ARTICLES

A Primer on Learning Styles: Reaching Every Student

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The days of *The Paper Chase*[1] are over, or so the law schools at Harvard and other universities announce.[2] But, are they? In *The Paper Chase*, Professor Kingsfield teaches Contracts to a class of approximately 150 first-year students at Harvard. He is the master of his classroom: He wields the Socratic method like an intellectual sword, intimidating, if not terrorizing, many of his students in the process. He berates students for not speaking up or for not being prepared. He evaluates students on a single exam at the end of the course. Then, at the end of the year, he still does not know his students' names.

So what has changed? Law school classes may be smaller and the professor less rude or remote, but the instruction and method of evaluation generally remain the same. Brooks, the student with a pho-

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1. THE PAPER CHASE (Twentieth Century Fox 1973) (a movie and subsequent television series, depicting the first year of law school at Harvard).

2. *See, e.g.*, Seth Stern, *Harvard Law Changes the Pace of Its Paper Chase*, CHRISTIAN SCI. MONITOR, Oct. 24, 2000, at 13, *available at* http://www.csmonitor.com/durable/2000/10/24/ fp13s1-csm.shtml (announcing the creation of seven law colleges in the first-year class of Harvard Law School to shrink the size of sections from 140 to 78 students and to improve faculty-student interaction); Vermont Law School, *at* http://law.vermontlaw.edu/orientation/ asp/director.htm (last visited Aug. 11, 2001) (announcing that the "days of Professor Kingsfield of *The Paper Chase* infamy are over"); Tony Mauro, *Online Law School Challenges Precedents*, USA TODAY, Oct. 12, 1999 (distinguishing Concord University School of Law from *The Paper Chase* because, as an all-internet law school, it has no ivy-covered buildings, looming law professors, or quaking students), *at* http://www.usatoday.com/life/cyber/tech/ctg403.htm; University of Louisville Louis D. Brandeis School of Law, *at* http://www.louisville.edu/brandeislaw/ welcome/brandeis_facts.htm (last visited Aug. 11, 2001) (espousing a law school culture based on civility and respect for all students and faculty, avoiding "paper chase" or "cutthroat" law school stereotypes).

tographic memory, still would claim to not have what it takes to suc-
ceed because of his inability to analyze the data. Bell, the student with
a 190 I.Q. who was fifth generation Harvard, still would generate an
800-page course outline ("better than the book") because he did not
know what the focus of the course or his analysis should be. Finally,
O'Connell still would be overwhelmed by the volume of work, unable
to keep up. These students, all very bright, would flounder in today's
law school just as they did in *The Paper Chase* because their habitual
ways of learning do not correspond with law school's way of teaching
and these students do not know how to adapt.

In addition, the law student population has changed both in the
way the students have been learning and in their make-up. First, no
longer do all of the students enter law school because of their mastery
of books. Grade school rooms have tables, not desks, and no one is
sitting very still. High school English classes teach Shakespeare by
showing a movie. University classes grade group, not individual, pro-
jects. And at every level of education, the rooms are filled with com-
puters, alive with color and motion, beeps and clicks. Yet when these
students reach law school, professors too often expect them to sit still,
work alone, and learn either through written materials or in the class-
room hot seat. Professors are too often disappointed when they do
not.

Second, law students are far more diverse than in previous gen-
erations.[3] This diversity in ethnicity and gender also represents diver-
sity in thought.[4] As a result of these changes, law teaching must nec-

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3. In academic year 1971-72, the law student population was 91% male, 9% female, 94%
white, and 6% minority. In academic year 1999-2000, the law student population was 53% male,
47% female, 81% white, and 19% minority. In 28 years, female enrollment increased nearly 700%
and minority enrollment increased 450%. In addition, the representation of minorities has
changed. In 1971-72, African Americans represented 67% of all minorities in law school, Native
Americans were less than 3%, Asian American/Pacific Islanders were less than 9%, Mexican
Americans were 16%, Puerto Ricans (excluding Puerto Rican law schools) were less than 2%, and
other Hispanics were 3%. In 1999-2000, African Americans were only 37% of all minorities in
law school, Native Americans were 4%, Asian American/Pacific Islanders were 31%, Mexican
Americans were 10%, Puerto Ricans (excluding Puerto Rican law schools) were less than 3%, and
other Hispanics were 16% (exceeds 100% due to rounding). Percentages Derived from American
Bar Association Data, *at* http://www.abanet.org/legaled/statistics/stats.html (last visited June
30, 2000).

4. Generally, white females, African-Americans, Native Americans, and Hispanic Ameri-
cans tend to process information, solve problems, and think in diverse ways from European
American and Asian American males. James A. Anderson & Maurianne Adams, *Acknowledging
the Learning Styles of Diverse Student Populations: Implications for Instructional Design*, *in*
TEACHING FOR DIVERSITY 21-23 (Laura L.B. Border & Nancy Van Note Chism eds., 1992).

    For example, Native American students appear . . . to be more skilled in performing
    tasks than in verbal expression, more visual than auditory linguistic, more oriented
    toward observation or imitation than toward verbal instruction, and more comfortable
    with spatial than with sequential activities and with group, peer, or cross-age learning

essarily change as well—but how? For all law professors, whether new or experienced, knowing something about learning styles will enhance the professors' teaching and their students' ability to master the material. Many authors and researchers have written extensively about learning styles, but the literature can be daunting to the uninitiated.[5] A plethora of articles exists, and they all seem to be discussing different things. How do professors compare them? How can professors evaluate what is helpful and what is not? How does the information apply to teaching law? If students have unique learning styles, how do professors teach to a class of 100 students?

