

Making Legal Education Stick: Using Cognitive Science to Foster Long-Term Learning in the Legal Writing Classroom

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ABSTRACT

A number of surprising findings from cognitive science suggest that some of the predominant current approaches to teaching legal writing may be a mistake because current practices are not optimal for making the skills acquired in the legal writing classroom “stick” for the long term. In particular, four surprising findings that relate to retention of learning have import for legal writing pedagogy. First, making learning difficult, even asking students to solve problems before teaching students how to do so, is optimal for long-term retention of information and skills. Second, determining and teaching to students’ learning styles may not be important, but the concept of how students build mental models, or structures, is of great import and may have a profound effect on long-term retention of learned material. Third, practice that is focused and repetitive is not ideal, but rather practice that is spaced, varied, and interleaved, meaning interspersed with other skills, is optimal for learning. Finally, students’ reactions to failure can have a profound effect on their skill acquisition. Applying each of these points to the legal writing classroom suggests a number of changes. Recently, some scholars have put forth excellent ideas for changes in the legal writing classroom that fall in line with these findings of cognitive science. In other areas, especially the area of spaced, interleaved, and varied practice, the scholarship is lacking and new ideas are needed. This Article will both draw on recent works of scholarship and propose changes that have not yet been addressed by the academy.

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INTRODUCTION

A number of surprising findings from cognitive science suggest that some of the predominant current approaches to teaching legal writing may be a mistake. In their recent text, *Make It Stick: The Science of Successful Learning*, Professors Henry L. Roediger III and Mark A. McDaniel, cognitive scientists at Washington University in St. Louis, explain that cognitive research demonstrates that much of what is presumed to be true about the best way to teach and learn is “wasted effort.”¹ Using the latest cognitive research about optimal learning for long-term retention and deep understanding, the authors argue that the most effective learning strategies are not intuitive, and that most students and universities do not use optimal methods of learning and teaching.² In fact, the optimal methods of teaching for long-term retention and deep understanding stand in diametric opposition to fundamental assumed educational truths of how students best learn.³

In recent years, the legal academy has begun to examine how various findings of cognitive science may suggest changes to traditional teaching methods used in law school.⁴ Professors Roediger and McDaniel’s comprehensive work offers an opportunity to take a broad view of the current status of cognitive science regarding learning in order to examine how these surprising findings about long-term learning may have a direct impact on law school pedagogy.

Moreover, Professors Roediger and McDaniel’s focus on teaching and learning that leads to long-term retention of information and skills is critical to legal education precisely because students need to recall and apply what they have learned in law school not just at the end of the class or even for the bar exam, but for the benefit of their clients years later. The call for “practice-ready attorneys” that has pervaded discussions about improving legal education for decades is directly tied to long-term learning. In short, the “practice-ready” attorney is one whose legal education has “stuck.” The call for “practice-ready” attorneys has been tied closely to a related call for increased emphasis on skills-based courses.

1. PETER C. BROWN, HENRY L. ROEDIGER III & MARK A. MCDANIEL, *MAKE IT STICK: THE SCIENCE OF SUCCESSFUL LEARNING* ix (2014). Professors Henry Roediger and Mark McDaniel are professors of Psychology at Washington University in St. Louis. Peter C. Brown is a writer and novelist living in St. Paul Minnesota. As they explain in their preface, Professors Roediger and McDaniel “teamed up” with Peter Brown in order to create a work that that explained how learning and memory work “less by reciting the research than by telling the stories of people who have found their way to mastery of complex knowledge and skills.” *Id.* at x.

2. *Id.* at x.

3. *Id.*

4. See, e.g., Terrill Pollman, *The Sincerest Form of Flattery: Examples and Model-Based Learning in the Classroom*, 64 J. Legal Educ. 298, 300 (2014) (“Recent scholars examining law school pedagogy have applied cognitive science”); see also Anthony S. Niedwiecki, *Lawyers and Learning: A Metacognitive Approach to Legal Education*, 13 WIDENER L. REV. 33, 34–35 (2006) (“Although an increasing number of legal education scholars have begun discussing learning theory as it relates to law school education and teaching, they have just touched the surface of the discipline.”).

The first skills-based course most law students encounter is a legal writing and analysis course in their first year of law school. This Article, therefore, will focus on how Professors Roediger and McDaniel's work could lead to changes in the first year legal writing classroom. The Article will leave the impact of these findings on casebook classes for future exploration.

Part I will briefly recount the call over the past two decades for "practice-ready" attorneys and how this mandate relates to long-term learning in legal education and in skills-based classes in particular. Part II will explain Professors Roediger and McDaniel's analysis of the state of cognitive scientific understanding of optimal learning for long-term retention and deep understanding, setting out four surprising findings that have direct importance to legal education. Finally, Part III will explore how these surprising findings suggest changes in the legal writing classroom in order to bring the teaching of legal writing into accordance with scientific understandings of cognition and what is actually effective for long-term retention and application of acquired knowledge. In so doing, Part III will both draw on recent works of scholarship regarding teaching and learning in legal education, pointing out how those previous works fit within Professors Roediger and McDaniel's framework, and will also suggest changes that have not yet been explored by the legal academy.

I. LONG-TERM LEARNING IN LAW SCHOOL MATTERS TO THE PROFESSION: THE "PRACTICE-READY" NEW ATTORNEY

There has been an evolution in legal education to include not just theoretical training but also skills-based curricula. The legal academy long resisted such reforms, viewing practical skills training as the "grubby"⁵ stuff of "trade schools,"⁶ rather than the more rarified theoretical material of graduate education.⁷ "In the 1980s and '90s . . . 'most law schools could promise their applicants excellent job prospects even if they did not have programs in place to impart practical skills'" because of the inadequate supply of new law school

5. Christopher G. Wren & Jill Robinson Wren, *The Teaching of Legal Research*, 80 LAW LIBR. J. 7, 24–25 (1988) (stating that "[p]roponents of a graduate school model advocate a curriculum concentrating almost exclusively on the theoretical and policy underpinnings of legal doctrines and generally disdain courses intended to develop 'grubby' skills considered useful only in practicing law. A trade school model, on the other hand, presumes that a law school exists to train students principally to practice law.").

6. Gary S. Laser, *Educating for Professional Competence in the Twenty-First Century: Educational Reform at Chicago-Kent College of Law*, 68 CHI.-KENT L. REV. 243, 268–69 (1992) (indicating that "[h]istorically, most law school educators rejected the idea that a law school education ought to include broad-based instruction in skills and values and in the art of lawyering. The traditional approach to legal education essentially borrowed a liberal arts methodology and applied it to professional education It also assumed that a law school connected to a university ought to teach research-based theory and theoretical skills and not the practical skills and values associated with trade schools.").

7. See Laser, *supra* note 6, at 268 (noting that "[t]he 'grudging' attitude toward legal skills training has resulted in part from the tension between the 'trade school' and 'graduate academy' views of American schools.").

graduates to meet legal employers' needs.⁸ Thus, jobs were readily available despite educational deficiencies which were then remedied by employers.⁹

An antagonistic view towards the inclusion of practical skills from then to now has come to appear as dated as stove-pipe hats, pocket-watches, and monocles. Of the movement towards practical skills legal education, Dean Luke Bierman offered a brief but telling synopsis: "everybody's doing it."¹⁰ The legal academy has largely accepted that "[w]hat law students want and deserve is a true professional education that includes instruction in the craft of the law, not just legal theory and doctrine."¹¹ The second component of that formulation, law faculties' expanded view of what students deserve, has been greatly aided by the simultaneous lauding and shaming of the legal academy that occurred with the highly influential 2007 report from the Carnegie Foundation on Higher Education, *Educating Lawyers: Preparation for the Profession of Law*.¹² That report praised law schools for quickly and effectively teaching students to think like a lawyer¹³ but strongly criticized law schools for failing to assist students' further in developing practical skills.¹⁴

In response to mounting criticism, law schools have been shifting their focus to producing "practice-ready" attorneys.¹⁵ Practical skills education in preparing

8. Joshua L. Plager, *All Things Equal: Unintended Consequences and Allegedly Misrepresented Statistics*, 67 U. MIAMI L. REV. 681, 690 (2013).

9. *See id.*

10. Don J. DeBenedictis, *Practical Skills in Vogue in Law School Classrooms*, L.A. DAILY J. (Sept. 17, 2013), <http://www.dailyjournal.com/public/Pubmain.cfm?seloption=The%20New%20Lawyer&pubdate=2013-05-21&shNewsType=Supplement&NewsId=965&sdivId=&screenHt=680&eid=931174> [http://perma.cc/6A2H-F3BX].

11. Roy Stuckey, *Foreword*, 38 WM. MITCHELL L. REV. 900, 903 (2012).

12. *See generally* WILLIAM M. SULLIVAN ET AL., *EDUCATING LAWYERS: PREPARATION FOR THE PROFESSION OF LAW* (2007).

13.

From this comparative perspective [comparing with other professional schools], law schools are impressive educational institutions. In a relatively short period of time, they are able to impart a distinctive habit of thinking that forms the basis for their students' development as legal professionals. In our visits to over a dozen schools of different types and geographical locations, our research team found unmistakable evidence of the pedagogical power of the first phase of legal education. Within months of their arrival in law school, students demonstrate new capacities for understanding legal processes, for seeing both sides of legal arguments, for sifting through facts and precedents in search of the more plausible account, for using precise language, and for understanding the applications and conflicts of legal rules. Despite a wide variety of social backgrounds and undergraduate experiences, they were learning, in the parlance of legal education, to "think like a lawyer." This is an accomplishment of the first order that deserves serious consideration from educators of aspirants to other professional fields.

Id., at 186.

14. *Id.*, at 188.

15. William E. Foster & Emily Grant, *Memorializing the Meal: An Analogical Exercise for Transactional Drafting*, 36 U. HAW. L. REV. 403, 403 (2014) ("The legal academy is increasingly focused on producing practice-ready lawyers."); Laurie A. Lewis, *Clerkship-Ready: First-Year Law Faculty Are Uniquely Poised to Mentor Stellar Students for Elbow Employment with Judges*, 12 APPALACHIAN J.L. 1, 2-3 (2012) ("Over the past

students to be practicing attorneys resides at the heart of such an educational mission.¹⁶ In fact, most recently, the American Bar Association (“ABA”) has set forth a standard that requires law schools to make at least six credits of “experiential” learning mandatory in the curriculum.¹⁷ With such a focus, legal education has moved beyond teaching to the end of the semester exam or even the bar exam but instead has shifted to a focus on long-term skill development that will aid a student in practice.¹⁸

II. SURPRISING FINDINGS ON LONG TERM LEARNING FROM COGNITIVE SCIENCE

Given the importance of long-term skill development to heed the call for the “practice-ready” attorney, it is time for the legal academy to pay closer attention to not just including a skills-based curriculum, but including a skills-based curriculum that is designed and taught such that students will *retain* the taught skills as they move forward to represent clients in practice. Using the latest cognitive research about learning for long-term retention and deep understanding is key to creating just such a curriculum. Professors Roediger and McDaniel’s comprehensive work, which sets out several non-intuitive truths about how students learn best, offers an opportunity to review the lay of the land in cognitive science regarding long-term learning. Four of Professors Roediger and McDaniel’s main points are particularly applicable to the legal education setting: (A) making learning difficult for students is often optimal, (B) determining and teaching to students’ learning styles may not be important, (C) practice that is focused and repetitive is not ideal, and (D) students’ reactions to failure can have a profound effect on their skill acquisition. This section will explore each of these findings in turn.

A. MAKING LEARNING DIFFICULT IS OPTIMAL: GENERATIVE LEARNING AND DESIRABLE DIFFICULTIES

An intuitive way to learn a new skill is to be told about or to read about how to do something, and then to put that information to use by applying it to a practice

several years, employers in all sectors have demanded that new attorneys come equipped with a basic proficiency in practical legal skills. In response, law schools have redesigned their curricula to focus on the skills required to produce practice-ready graduates.”).

16. Ann M. Scarlett, *The Benefits of Integrating Entrepreneurship into Business Associations*, 59 ST. LOUIS U. L.J. 711, 722 (2015).

17. ABA STANDARDS AND RULES OF PROC. FOR APPROVAL OF L. SCHS. 303(a)(3), 304(a) (2015).

18. Cf. N.Y.C. BAR ASS’N TASK FORCE ON NEW LAWYERS IN A CHANGING FOR., N.Y.C. BAR ASS’N, REPORT DEVELOPING LEGAL CAREERS AND DELIVERING JUSTICE IN THE 21ST CENTURY 78 (2013) (criticizing current bar examinations for failing to test skills needed for lawyering); Cheryl Rosen Weston, *Legal Education in the United States: Who’s in Charge? Why Does It Matter?*, 24 WIS. INT’L L.J. 397, 419 (2006) (distinguishing between substantive courses that are tested on the bar exam and skills courses that make students practice-ready).

problem or task at hand. This method is followed in schools and universities across the country.¹⁹ The students read their text, the teacher explains in a lecture, or both; then the students apply the information they learned. Cognitive science, however, suggests that another method—termed “generative learning”—may be more effective.²⁰

Generative learning is learning in which the student tries to solve a problem without first being taught how to do so.²¹ The student “generates” the answer to a problem, rather than “recalls” the answer she was previously taught.²² Even when the student generates a wrong answer, as long as corrective feedback²³ is given—the student eventually is led to the correct answer—generative learning results in better long-term learning than does learning based on recall alone.²⁴

The key to why generative learning is a powerful tool to long-term learning lies in how the brain learns.²⁵ The brain converts sensory perceptions (what you are told, what you observe, etc.) into “memory traces,” the beginning of a memory, through a process called “encoding.”²⁶ To turn this short-term memory into long-term learning, another process, called “consolidation” must occur.²⁷ In the process of consolidation, the brain strengthens the memory traces, reorganizing and stabilizing them into something the brain will retain long-term.²⁸ Consolidation “involves deep processing of the new material, during which scientists believe that the brain replays or rehearses the learning, giving it meaning, filling in blank spots, and making connections to past experiences and to other knowledge already stored in long-term memory.”²⁹ Scientists also believe that sleep plays a role in the process of consolidation: during sleep, the brain is able to “flag[] and store[] important memories, both intellectual and physical.”³⁰

19. See BROWN ET AL., *supra* note 1, at 58–59.

20. See *id.* at 4, 94; see also Larry L. Jacoby, *On Interpreting the Effects of Repetition: Solving a Problem Versus Remembering a Solution*, 17 J. VERBAL LEARNING & VERBAL BEHAV. 649, 649–67 (1978); Norman J. Slamecka & Peter Graf., *The Generation Effect: Delineation of a Phenomenon*, 4 J. EXPERIMENTAL PSYCHOL.: HUM. LEARNING & MEMORY 592, 592–604 (1978); Lindsey E. Richland et al., *The Pretesting Effect: Do Unsuccessful Retrieval Attempts Enhance Learning?* 15 J. EXPERIMENTAL PSYCHOL.: APPLIED 243, 243–57 (2009).

