrary, a student who was a history major before matriculating to law school will likely organize new historical information chronologically, because that is one way learning history is organized. Law professors trying to organize around recursive conceptual structures must fight against the history major's tendency to see everything as happening in a straight timeline.[121]

To prevail in our learning objectives, we could assert the recursive process surrounding prior knowledge by assessing both our own and our students' prior knowledge.[122] We might begin with a low-stakes quiz or essay to ascertain the skills and knowledge students already possess. Short assessments are a

students. I thought I had avoided that problem with today's class, but I guess not: I was doing an exercise on identifying "elements" and wanted to make the point that sometimes you have to predict what a future court will do with a question of first impression. So I put up a slide asking students to identify the "elements" of a transporter. The slide had an image of the transporter pad from a recent iteration of the Enterprise, and had the Star Trek theme music playing in the background to get the students into the proper frame of mind to conjure up the things that a transporter would have to have in order to function. I was looking for a list of four elements: (1) a device to map your molecules, (2) a device to disassemble you, (3) a device to move your molecules to the planet's surface, and (4) a device to reassemble you. If the machine lacked any of these elements, you couldn't call it a transporter. Most of the students got into it quickly and had fun with it. But then an international student from China, sitting in the back, raised his hand and asked, 'What is a transporter? Is it an airplane?'"

117. Ambrose et al., *supra* note 114, at 38.

118. My (Deborah Borman's) dad often told me the story of his day in high school Spanish class when he was called on and proudly proclaimed aloud, "Estoy sentado en una tinta," "I am sitting on an inkwell," rather than "I am sitting on a chair": "Estoy sentado en una silla."

119. Svinicki, *supra* note 113.

120. *Id.*

121. *Id.*

122. Ambrose et al., *supra* note 114, at 10-39.

form of two-way feedback: They reveal students' understanding of concepts to instructors, and they give students a heads-up on definitions of terminologies that students are expected to know.[123]

C. Engage in Reflection as Metacognition

Not every method we learned and then subsequently teach leads to the best results for learning and retention of material. Shedding our preconceptions about learning to marry successful concepts with our teaching requires a calm and meditative approach to what we know, how we know it, what can be saved, and what must be discarded. Some of what we know about teaching and learning is contrary to successful education methods.[124] Reflection is one way of monitoring our teaching state.

Activating our "blue," reflective state opens our interpretive abilities to see alternatives;[125] when we integrate new meanings and concepts toward expanding our knowledge and unstick our adherence to disproved concepts about teaching and learning, the result is better learning. We check for resistant, faulty, prior knowledge through self-reflection. Reflections give both faculty and students the opportunity to take charge of their own learning and activate their own metacognition: reflecting on their learning processes, assessing their learning.

Reflection in teaching and learning is not a new practice. John Dewey (1859-1952) defined reflective thought as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends."[126] Dewey delineated five phases or aspects of thinking, which we summarize below:

1. Suggestions, or the inhibition of tendency to act, to pursue what ever suggestion arises from the situation by stopping to consider more than one course of action;

2. Intellectualization, the definition of a problem and the raising of questions about the nature of the problem and possible solution;

3. The hypothesis, the development of the guiding idea based on observation and previous knowledge;

123. *Id.*

124. Unsuccessful study habits, e.g., "massed practice," highlighting, discussed *infra*.

125. William H. Gass examined the accidental and conflicting ways in which meanings are historically attached to words: "The blue lucy is a healing plant. Blue john is skim milk. Bluebacks are confederate bills. Blue bellies are Yankee boys. Mercurial ointment, used for the destruction of parasites, is called blue butter, although that greenish-blue fungus we've all seen cover bread is named blue-mold instead." William H. Gass, On Being Blue: A Philosophical Inquiry 19 (1976).

126. John Dewey, How We Think 118 (1st ed. 1933). Dewey stressed the functional relationship between classroom learning activities and real-life experiences and analyzed the social and psychological nature of the learning process.

4. Reasoning, the development of the hypothesis by applying knowledge and by developing the linkages in the sequence of ideas;

5. Testing the hypothesis in action,or verification through further observation or experimentation in which the problem is solved or a new problem is presented.[127]

Different orientations for reflective practice influence how to conceptualize the role or emphasis of reflection in the life of the teacher.[128] The generic orientation is one in which any reflection is good, because teachers can then be more intentional and deliberate in their thinking about teaching.[129] Growth can result from reflection on "the ordinary day-to-day experience of instructing students in classrooms . . . (which) . . . elevates the activity of instruction from the level of mundane drudgery to one that has the potential to educate practitioners, thereby changing and improving their practice."[130]

Schön, who highlighted the value of reflection in helping professionals learn about and improve their practices, stimulated the recent re-interest in reflection in education.[131] Schön introduced the emotional component to reflection: The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation he finds uncertain or unique, then reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behavior.[132] Reflection serves as a mechanism for turning experience into knowledge about teaching.[133] Ongoing use of the process of reflection is essential for building knowledge, and increasing knowledge increases one's ability to use reflection effectively and to develop as a teacher.[134] Practical reflection focuses on improving actions in a particular course or class. Strategic reflection involves an attention to generalized knowledge or approaches to teaching that are applicable across contexts. Epistemic reflection represents a cognitive awareness of one's reflective processes, as well as how they may impede reflection and enactment of plans.[135]

127. *Id.* at 199, 209. *See also*, Dwight E. Giles, Jr. and Janet Eyler, *The Theoretical Roots of Service-Learning in John Dewey: Toward a Theory of Service Learning*, 1 Michigan Journal of Community Service Learning 80 (1994) (elucidating Dewey's original list, and noting that Dewey did not consider this list linear).

128. Lynn McAlpine & Cynthia Weston, *Reflection: Issues Related to Improving Professors' Teaching and Students' Learning*, 28 Instructional Science 363, 385 (2000). The authors delineate five orientations: academic, social efficiency, developmental, social reconstructionist, and generic. The authors' research focuses on the generic traction orientation.

129. *Id.*

130. *Id.*

131. Chris Argyris & Donald Schön, Theory in Practice: Increasing Professional Effectiveness (1st ed. 1992).

132. *Id.*

133. *Id.*

134. *Id.*

135. *Id.*

These strategies of self-regulated learning (self-assessment) and self-awareness (reflection) in the education process build the foundation for the skills needed in legal practice: We must understand our personal values and their influence on the client relationship (our professional identity). As attorneys we must know where our feelings end and those of our clients begin. We must realize how we influence outcomes, recognize and manage our internal dialogue, and understand and control personal defense mechanisms. We must know when and how clients are reacting to our personal style, and modify our behavior for success in practice. Critical reflection is good professional practice for attorneys.

V. The Silver Sixpence: A Successful Legal Education Method

> At lunch, Socrates voiced his misgivings.
>
> "Should I be doing all of this?" he asked. "I mean, is the unexamined life even worth—"
>
> "Are you being serious?" interrupted Jackie. "Do you want to be a star philosopher or do you want to go back to waiting tables?"
>
> * * *
>
> It was shortly after that fateful lunch that the backlash began. Socrates's constant questions had become intolerable to many of the Greek elite. Still, as his Publicist had promised, he had become a brand. Imitators all over Athens were now practicing the new ***Socratic Method***. More and more young people were asking each other questions and doing it with Socrates's patented smart-assy tone. A few days later, Socrates was brought to trial and charged with corrupting the youth.[136]

Since time immemorial, when he forced students to "examine their unexamined lives,"[137] Socrates has been getting a bad rap. The Socratic method, one of the mainstays of legal education since the dawn of legal education,[138] has been under attack since its implementation.[139] Among the

136. Demetri Marti, This is a Book 34, 35 (1st ed. 2011).

137. Plato, The Apology of Socrates.

138. Christopher Columbus Langdell introduced the case method of teaching at Harvard Law School in 1870, dramatically altering the course of legal education in the United States. *See* Russell L. Weaver, *Langdell's Legacy: Living with the Case Method*, 36 Vill. L. Rev. 517, 518 (1991).

139. *See, e.g.*, The Centennial History of the Harvard Law School 1817-1917 365, 371 (1918) (listing bibliography of late-nineteenth-century and early-twentieth-century writings for and

current complaints are that the scientific methods espoused by Langdell that formed the basis for his teaching method are now outmoded.[140] Students object to the Socratic method as obfuscating.[141] Historically, critics lambaste the Socratic method as subjecting students to public degradation, humiliation, ridicule, and dehumanization.[142]

This criticism notwithstanding, the Socratic method employs many of the cognitive principles discussed in this paper: The Socratic method uniquely leverages prior knowledge, engages students in real-time practice and feedback, and incorporates testing as a social learning experience that is personally meaningful for students. Proponents generally agree that the Socratic method provides many benefits to teaching and learning, including the ability of professors to teach large bodies of students in an active manner;[143] the development of cognitive skills, as in teaching students to "think like a lawyer";[144] the ability to help students hone their verbal communication skills;[145] and proof that asking critical questions results in good analytical writing.[146] The Socratic method at its best is an example of one education technique that law education does particularly well: teaching students to dialogue by increasing their self-awareness and practice. The Socratic method is a deeply metacognitive skill.

against the case system and Langdell's Socratic method).