21. BROWN ET AL., *supra* note 1, at 94.

22. *Id.*

23. *Id.* at 90–91.

24. *Id.* at 101.

25. *Id.* at 72–76.

26. *Id.*

27. *Id.*; see also James L. McGaugh, *Memory—A Century of Consolidation*, 287 SCIENCE 240, 248–51 (2000).

28. BROWN ET AL., *supra* note 1, at 72.

29. *Id.* at 73.

30. BENEDICT CAREY, *HOW WE LEARN: THE SURPRISING TRUTH ABOUT WHEN, WHERE, AND WHY IT HAPPENS* 198 (2015); see also Erin J. Wamsley, et al., *Dreaming of a Learning Task is Associated with Sleep-Dependent Memory Consolidation*, 20 CURRENT BIOLOGY 850, 850–55 (2010).

The final step in creating true long-term learning is the ability to retrieve the learned information when necessary.³¹ The brain develops what scientists call “retrieval cues.”³² Each time a student practices material and therefore retrieves information, the student creates stronger retrieval cues such that the information or skill will be readily available.

Generative learning is a powerful learning technique because it triggers the deep processing necessary in the consolidation process. Researchers have found that “active learning,” learning that is effortful rather than passive, triggers deep processing of information; generative learning is a prime example of active learning.³³ The effort necessary to create (generate) the answer to a problem when you have not been given the solution is a far cry from passive reception of information.³⁴ The very effort helps create the long-term learning.³⁵

Two researchers, Elizabeth and Robert Bjork of the University of California, Los Angeles, have coined the term “desirable difficulties” for difficulties in the learning process that create better learning outcomes precisely because the active and effortful learning created by the difficulty triggers the deep processing necessary for consolidation of short-term memory into long-term retention of information or skills.³⁶ Generation is an example of a desirable difficulty.³⁷

To be a desirable difficulty, as opposed to an undesirable difficulty, however, the difficulty must be surmountable.³⁸ In other words, the student must be able to work through the difficulty, with or without guidance, to arrive at the correct answer or technique.³⁹ Corrective feedback given after a student has engaged in generative learning can help the student do just this.⁴⁰ The student has engaged in active learning, triggering the deep processing necessary for long-term learning, but has been eventually led to the correct answer.⁴¹ If corrective feedback were not given, however, the difficulty created by not giving the student any guidance would change from a desirable difficulty to an undesirable difficulty, as the

31. BROWN ET AL., *supra* note 1, at 75, 100; *see also* Edul Tulving, *Cue Dependent Forgetting*, 62 AM. SCIENTIST 74, 74–82 (1974).

32. BROWN ET AL., *supra* note 1, at 75; *see also* Tulving, *supra* note 31, at 74–82.

33. BROWN ET AL., *supra* note 1, at 87–88.

34. *See id.*

35. *Id.*

36. CAREY, *supra* note 30, at 35–36, 38; BROWN ET AL., *supra* note 1, at 98. The term was first used by the Bjorks in Robert A. Bjork & Elizabeth L. Bjork, *A New Theory of Disuse and an Old Theory of Stimulus Fluctuation*, in 2 S.M. COGNITIVE PROCESSES: ESSAYS IN HONOR OF WILLIAM K. ESTES 35–67 (Alice F. Healy et al. eds., 1992).

37. BROWN ET AL., *supra* note 1, at 98.

38. *Id.* at 98–99; *see also* Elizabeth L. Bjork & R.A. Bjork, *Making Things Hard on Yourself, But in a Good Way: Creating Desirable Difficulties to Enhance Learning*, in PSYCHOLOGY IN THE REAL WORLD: ESSAYS ILLUSTRATING FUNDAMENTAL CONTRIBUTIONS TO SOCIETY 55–64 (Morton A. Gernsbacher et al. eds., 2009).

39. BROWN ET AL., *supra* note 1, at 98.

40. *Id.* at 90–91, 101.

41. *Id.*

student would simply be left confused without any resolution to the confusion.⁴²

B. LEARNING STYLES MAY NOT MATTER: STRUCTURE BUILDING IS KEY

One pervasive concept that has taken hold in educational communities is the concept of “learning styles,” meaning the notion that different people are better at processing information in different forms—visually, aurally, or kinesthetically for example—and therefore learning will be optimal if information is delivered in the form in which a person best processes information.⁴³ As Professors Roediger and McDaniel explain,

[b]elief in the learning style credo is pervasive. Assessing students’ learning styles has been recommended at all levels of education, and teachers are urged to offer classroom material in many different ways so that each student can take it in the way he or she is best equipped to learn it.⁴⁴

However, many of the various learning styles theories are contradictory, and, moreover, none have been scientifically proven to increase learning.⁴⁵ In fact, a 2008 study found no evidence to validate the theory that learning is increased based on delivery of information in the learner’s identified learning style.⁴⁶ Although further testing of these theories may be warranted, the effect of using learning style theory is unproven at best.⁴⁷

Although learning style theory is unproven, there are some scientifically proven cognitive differences in how individuals learn, and being aware of these differences may have a positive impact on structuring curriculum and teaching methods for optimal learning.⁴⁸ One such difference is whether an individual is a “high structure-builder.”⁴⁹ In psychological parlance, structure building is “the act, as we encounter new material, of extracting the salient ideas and constructing coherent mental frameworks” sometimes called “mental models” or “mental maps.”⁵⁰ High structure builders are better at learning new material, whereas low structure-builders are not as effective at learning new material, because they “have difficulty setting aside irrelevant or competing information, and as a result they tend to hang on to too many concepts to be condensed into a workable model

42. *Id.* at 98–99.

43. *Id.* at 131–32.

44. *Id.* at 143.

45. *Id.* at 144–45; see also Harold Paschler et. al., *Learning Styles: A Critical Review of Concepts and Evidence*, 9 PSYCHOL. SCI. PUB. INT. 105 (2009).

46. BROWN ET AL., *supra* note 1, at 145; see also Paschler, *supra* note 45, at 105.

47. Paschler, *supra* note 45, at 105.

48. BROWN ET AL., *supra* note 1, at 153.

49. *Id.*; see also Morton A. Gernsbacher et al., *Investigating Differences in General Comprehension Skills*, 16 J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY, & COGNITION 430 (1990).

50. BROWN ET AL., *supra* note 1, at 153.

(or overall structure) that can serve as the foundation for further learning.”⁵¹ Although the science on high and low structure builders is still in relatively early stages, one study did show that the prompt of embedded questions in a text that helped to focus readers on the main ideas of the text helped low-structure builders better learn the material in the text.⁵² Professors Roediger and McDaniel hypothesize that prompting low-structure builders to engage in reflection after performing a task—reflecting on what went right and wrong and what may be done differently next time—may help low-structure builders isolate key ideas and organize them into mental models such that they can apply those mental models to the next problem.⁵³

Another identified cognitive difference that cognitive science suggests has an impact on learning is the concept of a “rule learner” versus an “example learner.”⁵⁴ Closely related to the concept of high and low structure building, rule learners abstract the “rules” or underlying principles when studying an example, whereas example learners are more apt to memorize the example itself.⁵⁵ When rule learners encounter a novel problem, they can apply the underlying principles extracted to solve it, whereas example learners mimic the memorized example, even if not relevant to the problem at hand.⁵⁶ One technique that helps example learners is when they are asked to compare two different examples at once, rather than focusing on one example at a time.⁵⁷

Another technique that helps example learners extract relevant principles is to ask them to compare disparate problems to find underlying similarities.⁵⁸ Well-known studies in rule learning performed by cognitive scientists Mary L. Gick and Keith J. Holyoak have used the examples of a moated castle and a tumor.⁵⁹ In the moated castle problem, a general’s forces are planning to attack a moated castle.⁶⁰ The general knows that bridges over the moat have been mined such that small groups can cross the bridges (so the occupants of the castle can

51. *Id.*

52. *Id.* at 155; see also Aimee A. Callender & Mark A. McDaniel, *The Benefits of Embedded Question Adjuncts For Low and High Structure Builders*, 99 J. OF EDUC. PSYCHOL. 339, 339–48 (2007).

53. BROWN ET AL., *supra* note 1, at 155.

54. *Id.*; see also Mark A. McDaniel et. al., *Individual Differences in Learning and Transfer: Stable Tendencies for Learning Exemplars Versus Abstracting Rules*, 143 J. EXPERIMENTAL PSYCHOL.: GEN. 668 (2014).

55. BROWN ET AL., *supra* note 1, at 155–56.

56. *Id.*

57. *Id.* at 156; see generally Thorstein Pachur & Henrick Olsson, *Type of Learning Task Impacts Performance and Strategy Selection in Decision Making*, 65 COGNITIVE PSYCHOL. 207 (2012); Mary L. Gick & Keith J. Holyoak, *Schema Introduction and Analogical Transfer*, 15 COGNITIVE PSYCHOL. 1 (1983).

58. BROWN ET AL., *supra* note 1, at 156; see generally Pachur & Olsson, *supra* note 57; Gick & Holyoak, *supra* note 57, at 1.

59. BROWN ET AL., *supra* note 1, at 156–57; Laurel Currie Oates, *I Know That I Taught Them How to Do That*, 7 THE J. OF THE LEGAL WRITING INST. 1 (2001); see also Mary L. Gick & Keith J. Holyoak, *Analytical Problem Solving*, 12 COGNITIVE PSYCHOL. 306, 349 (1980); see generally Gick & Holyoak, *supra* note 57.

60. BROWN ET AL., *supra* note 1, at 156–57; Oates, *supra* note 59, at 1.

bring in food and fuel) but a large force will trip the mines.⁶¹ The student is asked how the general can get a large force into the castle for the attack without tripping the mines. In the tumor problem, a doctor faces a patient with an inoperable tumor.⁶² The tumor can be destroyed through focused radiation, but a beam strong enough to destroy the tumor will also damage the healthy tissue through which it passes.⁶³ The student is asked how the tumor can be destroyed without damaging healthy tissue.⁶⁴ Students who are instructed to look for similarities in these two problems fare better than students who focus on just one problem.⁶⁵ By comparing similarities (both problems require a large force to be directed at a target, the large force cannot be delivered through a single route without adverse consequences, smaller forces can be delivered to the target but are not large enough to solve the problem), students more readily arrive at the solution of dividing the force into smaller forces and attacking through different routes at the same time to converge on the target.⁶⁶ Moreover, beyond just aiding in solving the problems at hand, this type of comparison exercise helps students derive the “rules” or underlying principles that allow students to solve a variety of similar problems.⁶⁷

In short, although research into high and low structure learners and rule and example learners is nascent, the research suggests that learning techniques focused on helping students build mental models may be more impactful than learning techniques focused on students’ learning styles or preferences, and that the concepts of high and low structure learners and rule and example learners may have a place in this discussion.

C. “PRACTICE, PRACTICE, PRACTICE” DOES NOT WORK: SPACED, VARIED, AND INTERLEAVED PRACTICE

A common and intuitive conception about learning is that focused, repetitive practice is the best route to mastery.⁶⁸ This idea may call up the image of your childhood piano teacher, saying “practice, practice, practice” as you repeat the same music piece over and over again. Researchers call this type of practice “massed practice.”⁶⁹ Massed practice is an intuitive method of learning at least in

61. BROWN ET AL., *supra* note 1, at 156–57; Oates, *supra* note 59, at 1.

62. Oates, *supra* note 59, at 1.

63. *Id.*

64. *Id.*

65. *Id.*

66. *Id.*

67. *Id.*

68. BROWN ET AL., *supra* note 1, at 47.

69. *Id.*

part because it yields readily observable results.⁷⁰ In general, as one engages in massed practice, one can observe herself improving.⁷¹ The piano piece sounds better after a session of “practice, practice, practice.”

Professors Roediger and McDaniel term this “the myth of massed practice.”⁷² Because massed practice appears to be working, learners and teachers use it.⁷³ However, as Professors Roediger and McDaniel explain, “[t]he rapid gains produced by massed practice are often evident, but the rapid forgetting that follows is not.”⁷⁴ Cognitive science on long-term learning suggests that although massed practice results in short-term gains in skill, for long-term retention of a skill, it is not the best technique.⁷⁵

Practice itself is certainly a key to learning, but cognitive science strongly suggests that for long-term skill retention, instead of massed, practice should be spaced, interleaved, and varied.⁷⁶ Spaced practice, as it sounds, is practice that is spaced out with some significant time interval between practice sessions.⁷⁷ The key to why spaced practice works is rooted in the way brains assimilate new learning into long term memory.⁷⁸ As discussed above, embedding newly learned skills into long term memory requires a process researcher’s call consolidation in which the new learning is connected to prior knowledge.⁷⁹ Massed practice relies on short term memory for skill gains, but to consolidate that learning into long-term memory requires the time for a person’s brain to connect the new learning to what came before.⁸⁰ The forgetting that happens between spaced practice sessions is actually helpful to this consolidation process.⁸¹ The effort of recalling skills after a period of forgetting helps strengthen the skills and connect them to the prior knowledge.⁸² In essence, when one engages in spaced practice she forces her brain to retrieve forgotten information, strengthening the recall cues for the next time the information needs to be recalled.⁸³

70. *Id.*; see generally Nate Kornell & Robert A. Bjork, *Learning Concepts and Categories: Is Spacing the “Enemy of Induction”?*, 19 *PSYCHOL. SCI.* 585 (2008) (although objective learning outcomes of study were better when interleaved practice was used, learners insisted that they learned better with massed practice).

71. BROWN ET AL., *supra* note 1, at 47.

72. *Id.*

73. *Id.*

74. *Id.*

75. *Id.*; CAREY, *supra* note 30, at 74.

76. BROWN ET AL., *supra* note 1, at 48–51.

77. *Id.* at 48; CAREY, *supra* note 30, at 65.

78. BROWN ET AL., *supra* note 1, at 49.

79. *Id.*

80. *Id.*

81. *Id.*

82. *Id.* at 48–49; see also Jeffrey Karpicke, *Retrieval Based Learning: Active Retrieval Promotes Meaningful Learning*, 31 *CURRENT DIRECTIONS PSYCHOL. SCI.* 157, 159 (2012).