140. Nancy Cook, *Law as Science: Revisiting Langdell's Paradigm in the 21st Century*, 88 N.D. L. Rev. 21 (2012).

141. Students believe professors are trying to "hide the ball." *See* Weaver, *supra* note 138, at 518.

142. *See* Marina Angel, *Women in Legal Education: What It's Like to Be Part of a Perpetual First Wave or the Case of the Disappearing Women*, 61 Temp. L. Rev. 799, 810 (1988) ("[Giving the wrong answer subjected a student to ridicule and torture . . . ."); Maria L. Ciampi, *The I and Thou: A New Dialogue for the Law*, 58 U. Cin. L. Rev. 881, 882 (1990) ("The law school method of teaching, largely based on some form of the Socratic method, also plays an important role in the dehumanization process [of law students]."); Suzanne Dallimore, *The Socratic Method—More Harm than Good,* 3 J. Contemp. L. 177, 182 (1977) ("The Socratic method has a severely negative psychological impact."); Robert Stevens, *Law Schools and Law Students*, 59 Va. L. Rev. 551, 638 (1973) (reporting that students often complain that the method demeans and degrades students).

143. *See* Elizabeth Garrett, *Becoming Lawyers: The Role of the Socratic Method in Modern Law Schools*, 1 Green Bag 2nd 199, 201-02 (1998) (reviewing Lani Guinier, Michelle Fine & Jane Balin, Becoming Gentlemen: Women, Law School, and Institutional Change (1997)); Gerald F. Hess, *Principle 3: Good Practice Encourages Active Learning*, 49 J. Legal Educ. 401, 406 (1999).

144. *See* James R. Beattie, Jr., *Socratic Ignorance: Once More into the Cave*, 105 W. Va. L. Rev. 471, 493-94 (2003); Garrett, *supra* note 140, at 201; Edward D. Ohlbaum, *Basic Instinct: Case Theory and Courtroom Performance*, 66 Temp. L. Rev. 1, 8-9 (1993); *see also* James E. Moliterno & Fredric I. Lederer, An Introduction to Law, Law Study and the Lawyer's Role 173 (2d ed. 2004) (stating that the primary goal of the Socratic method is to "teach students to think").

145. Jeffrey D. Jackson, *Socrates and Langdell in Legal Writing: Is the Socratic Method A Proper Tool for Legal Writing Courses?*, 43 Cal. W.L. Rev. 267, 273-74 (2007).

146. Mary Kate Kearney & Mary Beth Beazley, *Teaching Students How to "Think Like Lawyers": Integrating Socratic Method with the Writing Process*, 64 Temp. L. Rev. 885 (1991).

The Socratic method is not a curriculum, but rather contributes to curriculum.[147] Despite perennial criticism, the "basic science" approach of the Socratic method was found to be an improvement over the original lecture-textbook method of teaching.[148] A professor utilizing the Socratic approach helps to sharpen students' minds by honing their analytical skills. Through Socratic dialogue students read cases, extrapolate significant rules and the court's analysis, and articulate their understanding of the rules of law and judges' policy considerations.[149] Langdell theorized that the teacher-student interaction encouraged by the Socratic method produced better lawyers than teaching by the lecture-textbook method.[20]

A. The Importance of the Dialogue

The Socratic method effectuates the quintessential evocative mode of a law curriculum: the question and answer of the dialogue.[150] Dialogue is a form of reflective thinking or inquiry that requires a certain communion between listener and speaker: an inquiry with the purpose of pursuing "truth" or progressing toward understanding or meaningfulness.[151]

Dialogue is "no mere conversation."[152] The distinction is illustrated through Chesters's scene of three friends chatting in a café: Three friends meeting at their favourite café, deeply immersed in each other's stories, which move from their relationships with family and friends in common, to their joys and sorrows, future employment prospects, and opinions on current affairs. There is, among other things, laughter, friendly banter, and occasional expressions of agreement and disagreement. As the purpose of their meeting is to share conversation over a cappuccino or Earl Grey tea, the mood is more likely to be one of offering support, encouragement, or a shoulder to cry on. This café conversation scenario, of course, does not discount the possibility of the friends engaging in more structured conversation, but it is unlikely to lead to an extended dialogue whereby assumptions are examined and disagreement is valued as a catalyst for further inquiry.[153]

When kept to mere conversation the exchanges aim for equilibrium. However, as the conversation begins to explore disagreement and eventually becomes a dialogue, the aim is for *dis*equilibrium, creating opportunities for a

147. Sarah Davey Chesters, The Socratic Classroom: Reflective Thinking Through Collaborative Inquiry 5 (2012).

148. Cynthia G. Hawkins-León, *The Socratic Method-Problem Method Dichotomy: The Debate over Teaching Method Continues*, 1998 B.Y.U. Educ. & L.J. 1, 5 (1998).

149. *Id.*

150. Donald G. Marshall, *Socratic Method and the Irreducible Core of Legal Education*, 90 Minn. L. Rev. 1, 8 (2005).

151. *Id.* at 11.

152. Chesters, *supra* note 147, at 13.

153. *Id.*

renewed understanding that comes from difference.[154] Disequilibrium brings new understanding to the topic under discussion, and at the conclusion of the dialogue equilibrium may again be restored. In an inquiry it is our disagreements as well as our agreements that shape the dialogue. In a dialogue, we aim for a renewed understanding that comes from exploring ideas in disequilibrium. In this process, we reconstruct our previous knowledge.[155]

The lively dialogue practiced in the classroom is the discourse of the law. To learn to be able to participate constructively in the "legal conversation," which is dialogue, not social conversation, is essential to legal practice.[156] Dialogue is the method by which lawyers' problem-solving skills and critical-thinking attributes are acquired. Reflective thinking and inquiry are the essence of good lawyering.

Through dialogue, students acquire the habit of rigorous and critical analysis of the arguments they hear,"[157] "to learn to reason by analogy,"[158] and further to know "the practice of assessing and revising their own ideas and approaches in light of new information or different reasoning"[159] revealed through the discourse, as well as demanding that students think and listen critically.[160] A student who is appropriately challenged in a Socratic context learns that unexamined beliefs, assumptions, glib response, or clever retort alone are poor grounds to stand on and cannot be the basis for understanding the effect of the law on those subject to it, or be the source of sound solutions to the varying problems that the student will be asked to resolve as a lawyer.[161]

Critical thinking is driven not by answers but by questions.[162] Questions define tasks and express problems and issues.[163] Deep questions drive our thought underneath the surface of things, forcing us to deal with complexity:

> Questions of information force us to look at our sources of information as well as at the quality of our information. Questions of interpretation force us to examine how we are organizing or giving meaning to information and to consider alternative ways of giving meaning. Questions of assumption

154. *Id.*

155. *Id.*

156. *Id.*

157. Joseph A. Dickinson, *Understanding the Socratic Method in Law School Teaching After the Carnegie Foundation's Educating Lawyers*, 31 W. New Eng. L. Rev. 97 (2009).

158. *Id.*

159. *Id.*

160. *Id.* at 105.

161. *Id.*

162. Linda Elder & Richard Paul, *The Role of Socratic Questioning in Thinking, Teaching, and Learning*, 71 The Clearing House 297, 301 (1998).

163. *Id.*

> force us to examine what we are taking for granted. Questions of implication force us to follow out where our thinking is going. Questions of point of view force us to examine our point of view and to consider other relevant points of view. Questions of relevance force us to discriminate between what does and what does not bear on a question. Questions of accuracy force us to evaluate and test for truth and correctness. Questions of precision force us to give details and be specific. Questions of consistency force us to examine our thinking for contradictions. Questions of logic force us to consider how we are putting the whole of our thought together, to make sure that it all adds up and makes sense within a reasonable system of some kind. [164]

A focus on answers defies critical thinking. Answers often signal a full stop in thought.[165] Only when an answer generates a further question does thought continue its life as such. That is why only students who ask questions are thinking and learning.[166] Unfortunately, most students tend to ask virtually none of the thought-stimulating questions delineated above, instead sticking to dead-on-arrival questions like "is this going to be on the test?" or questions that imply the desire not to think.[167]

To develop critical inquiry abilities, law students should not only respond to professor prompts, but also learn how to formulate their own questions. The formulation of questions is a sound strategy for training lawyers,[168] and the andragogy[169] of dialogue is "the irreducible core of legal education."[170]

Thus, cold-calling on students, once prevalent in law classrooms, is important. Although cold-calling can become punitive in practice, it does not have to be. When done humanely, cold-calling is quite effective.[171] For example: Students can practice their critical thinking and receive immediate feedback;

164. *Id.* at 297, 98.