83. BROWN ET AL., *supra* note 1, at 49; CAREY, *supra* note 30, at 22, 74; see also Carol-Anne E. Moulton et al., *Teaching Surgical Skills: What Kind of Practice Makes Perfect?*, 244 *ANNALS OF SURGERY* 400, 400–09 (2006) (study of surgical residents showing better retention and application of surgical techniques from spaced

The idea that practice over time is helpful may not be surprising,⁸⁴ but more surprising is that practice that is both interleaved and varied, rather than focused and repetitive, is the most effective for long-term learning.⁸⁵ Interleaved practice occurs when various skills or subjects are practiced in a mixed fashion rather than one at a time.⁸⁶ The quintessential example of non-interleaved practice is a math textbook in which one type of problem is discussed in one chapter, students learn about and work those problems, and then another type of problem is discussed in the next chapter.⁸⁷ Interleaved practice, on the other hand, would be working all different kinds of problems in a mixed fashion.⁸⁸

A related concept, varied practice, occurs when even within practice on the same skill, there is variation between the types of problems faced by the learner.⁸⁹ So rather than the same exact skill practiced again and again, a slightly (or not so slightly) different problem faces the learner at each challenge.⁹⁰ In one study on the effect of varied practice, a group of eight-year olds practiced tossing beanbags into buckets.⁹¹ Half of the children tossed the beanbags into buckets set three feet away.⁹² The other half varied their practice by tossing bean bags into buckets two feet and four feet away (but not three feet).⁹³ Twelve weeks later, the children were tested on their accuracy in tossing bean bags into buckets set three feet away.⁹⁴ The children who engaged in varied practice did significantly better than the children who engaged in repetitive practice, even though the varied practice never actually included the exact skill tested.⁹⁵

Something referred to as “blocked practice,” in which a series of different practice steps are performed over and over again is easily mistaken for varied and interleaved practice.⁹⁶ A prime example is running a hockey drill in which a number of skills are used (passing, shooting), but running it from the same place

instruction consisting of four shorter periods of instruction over several weeks rather than massed practice consisting of intensive daylong practice session).

84. CAREY, *supra* note 30, at 65.

85. BROWN ET AL., *supra* note 1, at 49–51.

86. *Id.* at 49.

87. *Id.* at 49–51; *see generally* Dough Rohrer & Kelli Taylor, *The Shuffling of Mathematics Problems Improves Learning*, 35 INSTRUCTIONAL SCI. 481–98 (2007) (laboratory experiment demonstrating that interleaved practice of mathematics problems produced better performance on final exam than non-interleaved practice).

88. BROWN ET AL., *supra* note 1, at 49–51.

89. *Id.* at 51.

90. *Id.*

91. *Id.* at 46, 51; Robert Kerr & Benard Booth, *Specific and Varied Practice of Motor Skill*, 46 PERCEPTUAL & MOTOR SKILLS 395, 395–401 (1978) (reporting the results of the bean bag study).

92. BROWN ET AL., *supra* note 1, at 46, 51; Kerr & Booth, *supra* note 91, at 395–401.

93. *Id.*

94. *Id.*

95. *Id.*

96. BROWN ET AL., *supra* note 1, at 65.

on the ice in the same sequence.⁹⁷ The key to deep learning and long term retention, however, is in the diversity and un-patterned nature of the practice.⁹⁸

In another experiment in varied and interleaved practice, a college baseball team was broken into two groups.⁹⁹ One group followed a batting practice regiment that was a form of massed practice. They each practiced hitting forty-five pitches broken into three sets consisting of one type of pitch thrown fifteen times.¹⁰⁰ For instance, a batter would face fifteen fast balls, then fifteen curve-balls, and then fifteen change-ups.¹⁰¹ The other group followed a varied and interleaved practice regiment in which they also hit forty-five pitches, but the three types of pitches were randomly dispersed over the set of forty-five so the batter did not know which type of pitch was coming at him.¹⁰² The second group did not show the immediate progress their teammates who were following a massed practice regiment showed.¹⁰³ The players in the second group had more trouble connecting with the ball, and the learning process felt more arduous and slower to them.¹⁰⁴ After six weeks, however, the players who followed the varied and interleaved practice regiment displayed markedly better hitting skills than the players in the massed practice group.¹⁰⁵

As the baseball study suggests, one benefit from varied and interleaved practice appears to be in the development of discrimination skills.¹⁰⁶ People engaged in varied and interleaved practice learn how to determine what type of problem they are facing and to select and apply the best solution given a wide range of practiced possibilities.¹⁰⁷ Because not all problems faced in the future will fall into a simple pattern, discrimination is one key to learning for long-term retention and use of skills.¹⁰⁸

The benefits of varied and interleaved practice are not limited to motor skills, but apply to cognitive skills as well, including higher spheres of cognitive skills such as conceptual knowledge.¹⁰⁹ A number of experiments have shown benefits of varied practice on cognitive skills such as solving anagrams (rearranging letters to form words), attributing paintings to artists who created them, and

97. *Id.* at 52.

98. *See id.* at 65–66.

99. *Id.* at 79–81; *see also* Kellie G. Hall et al., *Contextual Interference Effects with Skilled Baseball Players*, 78 PERCEPTUAL & MOTOR SKILLS 835, 835–41 (1994).

100. BROWN ET AL., *supra* note 1, at 79–81; Hall et al., *supra* note 99, at 835–41.

101. Hall et al., *supra* note 99, at 835-41.

102. *Id.*

103. *Id.*

104. BROWN ET AL., *supra* note 1, at 79–81; Hall et al., *supra* note 99, at 835–41.

105. Hall et al., *supra* note 99, at 835-41.

106. BROWN ET AL., *supra* note 1, at 53.

107. *Id.*

108. *Id.*; *see also* Larry L. Jacoby et al., *Test-Enhanced Learning of Natural Concepts: Effects on Recognition Memory, Classification, and Metacognition*, 36 J. EXPERIMENTAL PSYCHOL.: LEARNING, MEMORY AND COGNITION 1441 (2010).

109. BROWN ET AL., *supra* note 1, at 52.

classifying birds.¹¹⁰ The bird classification study is particularly informative because bird classification requires conceptual knowledge, a higher sphere of comprehension than simple factual knowledge.¹¹¹ To classify birds, one must consider a wide range of characteristic traits that are present in some, but not all members of a bird family.¹¹² “Because rules for classification can only rely on these characteristic traits rather than on defining traits (ones that hold for every member), bird classification is a matter of learning concepts and making judgments, not simply memorizing features.”¹¹³ Thus, even for gaining conceptual knowledge, varied and interleaved practice is superior to massed practice.¹¹⁴

The artist identification study is also informative, both with regard to development of conceptual knowledge, and with regard to the intuitive assumption that interleaved practice will be too confusing to result in learning. In the study, students aimed to identify a painter’s works.¹¹⁵ One group followed a massed practice regiment in which they studied many examples of one painter’s works before moving on to study many examples of the next painter’s works and so on.¹¹⁶ Another group studied the paintings in an interleaved manner, studying different paintings from different artists together.¹¹⁷ The researchers hypothesized that the massed practice would work better because it would enable the students to learn the defining characteristics of each artist’s style, something that would be too hard and confusing to grasp in interleaved practice given all the relevant dimensions that make up an artist’s style.¹¹⁸ The researchers’ prediction, however, turned out to be incorrect.¹¹⁹ The students in the group that practiced in a interleaved fashion did better in testing, both on examples they had studied, and on new examples of the painters’ work to which they had not yet been exposed.¹²⁰ The researchers concluded that “[t]he *commonalities* among one painter’s works that the students learned through massed practice proved less useful than the *differences* between the works of multiple painters that the students learned through interleaving.”¹²¹ In other words, interleaving produced better discrimina-

110. *Id.* at 52–54; Michael K. Goode et al., *Superiority of Variable to Repeated Practice in Transfer on Anagram Solution*, 15 *PSYCHONOMIC BULL. REV.* 662, 662–66 (2008); Kornell & Bjork, *supra* note 70, at 585–92 (artist painting style study); Jacoby et al., *supra* note 108, at 1441–1442 (bird classification study).

111. BROWN ET AL., *supra* note 1, at 54–55; *see also* Jacoby et al., *supra* note 108, at 1441–42.

112. BROWN ET AL., *supra* note 1, at 55.

113. *Id.*

114. *Id.* Spaced, varied, and interleaved practice has also been shown effective for medical students making clinical decisions in diagnosis. *See also* Douglas P. Larsen et al., *Repeated Testing Improves Long-Term Retention Relative to Repeated Study: A Randomised Controlled Trial*, 43 *MED. EDUC.* 1174–81 (2009).

115. BROWN ET AL., *supra* note 1, at 53–54; *see also* Kornell & Bjork, *supra* note 70, at 585–92 (artist identification study).

116. BROWN ET AL., *supra* note 1, at 53–54; *see also* Kornell & Bjork, *supra* note 70, at 585–92.

117. BROWN ET AL., *supra* note 1, at 53–54; *see also* Kornell & Bjork, *supra* note 70, at 585–92.

118. BROWN ET AL., *supra* note 1, at 54.

119. *Id.*

120. *Id.*

121. *Id.*

tion skills.¹²²

In short, the most effective practice is the opposite of focused, repetitive massed practice. Like generation, spaced, varied, and interleaved practice introduces “desirable difficulties” into the learning process.¹²³ Precisely because spaced, varied and interleaved practice requires more effort, the brain consolidates the information better for long-term retention.¹²⁴ However, because spaced varied and interleaved practice results in fewer quickly observable gains than massed practice does, learners do not perceive the benefits of varied, interleaved, and spaced practice.¹²⁵ In fact, in studies such as the artist identification study discussed above, in which participants have shown superior results from this type of practice, the participants still *believe* they learned better when using massed practice.¹²⁶ This is perhaps why the “myth of massed practice” persists.

D. MINDSET AND CHARACTER MATTERS MORE TO LEARNING THAN YOU THINK: TEACHING STUDENTS HOW TO FAIL SUCCESSFULLY

Being able to learn from both successes and mistakes is a key to long-term learning.¹²⁷ Educational psychologists call this ability becoming a self-regulated learner,¹²⁸ meaning someone who has “learned how to learn” from their own experiences.¹²⁹ The process of self-regulated learning is three-fold.¹³⁰

First students must engage in “forethought,” including understanding the assignment, setting goals with regard to the task at hand, and creating an action plan for achieving those goals.¹³¹ At this stage students set either performance goals, meaning their goal is to outperform peers and appear intelligent, or mastery goals, meaning a goal of mastering the skill at hand, regardless of peer performance.¹³²

122. *Id.*

123. *Id.* at 82.

124. *Id.* at 63–64, 82.

125. *Id.* at 50, 54; see Kornell & Bjork, *supra* note 70, at 585–92.

126. BROWN ET AL., *supra* note 1, at 50, 54; Kornell & Bjork, *supra* note 70, at 585–92.

127. BROWN ET AL., *supra* note 1, at 179–80.

128. This is also sometimes referred to as “expert learning.” Niedwiecki, *supra* note 4, at 35; Charles B. Sheppard, *The Grading Process: Taking a Multidimensional, “Non-Curved” Approach to the Measurement of a First-Year Law Student’s Level of Proficiency*, 30 W. ST. U. L. REV. 177, 192 (2003) (“Expert learning is also referred to as self-regulated learning. An expert learner or self-regulated learner approaches the learning process as something to be done for oneself rather than something that is done to the learner. Experts in learning have determined that self-regulated learners are adept at goal setting, self-assessment, and strategic thinking.”).

129. Niedwiecki, *supra* note 4, at 35.

130. *Id.*

131. Michael Hunter Schwartz, *Teaching Law Students to Be Self-Regulated Learners*, 2003 MICH. ST. L. REV. 447 (2003).

132. *Id.*; Carrie Sperling & Susan Shapcott, *Fixing Students’ Fixed Mindsets: Paving the Way for Meaningful Assessment*, 18 LEGAL WRITING: J. LEGAL WRITING INST. 39, 50–51 (2012) (describing the difference between performance and mastery goals). Mastery goals are sometimes also referred to as “learning goals.” See BROWN ET AL., *supra* note 1, at 180 (describing the difference between performance goals and learning goals).

The second stage involves actual performance of the task, called the “implementation phase.”¹³³ This phase involves the student’s ability to focus her attention on the task at hand, and to choose, implement, and monitor the effectiveness of appropriate learning strategies to achieve the task.¹³⁴

The third and final stage, which is critical to the learning process, is referred to as “reflection.”¹³⁵ Here the student reflects both on the effectiveness of her performance and on the implications of this learning experience for future tasks.¹³⁶ Professors Roediger and McDaniel describe reflection in simple, practical terms as,

[T]he act of taking a few minutes to review what has been learned in a recent class or experience and asking yourself questions. What went well? What could have gone better? What other knowledge or experience does this remind you of? What might you need to learn for better mastery, or what strategies might you use next time to get better results?¹³⁷

The reflection phase also involves what educational psychologists call “attribution,” meaning a student determines the reasons why her performance did or did not meet a set standard.¹³⁸ Some students tend to attribute failure to meet a standard to correctable causes such as insufficient effort or incorrect selection of learning techniques, while others attribute failure to meet a standard to innate ability or other causes outside their control.¹³⁹ This reflection phase is what enables a student to adapt and improve the “forethought” phase the next time a related task is undertaken, thus completing a cycle of self-regulated learning and starting another cycle anew.¹⁴⁰ Educational theorist John Dewey has succinctly summed up the importance of the reflection phrase and its relation to the learning cycle stating, “We do not learn from experience . . . we learn from reflecting on

133. Schwartz, *supra* note 131, at 458; Cara Cunningham Warren, *Achieving the American Bar Association’s Pedagogy Mandate: Empowerment in the Midst of A “Perfect Storm,”* 14 CONN. PUB. INT. L.J. 67, 90 (2014).

134. Schwartz, *supra* note 131, at 458, 460; Elizabeth M. Bloom, *Teaching Law Students to Teach Themselves: Using Lessons from Educational Psychology to Shape Self-Regulated Learners*, 59 WAYNE L. REV. 311, 320 (2013).