165. *Id.*

166. *Id.*

167. *Id.*

168. Dickinson, *supra* note 157, at 99.

169. We use andragogy, the science of adult education, to describe law school teaching, as opposed to pedagogy, which describes the science of teaching children.

170. Marshall, *supra* note 150.

171. *See, e.g.*, Thomas A. Angelo & K. Patricia Cross, Classroom Assessment Techniques: A Handbook for College Teachers (2d ed. 1993); Elizabeth F. Barkley, Learning Assessment Techniques: A Handbook for College Faculty (2016); Elise J. Dallimore et al., *Impact of Cold-Calling on Student Voluntary Participation*, 37 J. of Management Educ. 305-41 (2012); Jay R. Howard & Maryellen Weimer, Discussion in the College Classroom: Getting your Students Engaged and Participating in Person and Online (2015); Jenni Ingram & Victoria Elliott, *A Critical Analysis of the Role of Wait Time in Classroom Interactions and the Effects on Student and Teacher Interactional Behaviours*, 46 Cambridge J. of Educ. 1-17 (2016).

thinking and verbal communication are useful job skills in law practice; students learn that they need to be active in class, take responsibility for their learning, and contribute to their own (and their classmates') education.[172]

Socratic dialogue teaches students to respond to questions, ponder positions, and ask follow-up questions, leading to the formulation of ideas, inventions, and better solutions.[173] When posing questions to students that force them to confront the weaknesses of each position, the professor using the Socratic method ultimately trains students to assess the strength of legal arguments.[174]

While some of our students may "never enter a courtroom as advocates, . . . they will counsel clients, devise strategies for legal challenges, draft legislation, advise state and federal lawmakers, or run businesses."[175] By pursuing the dialectic exposition of the law through facilitated dialogue between teacher and student, and student and student, law professors prepare their students for the practice of law.[176]

B. The Socratic Dialogue Is Collaborative Learning

We show here that Socratic pedagogy at its core is naturally a deeply reflective form of education, in which thinking is understood as a process of inquiry. In an inquiry, our disagreements as well as our agreements shape the dialogue. The backward and forward movement of agreement and disagreement is what lends rigor to an inquiry as it moves from convergent to divergent thinking through the course of the dialogue.[177] The aim of Socratic pedagogy is not to discover truth, however, at least not in the sense of discovering certainty. Rather, Socratic pedagogy is an educational process, which has as its foundation the principle that all knowledge is fallible and stands open to future revision.[178] The Socratic method is democratic.[179]

The idea of fallibility is central to the origins of dialogue. Philosopher Charles Peirce rejected the idea of Cartesianism—that the mind is the key to unlocking knowledge, and therefore that truth and certainty are to be found in the individual consciousness.[180] Peirce recognized the value of exploring

172. Mitchell M. Handelsman, *The Case of Classroom Cold Calling: What Do You Think?*, Psychology Today (Nov. 26, 2013) https://www.psychologytoday.com/us/blog/the-ethical-professor/201311/the-case-classroom-cold-calling-what-do-you-think.

173. Wendy Puriefoy, *Foreword*, *in* Dan Rothstein & Luz Santana, Make Just One Change: Teach Students to Ask Their Own Questions ix (2011).

174. Orin S. Kerr, *The Decline of the Socratic Method at Harvard*, 78 Neb. L. Rev. 113, 117 (1999).

175. Garrett, *supra* note 143, at 207.

176. *Id.*

177. *Id.*

178. *Id.*

179. Rothstein & Santana, *supra* note 99, at 1.

180. Chesters, *supra* note 147, at 37, *citing* Michael J. Paradales & Mark Girod, *Community of Inquiry:*

disagreement and agreement with others, emphasizing collaborative thinking and knowledge derived from "communities of inquiry": Individually, we cannot reasonably hope to attain the ultimate philosophy we pursue; we can only seek it for the community of philosophers. Thus, if disciplined and candid minds carefully examine a theory and refuse to accept it, this ought to create doubts in the mind of the author of the theory himself.[181]

Peirce asserted that dialogue and thinking collaboratively are not only positive ways of thinking, but absolutely necessary to the acquisition of knowledge and understanding, and essential if we are to arrive at "truth" at all. In a collaborative dialogue, ideas are under constant scrutiny by a community of inquirers, the "jury to ideas and hypotheses" constantly examining and reexamining to bring the group closer to knowing.[182] Once all ideas are tested against counterarguments, the group may be confident that it has arrived at truth and reality: "The opinion which is fated to be ultimately agreed upon by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real."[183]