135. Schwartz, *supra* note 131, at 460; Bloom, *supra* note 134, at 321.

136. Schwartz, *supra* note 131, at 460–61; Bloom, *supra* note 134, at 321.

137. BROWN ET AL., *supra* note 1, at 209–10.

138. Bloom, *supra* note 134, at 321.

139. Schwartz, *supra* note 131, at 461.

140. Bloom, *supra* note 134, at 322. Self-regulated learning is related to the concept of “metacognition,” meaning “the self-monitoring by an individual of his own unique cognitive processes.” Niedwiecki, *supra* note 4, at 34–35. “Generally, metacognition refers to having both awareness and control over one’s learning and thinking.” Niedwiecki, *supra* note 4, at 35. A simpler definition of metacognition is “an umbrella term that means, broadly, thinking about thinking.” PAUL TOUGH, HOW CHILDREN SUCCEED: GRIT, CURIOSITY, AND THE HIDDEN POWER OF CHARACTER 91 (2012); *see also* Timothy Casey, *Reflective Practice in Legal Education: The Stages of Reflection*, 20 CLINICAL L. REV. 317, 346 (2014) (noting that “[m]etacognition generally refers to thinking about thinking”).

experience.”¹⁴¹

It is perhaps unsurprising to most people that this process of self-regulated learning, including the critical component of reflection, is a key to long-term learning. What may be more surprising, however, is which factors enable students to be successful in becoming self-regulated learners, and likewise which factors hinder students from using the self-regulated learning cycle to their benefit. Two such factors are explored here: (1) students’ beliefs on the static or dynamic nature of intelligence, what one researcher calls a fixed or growth mindset, and (2) the related area of “character,” meaning students display of traits such as optimism, self-control, grit, curiosity, and persistence.

1. MINDSET

Mindset Theory, pioneered by psychologist Carol Dweck, holds that one single factor—a student’s belief that intelligence is either fixed or malleable—profoundly affects the student’s ability to learn from failure, and therefore, in effect, to successfully employ the self-regulated learning cycle.¹⁴² Students with what Dweck calls a “fixed mindset” believe that they have a certain amount of natural intelligence or ability that does not change much if at all overtime, regardless of any effort on their part.¹⁴³ However, students with what Dweck terms a “growth mindset”¹⁴⁴ believe that intelligence is malleable rather than static, and therefore that their efforts can have an effect on their intelligence.¹⁴⁵

The learning behavior of students with fixed and growth mindsets varies significantly.¹⁴⁶ Fixed mindset students tend to have performance goals, meaning their aim is to outperform others or to get a certain grade or win a certain accolade.¹⁴⁷ They also tend to avoid taking on tasks that are too challenging, that is, those tasks that could lead to failure, because while success is proof of their innate intelligence, failure would be proof of the lack thereof.¹⁴⁸ When they do fail, they attribute the failure to their own intellect, and display behavior of “helplessness” in which they assume that nothing they do can change such failures in the future.¹⁴⁹ Thus, students with fixed mindsets are not able to successfully employ the three-part cycle of self-regulated learning, including the

141. THE NEW 1L: FIRST YEAR LAWYERING WITH CLIENTS xii (Eduardo R.C. Capulong et al. eds., 2015) [hereinafter THE NEW 1L].

142. CAROL S. DWECK, MINDSET: THE NEW PSYCHOLOGY OF SUCCESS 6–7, 32 (2006); BROWN ET AL., *supra* note 1, at 179–82 [hereinafter DWECK, MINDSET].

143. DWECK, MINDSET, *supra* note 142, at 6, 32.

144. Incremental mindset is another term sometimes used interchangeable with growth mindset. See Sperling & Shapcott, *supra* note 132, at 41, 50.

145. DWECK, MINDSET, *supra* note 142, at 7, 32.

146. *Id.*; BROWN ET AL., *supra* note 1, at 179–80.

147. DWECK, MINDSET, *supra* note 142, at 6; BROWN ET AL., *supra* note 1, at 180.

148. DWECK, MINDSET, *supra* note 142, at 6; BROWN ET AL., *supra* note 1, at 180.

149. DWECK, MINDSET, *supra* note 142, at 6; BROWN ET AL., *supra* note 1, at 180.

key reflection phase, and therefore cannot learn from failure in order to improve in the future, a key to long-term learning.

On the contrary, students with growth mindsets tend to have mastery goals (also termed learning goals), meaning their aim is to learn a new task and meet an internal standard of performance rather than an external standard.¹⁵⁰ Growth mindset students also welcome challenges and see failure not as proof of their lack of intellect, but as an opportunity to improve.¹⁵¹ Growth mindset students are primed to become self-regulated learners in large part because they are able to engage in the key reflection phase of the cycle in which they attribute their failures to correctable causes and take those causes into account in the next cycle of learning. In short, Mindset Theory scientifically supports the truth of the old folk wisdom that “if you think you can, or you think you can’t, you’re right,” a saying that cuts against popular notions that success is tied to one being a “natural” or talent being “in one’s DNA.”¹⁵²

The effect that a fixed mindset and the resulting “helplessness” reaction can have on learning outcomes is staggering. Take, for example, one study in which researchers deliberately added a small, insignificant hurdle into testing that created a small amount of student confusion and recorded the effects on students with fixed mindsets and those with growth mindsets:

The study presented children with five sections of reading and a short comprehension test. Three of the sections were the same for all children. Only two sections differed. Half the students with a fixed mindset received books with confusing sentences embedded in the two sections, and the other half

150. DWECK, MINDSET, *supra* note 142, at 7; BROWN ET AL., *supra* note 1, at 180.

151. DWECK, MINDSET, *supra* note 142, at 6; BROWN ET AL., *supra* note 1, at 180. Professors Sperling and Shapcott describe the difference between performance-goal and mastery-goal-oriented students:

Because it is important for performance-goal-orientated students to appear intelligent, they will use strategies to promote and preserve that appearance. These strategies may include avoiding difficult tasks, cheating on assignments, and making external excuses for poor performances. Performance goal-orientated students typically do not take remedial actions to improve unsatisfactory performances because their only goal is to outperform others on the task at hand. If they fail at that goal, remedial actions, including increased effort, will not help because they believe intelligence cannot be increased and the performance is over.

By contrast, mastery-goal-orientated students are more concerned about learning than outperforming their peers or impressing their instructors. Consequently, challenging assignments do not intimidate them. They see challenges as opportunities to learn new things. Poor performances only represent one snapshot in time; the performance does not define them. Poor performances are opportunities to learn new strategies or a wake-up call that they need to increase their effort.

Sperling & Shapcott, *supra* note 132, at 50–51.

152. The question of whether intelligence is in fact malleable is hotly debated. TOUGH, *supra* note 140, at 97. The related question of the proper definition of “intelligence” is also a debated topic. *See* BROWN ET AL., *supra* note 1, at 147 (discussing psychologist Howard Gardner’s theories of multiple intelligences). However, the answers to these questions are not central to Dweck’s Mindset Theory. TOUGH, *supra* note 140, at 97. The key to Mindset Theory is a student’s *belief* that intelligence is malleable, whether or not that is true given a set definition of intelligence. *Id.*

received a regular book, one without the confusing sentences. The same was true for incrementally [growth] orientated students. Regardless of mindset, students given the regular books scored indistinguishably on the test. But the students who received books with confusing sections earned significantly different test scores. Students with an incremental mindset had a mean score of seventy-one percent on the comprehension test, while students with a fixed mindset had a mean score of thirty-four percent. This experiment captures the helpless behavior students with a fixed mindset exhibit when confronted with difficulty—and in the experiment the difficulty was merely some initial confusion. They essentially gave up when the task became difficult. The students with an incremental [growth] mindset, though, remained relatively unfazed.¹⁵³

Professors Roediger and McDaniel explain that the “fear of failure” that comes with a fixed mindset “diminish[es] performance under pressure, as in a test setting.”¹⁵⁴ This is because the fixed mindset students’ working memory¹⁵⁵ capacity during testing “is expended to monitor their performance (How am I doing? Am I making mistakes?), leaving less working memory capacity available to solve the problems posed by the test.”¹⁵⁶ This test taking anxiety is, in the Bjorks’ terminology, an undesirable difficulty, a difficulty that hinders, rather than helps the learning process.¹⁵⁷

Moreover, the “fear of failure” that comes with a fixed mindset can also create “aversions to the kinds of experimentation and risk taking that characterizes striving.”¹⁵⁸ Students with fixed mindsets and therefore performance goals “unconsciously limit their potential” because they continuously pick challenges they are confident they can meet.¹⁵⁹ They want to “look smart” so they “do the same stunt over and over again.”¹⁶⁰ But, those who have growth mindsets and therefore mastery or learning goals, pick “ever-increasing challenges” and “interpret setbacks as useful information that helps [one] to sharpen [one’s] focus, get more creative, and work harder.”¹⁶¹ Therefore, the key difference of having a fixed mindset versus a growth mindset profoundly affects learning because “[l]earning goals trigger entirely different chains of thought and action

153. Sperling, *supra* note 132, at 50.

154. BROWN ET AL., *supra* note 1, at 91.

155. Working memory is “the amount of information you can hold in mind while working through a problem, especially in the face of distraction.” *Id.*

156. *Id.*

157. *Id.* at 98.

158. *Id.* at 91.

159. *Id.* at 180.

160. *Id.*

161. *Id.*

from performance goals.”¹⁶²

The key question then becomes whether one can change his or her mindset. Perhaps even more surprising than the vast effects of mindset on learning is that the answer to this question is yes, mindset is malleable.¹⁶³ Dweck’s studies have shown that one can change from a fixed mindset to a growth mindset, and that awareness of one’s own mindset as well as the concept of malleable intelligence is a key to creating that shift.¹⁶⁴ In one of Dweck’s experiments, she ran a workshop for low-performing seventh graders teaching the students about the brain and about effective study techniques.¹⁶⁵ Half the students also received a presentation on how the brain changes as a result of effortful learning and were told that intellectual development is the result of this effortful changing of the brain rather than something pre-decided by nature.¹⁶⁶ The other half of the students received a presentation on memory, but were not told about effortful learning and its effect on the brain and on intelligence.¹⁶⁷ The students’ teachers were unaware of which students received which presentation.¹⁶⁸ As the school year progressed, the students who were told that effort could increase their intelligence displayed a “growth mindset” and were more willing to strive to learn.¹⁶⁹ Importantly, the students in this group also became higher achievers than those in the group who were not told about effortful learning and its effect on intelligence.¹⁷⁰

Additionally, Dweck’s research has shown that the manner in which praise is given also has effects on mindset and specifically on mastery or performance goal setting.¹⁷¹ Praise that focuses on a student’s effort leads a student to set mastery goals and take on increasingly challenging work, whereas praise that focuses on a characteristic that appears more static, such as a student being “smart,” encourages students to set performance goals. Performance goals lead students to shy away from challenging work, that is, work that may lead to failure, but also the very work that can lead to greater learning.¹⁷² For example, in one study, fifth grade students were each given puzzles to solve.¹⁷³ After completing the puzzles,

162. *Id.* Another term used to describe students’ willingness and ability to use failures as learning opportunities is “self-efficacy.” See Sperling & Shapcott, *supra* note 132, at 49; see also CAROL S. DWECK, SELF-THEORIES: THEIR ROLE IN MOTIVATION, PERSONALITY, AND DEVELOPMENT 15 (2000).

163. See DWECK, MINDSET, *supra* note 142, at 46–47; BROWN ET AL., *supra* note 1, at 180–82.

164. See DWECK, MINDSET, *supra* note 142, at 46–47; BROWN ET AL. *supra* note 1, at 180–82.

165. BROWN ET AL., *supra* note 1, at 179–80.

166. *Id.*

167. *Id.*

168. *Id.*

169. *Id.*

170. *Id.*

171. See BROWN ET AL., *supra* note 1, at 181; see also Carol S. Dweck, *The Perils and Promise of Praise*, 65 EDUC. LEADERSHIP 34, 34–39 (2007) [hereinafter DWECK, *Praise*].

172. See BROWN ET AL., *supra* note 1, at 181; DWECK, MINDSET, *supra* note 142, at 71–74.

173. BROWN ET AL., *supra* note 1, at 181; DWECK, *Praise*, *supra* note 171, at 34–39.

some students were praised for being smart whereas some were praised for their hard work.¹⁷⁴ The students were then allowed to choose another puzzle to solve.¹⁷⁵ They were told they could choose between two puzzles—one of a similar difficulty to the previously solved puzzle, or one that was harder but from which they would learn by making the effort to try to solve it.¹⁷⁶ Out of the students who were praised for being smart, the majority chose the easier puzzle.¹⁷⁷ Out of the students who were praised for effort, ninety percent chose the harder puzzle.¹⁷⁸

Another aspect of Mindset Theory is its relationship to what psychologists call “stereotype threat.”¹⁷⁹ The theory of stereotype threat holds that when a student is worried about confirming a stereotype about her group identity, she gets anxious and performs more poorly.¹⁸⁰ In studies establishing the effects of stereotype threat, subtle psychological cues relating to group identity are given to a person before the person takes a test resulting in a significant effect on performance.¹⁸¹ For example, in one study, when people over sixty were instructed to read an article about how memory fades with age and then were given a memory test, they remembered only forty-four percent of the words on the test.¹⁸² In contrast, when others in a similar age group took the same test without first reading the article, they remembered fifty-eight percent of the words.¹⁸³ In a study of female college students, those who were reminded of their gender shortly before a mathematics test did worse on the test than the female students who did not receive the reminder.¹⁸⁴ However, one successful intervention for students at risk for stereotype threat is to expose students to the message that intelligence is malleable.¹⁸⁵ Studies have found that when students believe this message, the

174. *Id.*

175. *Id.*

176. *Id.*

177. *Id.*

178. *Id.*

179. See TOUGH, *supra* note 140, at 96–7. Psychologist Claude Steele coined the term “stereotype threat” in the early 1990’s. TOUGH, *supra* note 140, at 96–97.

180. See TOUGH, *supra* note 140, at 96–97; see also Sam Erman & Gregory M. Walton, *Stereotype Threat and Antidiscrimination Law: Affirmative Steps to Promote Meritocracy and Racial Equality in Education*, 88 S. CAL. L. REV. 307, 324 (2015) (“As students move up the academic ladder [to college] to take on more challenging material and interact with peers and instructors in less personal ways, they increasingly contend with the risk that others in the academic environment could view them through the lens of a negative stereotype. This fact causes psychological threat, distraction, and anxiety, which undermine academic performance. As we now know, the very same processes occur earlier in students’ academic experience, although perhaps to a lesser extent. They undermine adolescents’ performance then as they do adults’ performance later.”).

181. See TOUGH, *supra* note 140, at 96–97.

182. *Id.*

183. *Id.*

184. *Id.*

185. TOUGH, *supra* note 140, at 96–97; Erman & Walton, *supra* note 180, at 332 (“Teaching students that intelligence can grow with hard work on challenging problems can help all students perform better in school, but the benefits can be greatest for students who face negative stereotypes. In one study, mentors encouraged

effects of stereotype threat are diminished.¹⁸⁶

2. CHARACTER

Another approach to the question of how and why students become self-regulated learners is the concept of “character” explored by Paul Tough in his recent book *How Children Succeed: Grit, Curiosity, and the Hidden Power of Character*.¹⁸⁷ Tough draws, in part, upon Dweck’s work to argue that certain so called “soft skills” such as optimism, self-control, grit,¹⁸⁸ curiosity, and persistence are they key to success, rather than IQ.¹⁸⁹ Tough uses the general term “character” to refer to this set of traits.¹⁹⁰ His central thesis is that the key to developing these important character traits is for children to be able to face obstacles and failures but use them as a learning opportunity.¹⁹¹ In other words, the development of these character traits has a circular relationship with the cycle of self-regulated learning.¹⁹² Children who are able to become self-regulated learners, learning through their failures, develop these key character traits, and children who develop these key character traits are better primed to continue to use the cycle of self-regulated learning to strive and ultimately reach success in an endeavor.¹⁹³

Tough explains that children in the lowest economic spheres often have difficulty developing these key character traits because they face daunting obstacles and are therefore less able to overcome these obstacles, especially

seventh-grade students to adopt a growth mindset of intelligence. At the end of the year, students took the state-mandated math exam. The test revealed small gains from the intervention for boys relative to a control condition but large gains for girls, eliminating a gender gap in math performance.”).

186. TOUGH, *supra* note 140, at 96–97; Erman & Walton, *supra* note 180, at 332. Praise that focuses students on mastery goals can also be helpful in combatting stereotype threat. For example, in Erman & Walton, *supra* note 180, at 331–32, the authors explain:

One study examined the effect of a paper-clipped note appended to teachers’ feedback on middle school students’ essays. When the note read, “I’m giving you these comments so you have feedback on your essay,” 17% of black students chose to revise and resubmit their essay a week later. But when the note read, “I’m giving you these comments because I have high standards and I know that you can meet them”—disambiguating the reason for the critical feedback—71% of black students revised and resubmitted their essay. (Simultaneously, the percentage of white students who revised their essays rose from 62% to 87%.) When high school students were taught that critical feedback in general reflects high standards and teachers’ confidence in students’ ability to meet those standards, black students’ semester grades rose, reducing the achievement gap by 39%.”

Id.

187. TOUGH, *supra* note 140, at xv–xvi.

188. *Id.* at 74. Grit, as researchers in the area use the term, is defined as a passionate commitment to a single mission and unswerving dedication to that mission. *Id.*

189. BROWN ET AL., *supra* note 1, at 182; TOUGH, *supra* note 140, at xxiv, 58.

190. TOUGH, *supra* note 140, at xxiv.

191. *See id.* at 195.

192. *See id.*

193. *See id.*

without explicit guidance and support.¹⁹⁴ Interestingly, children in the highest economic spheres also often do not develop the character traits necessary for success.¹⁹⁵ Researchers have postulated that the phenomenon of “helicopter parenting” in which parents don’t give their children a chance to fail and learn from failure is often a factor in stopping children in higher economic spheres from developing the character traits tied to success.¹⁹⁶

One well known study that triggered researchers’ interest in character traits related to success is informally known as the marshmallow test, an experiment designed to test the willpower of four-year olds.¹⁹⁷ Walter Mischel, a professor of psychology, conducted the experiment in the late 1960s.¹⁹⁸ In the test, a child was led to a small room, seated at a desk, and a treat such as a marshmallow was placed in front of the child.¹⁹⁹ A bell was also placed on the desk.²⁰⁰ The researcher explained to the child that the researcher was going to leave the room.²⁰¹ If the child wanted to eat the Marshmallow, he just needed to ring the bell, and the researcher could return and the child could have the marshmallow.²⁰² The researcher also explained to the child that if he did not ring the bell but instead waited fifteen minutes²⁰³ until the researcher returned on her own, the child would get two marshmallows instead of the one.²⁰⁴ The experiment was designed to study techniques children use to resist temptation.²⁰⁵ However, a decade after the study, Mischel decided to check up on the children in the study, and he found striking correlations between the time the children waited for the marshmallow and their academic success.²⁰⁶ These correlations prompted other researchers to study which character traits predict success, whether the traits are teachable, and if so, how to teach children to develop these character traits.²⁰⁷

The research into the area is voluminous and varied, but some common themes have emerged.²⁰⁸ As Tough argues, along with the trait of self-control exhibited in the marshmallow test, character traits such as grit, curiosity, optimism and

194. *Id.* at 1–48, 192, 195.

195. *Id.* at 81–84.

196. *Id.*

197. *Id.* at 62–63; BROWN ET AL., *supra* note 1, at 162–63.

198. TOUGH, *supra* note 140, at 62–63; BROWN ET AL., *supra* note 1, at 162–63.

199. TOUGH, *supra* note 140, at 62–63.

200. *Id.*

201. *Id.*

202. *Id.*

203. BROWN, ET AL., *supra* note 1, at 162.

204. TOUGH, *supra* note 140, at 62–63; BROWN, ET AL., *supra* note 1, at 162–63.

205. TOUGH, *supra* note 140, at 62–63.

206. *Id.*

207. *Id.*

208. *Id.* at 63–74.

persistence are correlated to success.²⁰⁹ Moreover, these traits are teachable.²¹⁰ A few educational institutions across the country are trying to incorporate these findings into their curriculum by using techniques to make students aware of the importance of these traits and even monitor students' acquisition of the traits.²¹¹ In the KIPP charter schools, school administrators have introduced the concept of character "report cards" in which different key character traits of students are assessed and students are led through a process of reflection on how to improve in the areas that still need further development.²¹² In homage to the famous marshmallow test, the KIPP schools have even produced t-shirts for students that read "Don't eat the marshmallow" as a reminder of the importance of self-control.²¹³

Psychologist Angela Duckworth has focused on one of the character traits discussed by Tough—grit—in research about how grit is linked to vocational achievement and success.²¹⁴ In her research, she has defined grit as meaning "working strenuously toward challenges, [and] maintaining effort and interest over years despite failure, adversity, and plateaus in progress."²¹⁵ Duckworth explains that "[t]he gritty individual approaches achievement as a marathon; his or her advantage is stamina. Whereas disappointment or boredom signals to others that it is time to change trajectory and cut losses, the gritty individual stays the course."²¹⁶

Duckworth has collaborated with Dweck and concluded that there is an inextricable connection between grit and growth mindset.²¹⁷ Children with a growth mindset tend to be grittier, and a growth mindset helps students to be grittier.²¹⁸ As observed by Eduardo Briceno, the CEO of Mindset Works, a company co-founded with Dweck, "It's really hard to have high tolerance if you

209. *See id.* at 74–77.

210. *See id.* at xx–xiv, 80.

211. *See id.* at 75–80.

212. *See id.* at 98–99.

213. *See id.* at 95.

214. Angela Duckworth et al, *Grit: Perseverance and Passion for Long-Term Goals*, 92 J. PERSONALITY & SOC. PSYCHOL. 1087, 1087–101 (2007).

215. *Id.* at 1087–88.

216. *Id.* at 1088.

217. *See* KRISTIN M. WHITE, IT'S THE STUDENT, NOT THE COLLEGE: THE SECRETS OF SUCCEEDING AT ANY SCHOOL—WITHOUT GOING BROKE OR CRAZY 65–83 (2015) (observing that grit is "intrinsic to developing a 'growth mindset'").

218. *See, e.g., id.*; Deborah Perkins-Gough, *The Significance of Grit: A Conversation with Angela Lee Duckworth*, 71 EDUC. LEADERSHIP 14, 14–20 (2013); Aaron Hochanadel & Dora Finamore, *Fixed and Growth Mindset in Education and How Grit Helps Students Persist in the Face of Adversity*, 11 J. OF INT'L EDUC. RESOURCES 47, 48–49 (2015); Clifton B. Parker, *Perseverance Key to Children's Intellectual Growth, Stanford Scholar Says*, STANFORD NEWS (April 29, 2015), <http://news.stanford.edu/news/2015/april/dweck-kids-potential-042915.html> [<http://perma.cc/MAQ9-SJLY>] ("Grit is perseverance, or 'stick-to-it-iveness.' All difficult, long-term achievements require it, and research by Angela Duckworth and her colleagues at the University of Pennsylvania show that a growth mindset fosters it. Grit is important for children and adults alike because if you are taking on challenges, setbacks are inevitable.").

believe that your abilities or intelligence are fixed . . . Because if you believe ‘I can’t change my own abilities,’ then trying hard doesn’t make any sense. It’s like pounding your head against the wall.’”²¹⁹ Grit, in turn, can sustain a growth mindset over an extended period of time, thereby helping one reach arduous goals.²²⁰ Duckworth has also observed that grit has a relation to interest and passion, or, in Tough’s words, curiosity.²²¹ She has explained that to help students develop grit “we also need to find and help them cultivate their passions. That’s as much a part of the equation here as the hard work and the persistence.”²²²

III. COGNITIVE SCIENCE AND THE LEGAL WRITING CLASSROOM

Little, if any, research has been done on how these four non-intuitive truths about learning affect legal education generally and legal skills training, such as legal writing, specifically. Each of these areas certainly deserves more development than is practicable here. This section provides an overview of how these surprising findings may suggest changes in the legal writing classroom in order to bring the teaching of legal writing into accordance with scientific understandings of cognition and what is actually effective for long-term retention and application of acquired knowledge. In so doing, the section will draw on recent works of scholarship regarding teaching and learning in legal education as well as suggest possible changes that have not yet been explored by the legal academy. The section is meant to be a beginning, not an end, to a discussion about best practices for long-term learning in legal education.

A. GENERATIVE LEARNING IN THE LEGAL WRITING CLASSROOM

There are a number of educational theories and approaches, some overlapping, which emphasize unguided or minimally guided instruction, thereby incorporating some degree of “generative” learning to the extent that students discover a solution themselves rather than recall a taught solution. These include problem-based learning, in which students extract general principles by working through problems; experiential learning, in which students learn through real-world experience; constructivist learning, in which students learn best by constructing their own learning; and discovery-based learning, in which students are encouraged to discover answers on their own in order to promote deep learning.²²³ Various scholars have encouraged using these theories in legal

219. Tovia Smith, *Does Teaching Kids To Get ‘Gritty’ Help Them Get Ahead?*, NPR EDUC. (March 17, 2014), <http://www.npr.org/sections/ed/2014/03/17/290089998/does-teaching-kids-to-get-gritty-help-them-get-ahead> [<http://perma.cc/XE9A-692S>].

220. Chaya R. Jain, *What is Self-Growth*, 7 INT’L J. OF PROCESS EDUC. 41, 46–48 (2015).

221. Duckworth, *supra* note 214, at 1087–88.

222. *Id.*

223. Pollman, *supra* note 4, at 300 n.10.

education.²²⁴

One area that has received significant recent attention is incorporating experiential learning into the law school curriculum. The ABA recently instituted a guideline mandating that ABA approved law schools require at least six credits of experiential learning in their curriculum.²²⁵ Although the ABA requirement allows for simulated experiential learning in classrooms,²²⁶ in a recent text, *The New 1L: First Year Lawyering with Clients*, the editors of the text cogently argue for the inclusion of experiential learning in the form of actual client contact in the first year curriculum in order to create deep learning for 1L students beyond what can be achieved in simulated classrooms.²²⁷ This method of 1L experiential learning was pioneered by Yale Law School, which admits first year students into its legal clinics.²²⁸ The preface to the text starts with a quote from John Dewey, one of the most well-renowned educational theorists of the twentieth century: “Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results.”²²⁹ To the extent experiential learning involves students discovering solutions to problems and learning through that discovery, rather than recalling an answer to a problem, experiential learning involves some amount of generative learning. However, in experiential learning through legal clinics, there is a large degree of instruction and oversight from licensed attorneys and therefore aspects of experiential learning do not fall completely or neatly into the category of generative learning as professors Rodeiger and McDaniel discuss the concept.

Although experiential learning has become an accepted, and now required, part of legal education, the more basic idea of generative learning in the form of unguided or minimally guided instruction followed by corrective feedback has

224. See, e.g., Gabriël A. Moens, *The Mysteries of Problem-Based Learning: Combining Enthusiasm and Excellence*, 38 U. TOLEDO L. REV. 623, 623–24 (2007); Carol McCrehan Parker, *Writing Is Everybody's Business: Theoretical and Practical Justifications for Teaching Writing Across the Law School Curriculum*, 12 LEGAL WRITING: J. LEGAL WRITING INST. 175, 180 (2006) (discussing constructivist learning theory); Adam Lamparello & Charles E. MacLean, *Experiential Legal Writing: The New Approach to Practicing Like A Lawyer*, 39 J. LEGAL PROF. 135, 144–57 (2015); Abigail Loftus DeBlasis, *Building Legal Competencies: The Montessori Method as a Unifying Approach to Outcomes-Based Assessment in Law Schools*, 42 OHIO NORTHERN U. L. REV. (forthcoming) (discussing Montessori Method as a species of discovery-based or inquiry-based learning and applying aspects of the theory to legal education); Diana R. Donahoe, *An Autobiography of A Digital Idea: From Waging War Against Laptops to Engaging Students with Laptops*, 59 J. LEGAL EDUC. 485, 488–90 (2010) (discussing use of technology in the legal classroom as a species of discovery-based learning).

225. See Adam Lamparello & Charles E. MacLean, *A Proposal to the ABA: Integrating Legal Writing and Experiential Learning into A Required Six-Semester Curriculum That Trains Students in Core Competencies, 'Soft' Skills, and Real-World Judgment*, 43 CAP. U. L. REV. 59, 60 (2015).