It is only as a community of inquirers that we may uncover truth,[184] and the classroom provides the perfect truth incubator. Like Peirce, Lev Vygotsky realized the necessity for collaborative thinking in education. A proponent of social constructivism, Vygotsky posited that "scaffolding"—through interaction with both members of the wider community and classroom peers—enhanced children's individual achievements,[185] and that this "conceptual and reasoning space [is one that] children can operate with help from a group, but are not

Its Past and Present Future, 38 Educational Philosophy & Theory 299, 300 (2006).

181. *Id*.

182. Paradales & Girod, *supra* note 180, at 301.

183. Chesters, *supra* note 147, at 38.

184. *Id*.

185. Soviet psychologist and social constructivist Lev Vygotsky (1896-1934) developed the theory of the zone of proximal development (ZPD), or the difference between what a learner can do without help and what he or she can do with help. The concept provides that a child follows an adult's example and gradually develops the ability to do certain tasks without help or assistance. ZPD presents it as the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers. L.S. Vygotsky, Mind in Society: Development of Higher Psychological Processes (Michael Cole et al. eds., revised ed. 1978). Vygotsky, among other educational professionals, sees the role of education as providing children with experiences that are in their ZPD, thereby encouraging and advancing their individual learning. Laura E. Berk & Adam Winsler, Scaffolding Children's Learning: Vygotsky and Early Childhood Education (1995). Scaffolding is a process through which a teacher or more competent peer gives aid to the student in her/his ZPD as necessary, and tapers off this aid as it becomes unnecessary, much as a scaffold is removed from a building during construction. "Scaffolding refers to the way the adult guides the child's learning via focused questions and positive interactions." *Seeing the Child, Knowing the Person*, *in* William Ayers, To Become a Teacher: Making a Difference in Children's Lives 52 (1995).

capable of operating in on their own."[186] Vygotsky coined the term "community of learners" to describe how different members of the wider community can contribute to student learning.[187] If the contributions are cultivated from a diverse range of people, then learning is broadened in much the same way that communities of inquiry use different ideas and views to shape the dialogue to achieve outcomes better than inquiring alone would produce.[188]

C. Teaching the New Socratic Dialogue: Question Formulation

The efficacy of the Socratic method for the development of skills is thus essential to preparing students to meet the varying roles lawyers are called upon to fulfill in our professional lives.[189]

Properly executed, Socratic instruction "maximize[es] learning by encouraging participation in the process of discovery, including, most significantly, discovery of the dialogue as a means of autonomous learning."[190] The good Socratic instructor demonstrates "genuine respect for classroom space and time, for the dialog process, and for all potential participants," as "evident by her preparation."[191] The good Socratic instructor also possesses a sense of compassion manifest in recognition that if misused the method can be destructive."[192] Finally, the good Socratic instructor is aware that while lawyers may often be required to speak their views in public, knowing those views will be subject to critique and criticism, new students are likely not practiced in that skill. Students are in law school classes to acquire and practice that very skill through coaching and practice.

That being said, the Socratic method must be taught, not merely deployed.[193] Law professors can successfully teach a rigorous process that allows students to become independent thinkers and self-directed learners by using the question formulation technique (QFT).[194] Developed by Luz Santana and Dan Rothstein, codirectors of The Right Question Institute,[195] the QFT tool

186. Chesters, *supra* note 147, at 148.

187. *Id*.

188. *Id*. at 37.

189. Garrett, *supra* note 143, at 201-02 (Professor Guinier and her coauthors accept the stereotypical harsh and demeaning Socratic method process practiced around them as the norm and call for its elimination from law school pedagogy as a first step to reform).

190. Marshall, *supra* note 150, at 13.

191. *Id*.

192. *Id*. at 14-15.

193. Rothstein & Santana, *supra* note 99, at 2.

194. *Id*. at 3.