226. STANDARDS AND RULES OF PROCEDURE FOR APPROVAL OF L. SCHS. §§ 303(a)(3), 304(a) (AM. BAR. ASS'N 2015).

227. THE NEW 1L, *supra* note 141, at 4.

228. *Id.*

229. *Id.* at xi; see also Dorothy H. Evensen et al., *Where Have You Gone, John Dewey?: Locating the Challenge to Continue and the Challenge to Grow as a Profession*, 108 PENN ST. L. REV. 19, 20–21 (2003).

received criticism. Proponents of “cognitive load theory” are “concerned with the learning of complex cognitive tasks, in which learners are often overwhelmed by the number of information interactive elements that need to be processed simultaneously before meaningful learning can commence.”²³⁰ Some critics of generative learning models have relied on cognitive load theory arguing that in order for students to avoid too large of a cognitive load for meaningful learning, they need more initial instruction than is given in the unguided and minimally guided educational models.²³¹

Professors Roediger and McDaniel’s work indicates that cognitive science has shown clear benefits to employing the desirable difficulty of generative learning. Therefore, any debate over the use of these models should center on when and how to best employ these models, rather than whether to use generative learning at all. Most legal writing classrooms, however, miss opportunities for generation by focusing heavily on “how to” instructions. In most legal writing classrooms, the earliest lessons in legal writing focus on “how to” steps and formulas that break down legal writing into discrete, step-by-step processes: how to outline a rule to create an overarching structure for a piece of writing, how to identify single legal issues using the overarching rule, and, perhaps the most classic example of a “how to” formula in legal writing instruction, how to organize a single legal issue using the issue, rule, application, and conclusion (“IRAC”) form or one of the myriad alternatives to IRAC.²³² Professor Anthony Niedwiecki describes this “how to” approach:

[I]n skills-based courses . . . the instruction is generally focused on how to perform a particular legal task. For example, in legal writing courses, students are told how to organize their legal analysis using the “IRAC” format (issue, rule, application, and conclusion) or some variation. The focus is rarely placed on the underlying theory of why this organization is best, or when to apply exceptions to this rule. I describe this mode of instruction as the “how to method” of teaching because of its reliance on teaching students various steps to completing a particular legal task. With a reliance on . . . the “how to method” in skills-based courses, most students are not effectively taught how to transfer the learned knowledge and skills to new and novel situations.²³³

230. Pollman, *supra* note 4, at 298, 299.

231. *See id.* at 300, n.10; *see also* Paul Kirschner et al., *Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching*, 4 *EDUC. PSYCHOLOGIST* 75, 80 (2006); Cindy E. Hmelo-Silver et al., *Scaffolding and Achievement in Problem-Based and Inquiry Learning: A Response to Kirschner, Sweller, and Clark*, 4 *EDUC. PSYCHOLOGIST* 99, 101 (2007).

232. Niedwiecki, *supra* note 4, at 33, 34; Judith B. Tracy, “*I See and I Remember; I Do and Understand*” *Teaching Fundamental Structure in Legal Writing Through the Use of Samples*, 21 *TOURO L. REV.* 297, 309–11 (2005) (discussing use of IRAC formulas).

233. Niedwiecki, *supra* note 4, at 33, 34; *see also* Tracy, *supra* note 232, at 309–11 (“Perhaps because of the alien nature of legal writing for the beginning law student, and the teacher’s difficulty in explaining how to organize the legal document, many teachers of legal reasoning and writing teach students to apply a formula to

In order to incorporate generative learning, legal writing professors could cut back on the initial how to instructions to some degree such that instead of being *told* how to, students could *discover* how to, or, perhaps how *not* to, followed by corrective feedback.

Although the possibilities for incorporating generative learning in the legal writing classroom are many and varied, one effective way may be to include this desirable difficulty from the very first assignment. Many legal writing classrooms start the year with a simple, closed universe office memo assignment in which students are given a writing prompt and just one or two legal authorities on which to base their answer, and often just one single legal issue is at play in the problem.²³⁴ Typically, before getting this assignment, students are given instruction on the use of authority, the topic of predictive writing generally, the office memo as a document genre specifically, and IRAC form or its equivalent as a means to organize a single legal issue. Imagine instead, the assignment is simply given without prior instruction. The students are told that they are to produce a document for a senior attorney for whom they are working, answering X question using Y authority. They are asked to do this in a certain set period of time and then turn it in. In this iteration of the assignment, students would then have to generate (rather than recall) the answers to a number of pertinent questions: What is the precise legal issue at play? Which of the legal authorities are best to address the issue and why? What overall structure makes sense for the document? How should the discussion of the discrete legal issue be organized? Although they will almost certainly not arrive at a document that would be acceptable in the legal field, the professor could eventually lead students to the correct answer with various forms of corrective feedback (oral feedback, written feedback, a sample with which to compare their own document) and could require a re-write based on the corrective feedback. Thus the “how to” instruction would follow, rather than precede, the students’ first attempt at the assignment. In this way, the long-term learning benefits of the desirable difficulty of generative learning could be harnessed, but the corrective feedback would ensure that any confusion would be cleared up and students would be set on the right path toward learning the skills of legal analysis and communication.

Another possible way to harness the power of generative learning in the legal writing classroom is through the use of student-created grading rubrics. The use of grading rubrics for legal writing assignments has become a widely used

express their analysis. This is often referred to with an acronym. The most commonly used acronym is IRAC (“Issue, Rule, Application, Conclusion”), or some variation of that. However, the imposition of a formula may create a misimpression among students that all analyses can be expressed and fully explained within it and that there is only one way in which lawyers present information”).

234. Tracy, *supra* note 232, at 304–05 (noting that the first assignment in the course requires students to analyze and synthesize a limited body of authority relevant to a hypothetical problem).

practice in legal writing classrooms.²³⁵ In the legal writing context, a grading rubric is “a set of detailed grading guidelines used to determine a numerical score or letter grade through application of articulated guidelines.”²³⁶ The assignment is broken down into identifiable components, and the rubric gives “detailed descriptions of how points are earned by explaining levels of sophistication that characterize a narrow point range within each component.”²³⁷ Moreover, “[t]he point values may vary for each assignment by what is expected at each stage in the semester, and by what is emphasized and taught before each assignment.”²³⁸ Typically, the professor creates the rubric and uses it to grade an assignment, and some professors give their students the grading rubric before the assignment is due as a reference for students to check and revise their own work.²³⁹ The benefits of using rubrics in this way include clear expectations for the students and more consistent and transparent grading.²⁴⁰

If, instead of the professor creating the rubric from the first instance, students were asked to create a first draft of the rubric, followed by corrective feedback from the professor in the form of suggestions regarding what may need to be added or modified in the rubric, students would get the additional benefits of a generative learning exercise. Although there would be some instruction ahead of time, perhaps in the form of reading of samples or lecture on various components of a writing genre, students would still get the benefit of distilling the key aspects from the instruction and creating a model for the targeted skill that can be used not just for the problem at hand, but for future problems, thereby to some degree generating rather than just recalling a solution. Consider, for example, the facts section of an appellate brief. Students may be asked to read model appellate briefs focusing on the narrative in the facts section, students may be asked to read a text regarding best practices and theories about writing fact sections, and a professor may lead classroom discussion about aspects of writing facts sections such as narrative theory, storytelling, and theme. Then, rather than a professor creating a grading rubric with which to grade the facts section of students’ appellate briefs, instead, students could be asked to distill that information into a grading rubric consisting of key principles that any fact section should possess, such as inclusion of all legally significant facts, logical organization, exclusion of legal argument, etc. After the students created a first draft of such a rubric, the professor could provide corrective feedback to make sure the rubric was complete and correct.

235. See Jessica Clark & Christy DeSanctis, *Toward a Unified Grading Vocabulary: Using Rubrics in Legal Writing Courses*, 63 J. LEGAL EDUC. 3, 7–8 (2013).

236. *Id.*

237. *Id.* at 8.

238. *Id.* at 7.

239. *Id.* at 8.

240. *Id.*

Student-created rubrics may be compared to the practice of outlining done in most casebook classes in which students are asked to distill the key principles of law that have been explicated in class through the case method and Socratic dialogue. Outlining has aspects of generative learning to the extent students are distilling the rule of law and determining how it should be applied in a specific situation from the Socratic dialogue in class rather than simply being told the black letter law. This is a practice that is generally missing in legal writing classrooms, as legal writing texts generally focus on “how to” steps illustrated by a small number of examples. Thus, student-created rubrics have the benefit of harnessing at least some aspects of the desirable difficulty of generative learning.

B. GETTING BEYOND LEARNING STYLES TO STRUCTURE BUILDING IN THE LEGAL WRITING CLASSROOM

The legal writing classroom has not been immune to the pervasive belief in the educational community generally that teaching to students learning styles is a key to successful learning. Many articles have been written explaining how to use learning styles in the legal writing classroom, and many professors spend time identifying their students’ learning styles and developing classes that convey information in learning styles matched to their students’.²⁴¹ Although learning styles may have a place in the legal writing classroom, the idea of structure building has received relatively less attention but may prove to be much more helpful to students’ long-term retention of skills.

The idea of structure building and the related concept of example and rule-based learning is not completely foreign in the legal pedagogy scholarship generally, nor in the legal writing scholarship in particular. In her groundbreaking 2001 article, *I Know I Taught Them How to Do That*, Professor Laurel Currie

241. See, e.g., Eric A. DeGroff & Kathleen A. McKee, *Learning Like Lawyers: Addressing the Differences in Law Student Learning Styles*, 2006 BYU EDUC. & L.J. 499, 509 (2006) (“Learning style theories have gained a significant following over the past forty years among academics and increasingly among corporate and government trainers. More recently still, learning style theories have caught the attention of legal educators.”); Jason S. Palmer, “*The Millennials Are Coming!*”: *Improving Self-Efficacy in Law Students Through Universal Design in Learning*, 63 CLEV. ST. L. REV. 675, 701 (2015) (“When you teach to accommodate diverse learning styles, all learners are included in the learning process, not just those whose learning is similar [to the professors].” Law professors must recognize that they are teaching to Millennial students who embrace a variety of learning styles: verbal (learning through written text), visual (learning through pictures, diagrams, models), oral (learning through talking out ideas), aural (learning through listening to lectures, discussions, or recordings), tactile (learning through touching and manipulating material) and kinesthetic (learning through moving and doing.”) (citation omitted); see also Niedwiecki, *supra* note 4, at 34–35 (“Although an increasing number of legal education scholars have begun discussing learning theory as it relates to law school education and teaching, they have just touched the surface of the discipline. Much of this literature has only focused on what we as legal educators can do to make the classroom better suited to the different learners that come to law school. Many educators, for example, have proposed different techniques to make the classroom more inviting to every student regardless of how they individually learn. Adapting law school classrooms to every learning style, although a good step toward making the classroom more effective, misses the main purpose of trying to teach students how to become lawyers—to be able to practice law without constant instruction.”).

Oates, a pioneer in the legal writing field, describes the frustration professors face when “we know that we have taught our students how to do something, [but] they do not seem to be able to use what it is we have taught them.”²⁴² In other words, the frustration that comes from teaching methods that do not lead to students’ long-term retention of skills; in short, teaching that does not “stick.” Considering the moat and tumor problems as discussed above,²⁴³ Oates suggests that better use of examples with students can help students retain skills for long-term retention and application in varied contexts.²⁴⁴ Specifically, Oates suggests that students be provided with multiple examples that have similar structures but different surface features, that professors emphasize the underlying structures rather than the surface features, that professors ask students to determine how various examples are similar and different, and that students be encouraged to look to prior problems for help in solving current problems.²⁴⁵ Following Oates’ suggestions, professors may be able to help low-structure builders and example learners see the underlying structures and rules necessary for long-term retention and application of the skills of legal analysis and communication.²⁴⁶

However, while Oates’ article certainly had an important impact in the legal writing field, her suggested method for using examples has not yet become the norm in classrooms across the country. In a recent article, *The Sincerest Form of Flattery: Examples and Model-Based Learning in the Classroom*, Professor Terrill Pollman explains, “to date, many professors have been reluctant to expand the use of examples or samples in the classroom”²⁴⁷ in part because professors are worried that students will follow the sample with “a dogged-literal-mindedness regardless of subject matter and context.”²⁴⁸ Professor Pollman concludes that “[i]n summary, legal writing scholars have been ambivalent on the use of examples, recognizing both pros and con[s].” Pollman adds to the scholarship on using samples and models in the classroom incorporating the idea of “cognitive load theory,” a theory which posits that in learning complex tasks “learners are often overwhelmed by the number of interactive information elements that need to be processed simultaneously before meaningful learning can commence.”²⁴⁹ Pollman suggests using specific techniques such as using “worked examples,” that is, employing examples in conjunction with a step-by-

242. Oates, *supra* note 59, at 1.

243. *Id.* at 1–2 (citing Mary L. Gick & Keith J. Holyoak, *Analogical Problem Solving*, 12 COGNITIVE PSYCHOL. 306, 349 (1980)).

244. *See id.* at 7–16.

245. *See id.*

246. *See generally* Tracy, *supra* note 232.

247. Pollman, *supra* note 4, at 300–01.

248. Pollman, *supra* note 4, at 314 (quoting Helene S. Shapo & Mary S. Lawrence, *Surviving Sample Memos*, 6 PERSPECTIVES 90, 90 (1998), <https://info.legalsolutions.thomsonreuters.com/pdf/perspec/1998-winter/1998-winter-11.pdf> [<https://perma.cc/WB2Z-NFBB>]).

249. Pollman, *supra* note 4, at 299 (quoting Fred Paas et al., *Cognitive Load Theory: New Conceptualizations, Specifications, and Integrated Research Perspectives*, 22 EDUC. PSYCHOL. REV. 115, 116 (2010)).

step explanation of the solution to a problem,²⁵⁰ and “completion problems,” meaning techniques in which a partial solution is given and students are asked to complete the rest of the solution.²⁵¹ Through these techniques and others, Pollman argues, the “cognitive load” on students can be decreased so that examples and models can be best employed for student learning.²⁵²

In a related concept, in her book *Legal Writing in the Disciplines*, Professor Teri McMurtry-Chubb pioneers the idea of helping students build upon their preexisting mental structures.²⁵³ McMurtry-Chubb sets out a discipline-specific path by which professors can “meet students at the point of their last educational experience” in order to “translate legal methodologies into a student’s existing disciplinary methodological framework” by explicitly tying the different writing genres²⁵⁴ within the legal discipline to the writing genres the students are familiar with from their previous education.²⁵⁵ The idea of building on the mental models or structures that the student has already created is in line with the concept of helping students who may be low structure builders to more easily create mental models appropriate for legal analysis.

Professors Roediger and McDaniel’s work suggests that the work of Professors Oates, Pollman, McMurtry-Chubb and others who have started to explore the idea of structure building and example learning should be both heeded and refined through trial in the law school classroom in order to maximize students’ long-term retention of skills.

C. SPACED, VARIED, AND INTERLEAVED PRACTICE IN THE LEGAL WRITING CLASSROOM

One of the universal principles of legal writing instruction is that predictive (also called objective) writing is taught as a pre-cursor to persuasive writing.²⁵⁶ In most, if not all, two semester legal research and writing programs, the entire

250. See Pollman, *supra* note 4, at 305–06, 315–16.

251. *Id.* at 329.

252. *Id.* at 298, 315.

253. See TERI A. MCMURTRY-CHUBB, *LEGAL WRITING IN THE DISCIPLINES: A GUIDE TO LEGAL WRITING MASTERY* xiii–xiv (2012).

254. *Id.* at xiii. “Genre” in this context is defined as a type of discipline-specific writing; for instance in law writing genres would include a legal memoranda, a client letter, a motion brief, appellate brief, etc. *Id.* at 5.

255. *Id.* at xiii.