195. *Id*. at xi.

was designed to improve education for struggling adult GED and ESOL students through developing their ownership over their own learning.[196]

Providing the question rather than allowing the student to formulate an inquiry does nothing to build the capacity for confidence; by contrast, the QFT provides a method for students to learn to advocate for themselves and creates better independence.[197] The QFT develops divergent, convergent, and metacognitive thinking abilities,[198] the very foundation necessary for the critical-thinking attorney. Divergent thinking generates the wide range of the idea thinking broadly and creatively. Divergent thinking develops hypotheses and possibilities;[199] it is an acquired skill. Divergent thinking provides resources to handle stress.[200] Convergent thinking is the ability to analyze and synthesize information and ideas while moving toward an answer and a conclusion.[201] Convergent thinking generates an idea and provides the ability to explain and summarize.[202] Finally, metacognition, as discussed in Part III, is the ability to think about one's own thinking and learning.[203] Successful students use metacognition to naturally raise questions, make predictions, and reflect on sense and meaning.[204] Most students do not arrive in the elementary classroom equipped in metacognitive skills, however, nor do they leave with them at the end of high school. The problem persists into higher education. [205]

Practically, the QFT is a simple, step-by-step process that facilitates the asking of many questions. The process includes the following steps:

1. A Question Focus (QFocus)
2. The Rules for Producing Questions
3. Producing Questions
4. Categorizing Questions
5. Prioritizing Questions
6. Next Steps
7. Reflection

196. *Id.* at xi, 4. The QFT developed out of issues raised by parents in a low-income community in Massachusetts to navigate the complicated systems of public education when parents would come to school meetings and "did not even know what questions to ask."

197. *Id.* at 6.

198. *Id. at 2.*

199. *Id.* at 15-16.

200. *Id.* at 16.

201. *Id.*

202. *Id.* at 17.

203. *Id.*

204. *Id.*

205. *Id.* at 18.

To begin with the Question Focus (QFocus), show a picture or provide an aural statement and divide students into groups. Set an amount of time to produce questions, and then improve questions. The rules for producing questions are as follows:

Ask as many questions as you can.

Do not stop to discuss, judge, or answer any questions.

Write down every question exactly as it is stated.

Change any statement into a question.[206]

To produce questions, students use the Question Focus (QFocus) to formulate as many questions as possible. The group will raise and ask all kinds of questions about the topic, phrase, image, and situation presented. This part of the process allows students to think freely without having to worry about the quality of the questions they are asking.

Once students have a list of questions, the next step is to improve the questions by categorizing them, for example: distinguishing *closed-ended questions*—those that can be answered with a "yes" or "no," or with one word—from *open-ended questions*—those that require an explanation.

Students will likely have a number of questions on their lists, and next they will prioritize certain ones, such as the three most important questions, three questions that need to be addressed first, or three questions that require further exploration. After choosing the priority questions, the next step is to name a rationale for choosing.

The next step is to determine how the questions can now be put into action—in other words, for what purpose: for research, to develop a project, or for use as a guide.

The last step in the process is reflection. Students now reflect on the work they have done: what they have learned and how they can use it. The reflection helps internalize the process, its value, and how to apply the QFT process further.[207]

Law professors can use the QFT to begin the Socratic dialogue. Traditionally, the law professor would formulate a question that requires a response from the student, calculated to direct the class discussion toward a tested solution to the legal problem and to demonstrate the process of rational elimination of imperfectly defined and unjustified intuitions.[208] But in flipping to use the QFT process, the professor would instead pose a statement, then divide the class into groups and have the students work under the rules of the QFT process delineated above.

206. *Id*. at 20; *Experiencing the Question Formulation Technique*, The Right Question Institute, www.rightquestion.org (last visited January 12, 2019).

207. *Id*.

208. *Id*.

Using QFT as the Socratic method, the students explore their own questions that test the foundation of potential responses. The QFT process as participatory learning coaches students to develop the abilities to think critically and to present ideas effectively.[209] As in the traditional Socratic method, students develop a sense of which arguments are likely to be regarded as convincing, which provocative, and which acceptable,"[210] but all students participate in the process rather than in a one-to-one student-to-professor ratio that the remainder of the class observes.

Lawyers need to be able to formulate questions for a deposition, not merely to present an original theory to the court.[211] The construction and phrasing of a question shapes the kind of information the questioner can expect to receive.[212] This dialogue andragogy in the classroom through QFT and modified Socratic method, therefore, trains students to "present ideas to groups, defend those ideas, and propose solutions to legal problems" in a low-stakes venue, providing the foundation for public speaking to clients and corporate boards, or in courtrooms or administrative proceedings; it is integral to becoming a lawyer.[213]

VI. Conclusion

To achieve progress in learning in legal education, we need to abandon tired neuromyths about learning styles, multiple intelligences, multitasking, left-brain and right-brain theories of personality, and other fallacies that do not advance teaching or learning in law classrooms. These neuromyths stymie law education at a crucial time in the academy.

209. *Id*.

210. *Id*.

211. *See, e.g.*, Elie Mystal, *Why Did Trump's Lawyers Leak the Mueller Questions? A Few Theories*, Above the Law (May 1, 2018), https://abovethelaw.com/2018/05/why-did-trumps-lawyers-leak-the-mueller-questions-a-few-theories/. To highlight the difference between topics and questions, let's take a well-known example: the Lester Holt interview in which Trump admitted that he fired James Comey because of the "Russia thing." In the published document, the question is, "What did you mean in your interview with Lester Holt about Mr. Comey and Russia?" But that's not how this *topic* will come at Trump in a deposition. Instead, it'll be a series of *questions* like: "Who approached you for the Holt interview?" "Did you set it up yourself?""Did you know what he was going to ask in advance?" "Did you do any prep for that interview? Are there documents reflecting that prep? Can we see them?" "Had you spoken with Holt before? His producers?" "How much of the interview made it on air? What did you talk about that was cut?" "When you said 'the Russia thing,' what were you referring to? A specific report? A news item?" "How did Comey's handling of the 'Russia thing' displease you?""Was Holt the only person you told about your thinking? Who else? Was Holt the only reporter you told about your thinking? Who else?" And that's if they even ASK about Holt! Given time constraints, it might not be worth it to get additional answers to something that Trump has already talked about on the record. Again, deposition questions are way more specific than what was published in the Times.

212. Rothstein & Santana, *supra* note 99, at 74, 85.

213. Dickenson, *supra* note 157, at 106.

Instead, law andragogy, which embodies the Socratic method of dialogue, can and should leverage this powerful self-regulating practice to enhance law learning. Law can also adopt the literature on cognitive psychology and institute an evidence-based teaching and learning focus on the following concepts explored in detail above:

1. Connect with prior knowledge
2. Enhance learning transfer
3. Use practice and feedback strategies
4. Teach and value habits of mind
5. Identify metacognitive structures and barriers to learning
6. Engage in healthy retrieval practices for long-term memory
7. Activate a growth mindset
8. Engage in reflection
9. Teach the art of question formulation
10. Practice the dialogue

Professors also might consider the vital role "mindset" plays in terms of effort and learning. Since the publication of Carol Dweck's book *Mindset* in 2006, many scholars in the academy have discussed and promoted adopting a growth mindset in legal education.[214] Dweck writes that "the view you adopt for yourself profoundly affects the way you lead your life."[215] Dweck defines the fixed mindset as the belief that your inherent qualities are carved in stone, that you "have only a certain amount of intelligence, a certain personality, and a certain moral character."[216] By contrast, the growth mindset is based on the belief that you can cultivate your basic qualities through your efforts, and that you can change and grow through application and experience.[217] If we operate with a fixed mindset, Dweck opines, every new situation we encounter challenges our ability to succeed. A fixed mindset therefore can create an inaccurate self-perception and cause us to give up or settle unhappily into a situation or circumstance that is not productive.[218]

214. Seventy-seven law review articles between 2006 and 2017.

215. *See* Carol Dweck, Mindset: The New Psychology of Success (2007) (discussing the importance of the growth mindset).

216. *Id*.

217. *Id*. at 7.

218. *Id*. at 34 (explaining that a person's failure can be an unproductive mindset). Dweck explains that the fixed mindset puts a kibosh on exuberant learning: As soon as children are able to evaluate themselves, some of them become afraid of challenges. Students become afraid of not being smart and reject the opportunity to learn. The high stress and competitive atmosphere of law school produce a petri dish for capable students to collapse under fixed mindsets. As law professors we can check our own mindsets to ensure growth and build an effort-rewarding, learning atmosphere in which students are encouraged to learn and not rely merely on self-assessed and self-assumed innate talents.

When professors activate a growth mindset, we model the changes necessary for student learning. We believe that students can achieve lasting learning with hard work and effort. Our challenge is to revisit the legal landscape we create for our students. Do we believe that only the most brilliant students succeed in law? How do we help students with fixed mindsets who struggle with learning when we may possess fixed mindsets ourselves? What would a growth mindset look like in law? These questions are beyond the scope of this Article, but worth reflecting upon, as mindset affects both the teaching and the practice of law.

Law education possesses the tools necessary to create outstanding classroom experiences. It remains for law to incorporate these borrowed education strategies mindfully into legal education. To do so will enhance and improve the teaching and learning process and build law education into a training ground for the finest critical-thinking practitioners.