256. See Tracy, *supra* note 232, at 304 (“Given the realities of practice, even though students may arrive in law school eager to assume an advocacy role immediately, they first should be taught to undertake objective analysis and writing, so that they develop the skills which are critical to responsible lawyering.”); Johanna K.P. Dennis, *The Renaissance Road: Redesigning the Legal Writing Instructional Model*, 38 S.U.L. REV. 111, 130 (2010) (“The traditional legal writing curriculum involves two graded semesters in the first year: a fall semester involving predictive writing and a spring semester involving persuasive writing and advocacy The main assignment in the predictive writing semester is typically the office memorandum, while the main assignment in the persuasive writing semester is typically the appellate brief.”); SECTION OF LEGAL EDUC. & ADMISSIONS TO THE BAR, AM. BAR ASS’N, SOURCEBOOK ON LEGAL WRITING PROGRAMS, ABA Section of Legal Education and Admissions to the Bar 44–46 (Eric B. Easton ed., 2d ed. 2006) (describing a typical two-semester program as

first semester is spent on predictive writing, whereas the second is spent on persuasive writing.²⁵⁷ Legal writing text books reflect this progression, with texts marketed as full-year texts first addressing predictive writing and then persuasive writing sequentially, and texts marketed as first or second semester texts addressing one or the other type of writing.²⁵⁸

During this first semester, most legal writing classrooms focus on predictive writing by having students write two to three office memos of increasing complexity.²⁵⁹ Some programs also incorporate other predictive documents such as client letters or bench briefs into the first semester, but often after instruction and practice of the office memo is complete, taking the different types of documents in sequence.²⁶⁰ Second semester, most, if not all, programs move on to persuasive writing by asking students to write documents such as a motion brief and an appellate brief.²⁶¹

It would be all but heresy in legal writing academia to teach both predictive writing and persuasive writing from early on in the first semester, and perhaps less controversial, but nonetheless in no way common, to intersperse the practice of different types documents throughout a two-semester program rather than addressing them sequentially. However, cognitive science findings on the benefits of spaced, interleaved, and varied practice suggest that this may in fact be the optimal choice for students' long-term retention of the skills covered in legal writing classes.²⁶²

including objective memoranda first semester and persuasive writing assignments second semester) [hereinafter ABA SOURCEBOOK].

257. See Tracy, *supra* note 232, at 304.

258. See generally LAUREL CURRIE OATES & ANNE ENQUIST, *THE LEGAL WRITING HANDBOOK: ANALYSIS, RESEARCH, & WRITING* (5th ed. 2010) (addressing objective/predictive and persuasive writing in sequence); JOHN C. DERNBACK ET AL., *LEGAL WRITING AND LEGAL METHOD* (4th ed. 2010) (addressing objective/predictive and persuasive writing in sequence); LINDA H. EDWARDS, *LEGAL WRITING AND ANALYSIS* (3d ed. 2011) (addressing objective/predictive and persuasive writing in sequence); RICHARD K. NEUMANN JR. & SHEILA SIMON, *LEGAL WRITING* (2d ed. 2011) (addressing objective/predictive and persuasive writing in sequence); CHARLES R. CALLEROS, *LEGAL METHOD AND WRITING* (6th ed. 2011) (addressing objective/predictive and persuasive writing in sequence); LAUREL CURRIE OATES & ANNE ENQUIST, *JUST MEMOS* (3d ed. 2011) (first semester book addressing objective/predictive but not persuasive writing); LAUREN CURRIE OATES ET AL., *JUST BRIEFS*, (3d ed. 2013) (second semester book addressing persuasive but not objective/predictive writing); MARY BETH BEAZLEY, *A PRACTICAL GUIDE TO APPELLATE ADVOCACY* (4th ed. 2014) (second or third semester book addressing persuasive but not objective/predictive writing with a specific focus on appellate advocacy).

259. See ABA SOURCEBOOK, *supra* note 256, at 45 (typically first semester assignments are focused on "objective office memoranda of increasing complexity").

260. See Michael R. Smith, *Alternative Substantive Approaches to Advanced Legal Writing Courses*, 54 J. LEGAL EDUC. 119, 126 (2004) ("Whereas most first-year legal writing courses introduce students to legal memoranda and court briefs, upper-level electives taking the horizontal advancement approach introduce students to other types of legal writing. The progression is "horizontal" because each course is an introductory course covering a new and different type of legal document."); Lucia Ann Silecchia, *Legal Skills Training in the First Year of Law School: Research? Writing? Analysis? Or More?*, 100 DICK. L. REV. 245, 285 (1996) (arguing for inclusion of more and different types of legal documents in first year legal writing classes).

261. See ABA SOURCEBOOK, *supra* note 256, at 46.

262. See *supra* Part II.C.

To take full advantage of the benefits of spaced practice, it makes sense to use the timeframe of the entire two semester program in which to space out the practice. As discussed above, cognitive science suggests that the “forgetting” that happens when practice is spaced is beneficial, precisely because the effort it takes to recall the skills after the period of “forgetting” creates deeper learning of the skills.²⁶³ Thus, it makes sense to maximize the number of episodes of practice and periods of “forgetting” over as long a stretch of time as practicable in order to fully benefit from this “desirable difficulty.”²⁶⁴ Take, for example, the learning associated with writing an office memo, the typical assignment focused on in the first semester of legal writing courses. Students are typically asked to write two or three office memos in a row their first semester before moving on to another document genre.²⁶⁵ If instead, this learning was stretched over the entire two-semester program, the periods of practice, forgetting, and recalling would be maximized rather than “massed” into the beginning of the first semester.

Moreover, to introduce varied and interleaved practice, other document genres could be introduced after the first office memo assignment and before the next office memo assignment. Another document genre that employs predictive/objective skills, such as a client letter, could be introduced, creating varied practice comparable to tossing the bean bags from both two and five feet away rather than just three.²⁶⁶ Additionally, to introduce interleaving of practice, the skill of predictive writing could be introduced in the form of a motion brief or other trial document. As in the artist identification study, where students learned more from noticing the differences between the artists’ works rather than the similarities in the same artist’s pieces, students would likewise learn from the comparisons between the different document genres and the related but distinct skills of predictive and persuasive writing.²⁶⁷

Thus, to implement this type of spaced, varied, and interleaved practice into a legal writing curriculum, instead of progressing document genre by document genre, the curriculum could instead progress client problem by client problem. A client problem could be introduced, and a number of documents related to that problem could be assigned in sequence: perhaps first an office memo, then a client letter, then a motion brief. Next, another client problem could be introduced, and a number of documents assigned related to that problem, and so on for the entire two-semester sequence. Also, to avoid the trap of “blocked” practice, in which different skills are practiced in the same order, thus creating a hidden form of “massed” practice, as when a hockey drill is practiced from the

263. See *supra* Part II.C.

264. See *supra* Part II.C.

265. See ABA SOURCEBOOK, *supra* note 256, at 46.

266. See BROWN ET AL., *supra* note 1, at 46, 51; Kerr & Booth, *supra* note 91.

267. See BROWN ET AL., *supra* note 1, at 53–54; see also Kornell & Bjork, *supra* note 70, at 585–92 (artist identification study).

same spot on the ice every time, different types of documents could be practiced in various orders as the problem required.²⁶⁸ For instance, one problem may begin with a client letter followed by a motion to dismiss. Another may begin with an office memo followed by a brief in response to a motion for summary judgment.

The most pressing concern to this change in curriculum is likely to be the introduction of persuasive writing skills in the first semester. The justification given for leaving persuasive writing for second semester and focusing solely on predictive writing first semester is that the ability to do predictive analysis is a necessary precursor skill to persuasive writing.²⁶⁹ No doubt, there is great truth in this relation between the two skills. Solid persuasive writing must be founded upon an objective understanding of the legal problem at hand. However, the cognitive scientific research suggests that the fallacy in this approach lies in insisting that the skill of objective/predictive writing must be *mastered* before moving on to persuasive writing. This massed approach to skill acquisition, in which one skill is practiced and mastered before moving on to the next, ignores the benefit of varied and interleaved practice for acquisition of skills, including high level cognitive skills, that has been shown in studies such as the artists' identification study and the bird classification study.²⁷⁰ These studies suggest that students learn from seeing *differences* as well as similarities.²⁷¹ The benefit that comes from seeing differences is precisely what helps with the acquisition of high level conceptual knowledge.²⁷² Thus, a student may benefit more from writing an office memo and then a motion brief rather than two office memos in a row precisely because the student can compare the two different forms of writing. Thus, cognitive science suggests that moving on to persuasive writing before completely mastering predictive writing may actually be the best way to eventually master, and moreover, retain, both skills.²⁷³

No doubt, spacing, varying, and interleaving students' writing skills practice over the course of a two semester program would lead to slower initial gains in skill acquisition; the cognitive science literature is clear on that point.²⁷⁴ Likewise, studies have clearly shown that students often perceive themselves as learning better from massed practice, suggesting students may not be pleased

268. BROWN ET AL., *supra* note 1, at 65–66.

269. See Tracy, *supra* note 232, at 304.

270. See BROWN ET AL., *supra* note 1, at 52–54; Kornell & Bjork, *supra* note 70, at 585–92 (artist painting style study); Jacoby et al., *supra* note 108, at 1441–42 (bird classification study).

271. See BROWN ET AL., *supra* note 1, at 52–54.

272. See *id.*

273. See *supra* notes 263–265.

274. See BROWN ET AL., *supra* note 1, at 50–54; Kornell & Bjork, *supra* note 70, at 585–92 (although objective learning outcomes of study were better when interleaved practice was used, learners insisted that they learned better with massed practice).

with such a change in curriculum.²⁷⁵ However, it is equally clear that in the many contexts studied, spaced, varied, and interleaved practice has led to better gains in the long-term retention of skills, despite students' and educators' assumptions to the contrary.²⁷⁶ Thus, given the findings of cognitive science, it is time to at least consider the place of such changes in the legal writing curriculum.

D. "SUBVERTING THE CURVE": USING MINDSET THEORY, CHARACTER,
AND THE HUMANIZING LAW SCHOOL MOVEMENT TO CREATE
SELF-REGULATED LEARNERS, DESPITE NORMALIZED GRADING

Teaching students to learn through both their successes and failures, in effect teaching students to become self-regulated learners, is a key to long-term learning, and thus deserves a central role in legal education pedagogy and curriculum development.²⁷⁷ This goal, however, is perhaps harder than in many other settings because of the structure of law school grading on a normalized curve.²⁷⁸ In this system, students compete for grades, and in many law schools, academic attrition is the norm.²⁷⁹ At the top, students are competing for the best grades that will lead to prestigious accolades such as law review membership, eventually leading to better job placement.²⁸⁰ At the bottom, students are competing for academic survival.²⁸¹ In this system where success is measured against others' performance and failure is costly, teaching students to "fail successfully" is a challenge. That grades are ultimately based on a student's performance relative to their classmates' performance encourages the setting of performance goals rather than mastery goals, interfering with students' development of self-regulated learning skills.²⁸² The focus in law school on performance relative to peers as shown through grades is also in contradiction to the focus of a growth mindset on progress over time rather than a static snapshot of

275. See BROWN ET AL., *supra* note 1, at 50–54; Kornell & Bjork, *supra* note 70, at 585–92.

276. See *supra* note 114.

277. See Niedwiecki, *supra* note 4, at 34–35.

278. E. Scott Fruehwald, *How to Help Students from Disadvantaged Backgrounds Succeed in Law School*, 1 TEX. A&M L. REV. 83, 100 (2013) ("[G]rade curves and competition can produce performance and work avoidance goals, especially in poor students.").

279. See Michael H. Schwartz, *Improving Legal Education by Improving Casebooks: Fourteen Things Casebooks Can Do to Produce Better and More Learning*, 3 ELON L. REV. 27, 27–28 (2011) ("Too many students don't learn what their professors want them to learn. In fact, some American law schools have first-year academic attrition rates as high as 35%. Twenty-four law schools in all have rates in excess of twenty percent, another twenty have rates of fifteen percent or higher, and a large group of schools (thirty-three in all) have rates in excess of ten percent. These numbers are astounding given the college performances of the students these law schools admit; what's particularly telling is that the above list of nearly 80 schools includes more than fifteen law schools ranked among US News' latest list of top-100 law schools.").

280. See *id.*

281. See *id.*

282. Fruehwald, *supra* note 278, at 100.

performance.²⁸³ Therefore, a key aspect of encouraging students to become self-regulated learners is to foster an environment in which self-regulated learning may flourish, despite the impact of the curve.²⁸⁴ Creating this environment has been described succinctly as “subverting the curve.”²⁸⁵

In recent years, a growing number of scholars in legal academia have called for more intentional inclusion of the concepts of metacognition, self-regulated learning, and mindset in the law school curriculum in order to foster the best learning outcomes for students, and a disproportionate number of these scholars are involved in skills-based teaching in law schools, including legal writing professors and those involved with academic success programs.²⁸⁶ The research into these areas has shown that teaching students explicitly about these concepts is key to helping students develop a growth mindset and in turn, self-regulated learning skills.²⁸⁷ Thus, a number of scholars have called for direct teaching of these topics from the very beginning of law students’ academic careers, for instance, during orientation.²⁸⁸

However, if this teaching is not carried through the curriculum in a meaningful way beyond that initial instruction, as the discussion of massed and spaced practice above suggests, it will be quickly forgotten and not result in deep learning, meaning the internalization of the concepts for long-term retention, especially in the competitive context created by law school grading.²⁸⁹ Therefore,

283. *See id.* at 100–01 (“The most important aspect of helping students develop self-efficacy is to show them that their intellectual abilities are changeable if they use the sufficient effort and proper methods (‘a growth mindset’), rather than unchangeable (‘a fixed mindset’). As noted above, students with growth mindsets generally succeed, while those with fixed mindsets usually fail and often develop ‘learned helplessness’—‘a stable pattern of attributing many events to uncontrollable causes.’ Similarly, having students focus on learning goals, rather than performance goals, helps students’ self-efficacy because, with learning goals, achievement is measured against past performance; thus, failure is less traumatic than when students have performance goals, such as getting a good grade or status.”).

284. *Id.*; Sheppard, *supra* note 128, at 192 (arguing that a mandatory grading curve hinders development of self-regulated learning because students see grades as “something that is done to the learner” rather than as “something to be done for oneself”).

285. Thank you to Amanda Garcia, a former faculty colleague, for coining this phrase.

286. *See, e.g.*, Niedwiecki, *supra* note 4, at 33 (Prof. Niedwiecki is an Assistant Professor of Law and Director of the Lawyering Skills and Values Program at the Shepard Broad Law Center of Nova Southeastern University); Fruehwald, *supra* note 278, at 100 (Prof. Fruehwald is a professor of Legal Writing, Hofstra University School of Law); Lawrence S. Krieger, *Psychological Insights: Why Our Students and Graduates Suffer, and What We Might Do About It*, 1 J. ASS’N LEGAL WRITING DIRECTORS 259 (2002) (Prof. Krieger is a clinical professor Florida State University College of Law); Bloom, *supra* note 134, at 338 (Prof. Bloom is an Associate Professor of Law & Director of the Academic Excellence Program, New England Law).

287. *See supra* Part III.A.

288. *See* Paula Lustbader, *You Are Not in Kansas Anymore: Orientation Programs Can Help Students Fly Over the Rainbow*, 47 WASHBURN L.J. 327, 328 (2008) (“These programs are a good start and send students down the road. Just as Dorothy needed more to help her along the way, however, law students also need additional assistance. Students need to reflect on their goals. They need context, care, a sense of community, and confidence. Moreover, they need a legal education that provides coherence to the law school experience and facilitates their professional formation”).

289. *See supra* Part II.C.

scholars have likewise set out suggestions for incorporating these concepts into the curriculum throughout the academic year.

One focus has been on fostering student engagement in the learning process, discussing ways in which students can be guided to monitor their own progress as they are engaged in a learning activity and to reflect at the end of a learning activity in order to complete the learning cycle.²⁹⁰ For example, in his article *Lawyers and Learning, A Metacognitive Approach to Legal Education*, Professor Anthony Niedwiecki suggests professors envision themselves as a “coach in the regulation of learning” for their students, teaching students skills to direct and monitor their own learning.²⁹¹ Professor Niedwiecki also posits that technology can be a powerful way to foster students’ monitoring of their own learning and reflection during the learning process, suggesting students take part in “learning blogs” and message boards created by the professor regarding a topic being taught, and that students use the comment function in Microsoft word to communicate comments about their own writing to the professor on drafts of assignments.²⁹² Finally, professor Niedwiecki suggests that professor-created on-line quizzes can help students monitor their own progress on a given topic.²⁹³ All of these suggestions may be employed in the legal writing classroom to guide students through the cycle of self-regulated learning and in turn, internalize those skills for use beyond the classroom.

Another focus has been on the way in which professors give feedback to students.²⁹⁴ As Dweck’s research shows, the form of feedback can have profound effects on the development of a growth or fixed mindset.²⁹⁵ Based in part on this research, some scholars have suggested specific guidelines for giving formative feedback to students, that is, feedback that is geared toward helping a student improve, as opposed to summative feedback, which is geared toward evaluating a student’s performance. In her article *Teaching Law Students to Teach Themselves: Using Lessons from Educational Psychology to Shape Self-Regulated Learners*, Professor Elizabeth Bloom explains:

To maximize learning, active learning opportunities must be linked with effective formative feedback. Educational psychologist Marilla Svinicki sets out four specific teaching tools to link formative feedback to self-regulated learning: (1) setting out clear criteria for performance, (2) encouraging self-assessment through activities requiring students to evaluate their own

290. Niedwiecki, *supra* note 4, at 33.

291. *Id.* at 35.

292. *Id.* at 65–67.

293. *Id.* at 68.

294. See Bloom, *supra* note 134, at 340.

295. See DWECK, MINDSET, *supra* note 142, at 6-7, 32.

performance, (3) providing diagnostic information about student performance, and (4) providing opportunities to practice and improve.²⁹⁶

Applying these aspects of feedback to the legal writing classroom, the guided use of rubrics for writing assignments as well as the opportunity to receive feedback on drafts and then revise the assignment are key aspects to meeting these criteria for successful formative feedback.

A focus on metacognition, self-regulated learning, and mindset is also helpful for combatting the problem of stereotype threat in legal education.²⁹⁷ In one study regarding under-performance by underrepresented students in law school, the researcher found that incoming markers of academic readiness such as LSAT score and undergraduate GPAs did not explain the gap in law school grades between White and Black students and concluded that “law school culture significantly affects minority student achievement.”²⁹⁸ Stereotype threat is considered by many researchers to be a part of the reason for this performance gap.²⁹⁹ Interventions that convey the concept that intelligence is malleable, including both explicit teaching of this concept as well as curricular interventions such as critical evaluations that focus on clear expectations and formative feedback, have been shown to be a helpful part of combatting the effects of stereotype threat.³⁰⁰

The most recent interest in the general arena of learning from failure focuses on the importance of “grit,” one of the character traits Paul Tough discusses in his book, *How Children Succeed*, that is closely linked to Dweck’s Mindset Theory and has become the subject of Angela Duckworth’s research. The concept of grit has recently gained the attention of legal scholars and practitioners alike interested in what makes for a successful attorney.³⁰¹ Although the research into this area is nascent, Duckworth and Dweck’s findings about the interrelation of mindset and grit, specifically that having a growth mindset makes one grittier—that is, more willing to stay the course in the face of adversity—and that, in turn, grit helps sustain a growth mindset over time, leading one to stick with and

296. Bloom, *supra* note 134, at 340.

297. See Sean Darling-Hammond & Kristen Holmquist, *Creating Wise Classrooms to Empower Diverse Law Students: Lessons in Pedagogy from Transformative Law Professors*, 25 BERKELEY LA RAZA L. REV., 18 (2015); Erman & Walton, *supra* note 180, at 331–32.

298. Darling-Hammond, *supra* note 297, at 14–15.

299. *Id.*

300. Darling-Hammond, *supra* note 297, at 18; Erman & Walton, *supra* note 180, at 331–32.

301. See *The Grit Project: True Grit and a Growth Mindset*, ABA, http://www.americanbar.org/groups/women/initiatives_awards/grit.html [<http://perma.cc/7U3G-YDW8>] (last visited Oct. 23, 2015); Martha Middleton, *True Grit: A New ABA Project Helps Women Learn Personal Characteristics That Will Help Them Advance in the Legal Profession*, 100 A.B.A. J. 62, 62–63 (explaining the ABA Commission on Women in the Profession’s new project related to growth mindset and grit); Jennifer Ator, *No Guts, No Glory*, 39 L. PRAC. 58, 58 (2013); Cory M. Lenx, *Building Grit, Tenacity, and Perseverance While Teaching Legal Research*, CHARLOTTE LAW BLOG (Oct. 16, 2014), <http://charlotteschooloflawblog.com/2014/10/16/building-grit-tenacity-and-perseverance-while-teaching-legal-research/> [<http://perma.cc/EZH3-G787>].

achieve arduous goals, has slowly found its way into legal circles.³⁰² The ABA Commission on Women in the Profession has launched The Grit Project, an endeavor that seeks to “educate[] women lawyers about the science behind grit and growth mindset—two important traits that many successful women lawyers have in common.”³⁰³ The Grit Project’s goal is to “provid[e] the tools to assess and learn these traits” thereby “enhanc[ing] the effectiveness as well as the retention and promotion of women lawyers.”³⁰⁴

Although law schools are generally not yet teaching grit explicitly, there has been some interest emerging in doing precisely that, especially given scholars’ conclusions that “grit, tenacity, and perseverance can be teachable and transferable competencies.”³⁰⁵ For example, at the American Association of Law Librarians Annual 2015 Meeting and Conference, Kristina Niedringhaus and Carolyn Broering-Jacobs presented on “Building Grit, Tenacity, and Perseverance While Teaching Legal Research,” generating interest in the concept of teaching skills such as “grit” as best practice in the law school setting.³⁰⁶

Research into grit by Duckworth and others has led to an important observation about grit’s relation to interest, or in Tough’s list of key character traits, curiosity. Duckworth has observed that “we also need to find and help [students] cultivate their passions. That’s as much a part of the equation here as the hard work and persistence.”³⁰⁷ In other words, students are much more willing and able to demonstrate grit in pursuit of a goal, when they are passionate about their goal.

Another movement in legal academia that has a relationship to the concept of developing interest, curiosity, and passion in law students is the Humanizing Law School Movement, spearheaded by Professor Lawrence Krieger. The Humanizing Law School Movement grew out of Krieger’s observation that lawyers are disproportionately unhappy and unbalanced people and that the source of this dissatisfaction begins in law school.³⁰⁸ Statistics amply back up this observation. In one study by Dr. Andrew Benjamin, about forty percent of law students were

302. See *The Grit Project: True Grit and a Growth Mindset*, ABA, http://www.americanbar.org/groups/women/initiatives_awards/grit.html [<http://perma.cc/7U3G-YDW8>] (last visited Oct. 23, 2015); Middleton, *supra* note 301, at 62–63 (explaining the ABA Commission on Women in the Profession’s new project related to growth mindset and grit); Jennifer Ator, *No Guts, No Glory*, 39 *LAW PRAC.* 58, 58 (2013); Lenz, *supra* note 301.

303. Middleton, *supra* note 301, at 62–3.

304. *Id.*

305. Jain, *supra* note 220, at 46–48.

306. Lenz, *supra* note 301 (noting the positive reaction to Kristina Niedringhaus and Carolyn Broering-Jacobs presentation Building Grit, Tenacity, and Perseverance While Teaching Legal Research, which was made at the American Association of Law Librarians Annual 2015 Meeting & Conference). Middleton, *supra* note 301, at 63 (noting that as a result of the ABA Commission on Women in the Profession’s project that a number of law schools have expressed some interest in teaching growth mindset and grit).

307. Smith, *supra* note 219.

308. Melissa H. Weresh, *I’ll Start Walking Your Way, You Start Walking Mine: Sociological Perspectives on Professional Identity Development and Influence of Generational Differences*, 61 *S.C. L. REV.* 337, 374 (2009).

clinically depressed by graduation, whereas before law school, the students were no more depressed than the general population, where about eight percent are depressed.³⁰⁹ Another study found that “the emotional distress of law students appears to significantly exceed that of medical students and at times to approach that of psychiatric populations.”³¹⁰ This trend continues in law practice. Other studies indicate that lawyers “have the highest incidence of depression of any occupation in the United States” and “suffer other forms of emotional distress up to 15 times more frequently than the general population.”³¹¹

The Humanizing Law School Movement ties this psychological distress in law students to a culture in law school that de-humanizes law students, in part, by creating an environment in which law students become motivated by external values such as image and appearance rather than intrinsic motivations that lead to personal growth and satisfaction. In its early development, the Humanizing Law School Movement used the work of psychologist Abraham Maslow to help describe this lack of what Maslow would term a “growth motivation”:

Maslow delineated “lower” and “higher” human needs, and observed that motivation toward the different levels of need produces markedly different levels of life satisfaction. The lower needs include survival, security, belonging, competence, and respect from others. People focused mainly on any of these needs experience “deficiency motivation”—a strong drive to fulfill these basic needs that is accompanied by minimal life satisfaction. The experience is one of effort punctuated by “moments of episodic relief.” By contrast, people pursuing primarily the higher needs for self-esteem and self-actualization experience “growth motivation,” in which they are seeking the highest levels of personal development and self-expression. This quality of motivation provides an entirely different life experience, marked by persistent satisfaction and fulfillment. Maslow found such people to be peaceful, unworried, accepting, and to experience a constant sense of gratitude, satisfaction, “overflowing abundance” and fresh appreciation for life. Their lives are also enriched by exceptional levels of fun, joy, and love.³¹²

The later development of the Humanizing Law School Movement draws upon a related psychological theory termed self-determination theory (“SDT”) that is more rigorously empirical. SDT focuses on three experiences—competence,

309. Debra Cassens Weiss, *'You are not alone': Law Prof Who Considered Suicide Tells His Story*, A.B.A. J. (Apr. 8, 2014), www.abajournal.com/news/article/you_are_not_alone_law_prof_who_considered_suicide_tells_his_story/ [http://perma.cc/R884-87RV].

310. Kennon M. Sheldon & Lawrence S. Krieger, *Understanding the Negative Effects of Legal Education on Law Students: A Longitudinal Test of Self-Determination Theory*, 33 PERSONALITY & SOC. PSYCHOL. BULL. 883, 883–84 (2007).

311. Lawrence S. Krieger, *The Inseparability of Professionalism and Personal Satisfaction: Perspectives on Values, Integrity and Happiness*, 11 CLINICAL L. REV. 425, 427 (2005).

312. *Id.* at 428.

autonomy, and relatedness—that all human beings need to thrive.³¹³ The theory holds that,

people need to feel that they are good at what they do or at least can become good at it (competence); that they are doing what they choose and want to be doing, that is, what they enjoy or at least believe in (autonomy); and that they are relating meaningfully to others in the process, that is, connecting with the selves of other people (relatedness).³¹⁴

Law school, the Humanizing Law School Movement holds, does not fully support, and even subverts, these three key components to personal growth and satisfaction. Teaching explicitly about metacognition, mindset, and self-regulated learning as well as using these concepts to structure law school curriculum are some ways in which commentators have suggested helping to create an environment in law school where competence, autonomy, and relatedness can be fostered in law students.³¹⁵ Although there has yet to be an exploration of how structures in legal education that foster personal growth and passion on the part of our students in turn may foster grit in students, given the recent interest in this area by legal practitioners and scholars, it is ripe for exploration.

CONCLUSION

The legal academy and practitioners alike have come to understand the need for law schools to produce “practice-ready” attorneys. Law schools have heeded this call, including an ever increasing focus on skills-based classes. It is time, however, to focus not just on the inclusion of such classes in the curriculum, but also the best methods and practices used within those classes to create learning for long-term retention and deep understanding. Legal writing, most students’ first skills-based class, offers an appropriate starting place for this inquiry.

Professors Roediger and McDaniel’s work offers the legal academy an opportunity to take a broad view of the current status of cognitive science with regard to learning for long-term retention and deep understanding. Four points made by Professors Roediger and McDaniel are particularly applicable to the legal education setting: (1) making learning difficult for students is often optimal, (2) determining and teaching to students’ learning styles may not be important, (3) practice that is focused and repetitive is not ideal, and (4) students’ reactions to failure can have a profound effect on their skill acquisition. Examining each of these points in depth suggest that several scholars have put forth excellent ideas that fall in line with the current understandings of cognitive science, and their ideas should be heeded, tested and expanded upon. In other areas, especially the

313. Sheldon & Krieger, *supra* note 310, at 885.

314. *Id.*

315. See Bloom, *supra* note 134, at 340; Niedwiecki, *supra* note 4, at 35; Fruehwald, *supra* note 278, at 100.

area of spaced, interleaved, and varied practice, the scholarship is lacking and it is time to start thinking about how to best “practice” in the legal writing classroom. Professors Roediger and McDaniel’s work offers a beginning, not an end, to the conversation about how best to make law students legal education “stick.”