This article establishes a framework that will put the literature into perspective, will allow professors to evaluate what is meant by "learning style," and will give them guidance for how to be more effective teachers both in the classroom and out. Part I discusses how knowledge of learning styles will help professors achieve their pedagogical goals. Part II discusses the personal characteristics that contribute to learning style. Finally, Part III applies the learning styles to the learning cycle and discusses how professors can most effectively help their students grow.

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projects than with individual question-and-answer sessions. Chicano socialization endorses cooperative interactions oriented toward helping others rather than individualistic competition. African-American students often communicate through peer relationships that support group learning or group (but not individual) competitions, simulations, and role plays. . . . [R]esearch on female college student . . . found typical and recurrent differences from the white, male norm in their female subjects: affiliation rather than separation, an identity oriented toward relationships rather than toward autonomy, and a preference for collaborative or cooperative interaction rather than competitive achievement.

Id. at 21–22 (citations omitted). *See, e.g.,* Yvonne R. Bell, *A Culturally Sensitive Analysis of Black Learning Style,* 20 J. BLACK PSYCHOL. 47, 47–61 (1994); *see also, e.g.,* JANICE E. HALE-BENSON, BLACK CHILDREN: THEIR ROOTS, CULTURE, AND LEARNING STYLES (1986); Grace C. Cooper, *Black Language and Holistic Cognitive Style,* 5 W.J. BLACK STUD. 201 (1981); Manuel R. Ramirez III & Douglass R. Price-Williams, *Cognitive Style of Three Ethnic Groups in the United States,* 5 J. CROSS-CULTURAL PSYCHOL. 212, 212–217 (1974); Charles G. Moore, *The Implication of String Figures for American Indian Mathematics Education,* 28 J. AM. INDIAN EDUC. 16, 16–26 (1988); Gerry D. Haukoos & Robert Satterfield, *Learning Styles of Minority Students (Native Americans) and Their Application in Developing a Culturally Sensitive Science Classroom,* 10 COMMUNITY/JUNIOR C. 193, 193–201 (1986); ELISABETH HAYES & DANIELE D. FLANNERY, WOMEN AS LEARNERS: THE SIGNIFICANCE OF GENDER IN ADULT LEARNING (2000).

5. Even to the initiated, the literature can be confusing. Authors mean different things when they use the term "learning styles" and no unified theory exists. SHARAN B. MERRIAM & ROSEMARY S. CAFFARELLA, LEARNING IN ADULTHOOD: A COMPREHENSIVE GUIDE 209 (2000).

I. KNOWLEDGE OF LAW STUDENTS' LEARNING STYLES WILL HELP PROFESSORS ACHIEVE PEDAGOGICAL GOALS

Why should professors be concerned with learning styles? Simply stated, when teachers teach in ways that acknowledge and validate different styles of learning, students do better. No common definition of learning style exists, but generally, learning styles are those cognitive, affective, and psychological behaviors that indicate how learners interact with and respond to the learning environment and how they perceive, process, store, and recall what they are attempting to learn.[6] By applying some basic concepts of learning styles in the classroom, professors can improve student retention of information, help students develop more efficient and effective study methods, increase student self-awareness of how students learn best, and help move students to a higher or more evolved level of thinking. Most important, professors can improve student success in law school.

For teachers of law, the primary goal is to help law students master the doctrinal or substantive material of their law courses and apply that information using various legal skills such as legal analysis or advocacy. Law professors assess whether students have mastered the material, usually through an examination or paper, and assign them a grade. However, not all students do equally well. This inequality is a concern because the students may not have another opportunity to master the material, which they will need to pass the bar and to adequately represent their clients. Professors can help their students achieve their full potentials by teaching to the diverse learning styles in the classroom.

Teaching to diverse learning styles helps students in two significant ways. First, students will be more successful in mastering their coursework if they are better able to absorb, process, and retain information. Second, students will be more successful in mastering their coursework if they learn how they learn best. When students learn how they learn best, they engage in metacognition. Metacognition involves knowing how one learns and what results one achieves from different learning processes; it involves self-regulation of cognitive activities through monitoring and making appropriate adjustments.[7]

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6. *See* J.W. KEEFE, STUDENT LEARNING STYLES: DIAGNOSING AND PRESCRIBING PROGRAMS 4 (1979). Alternatively stated, learning styles are "the complex manner in which, and conditions under which, learners most efficiently and most effectively perceive, process, store[,] and recall what they are attempting to learn." Waynne B. James & William E. Blank, *Review and Critique of Available Learning-Style Instructors for Adults, in* APPLYING COGNITIVE LEARNING THEORY TO ADULT LEARNING 47–48 (Daniele D. Flannery ed., 1993).

7. Paul T. Wangerin, *Learning Strategies for Law Students,* 52 ALB. L. REV. 471, 474–77 (1988). *See* Catherine A. Stouch, *What Instructors Need to Know About Learning How to Learn,*

When professors teach to diverse learning styles, students will become aware of different learning processes and can assess which ones work best for them in given situations. Most significantly, students may discover that their traditional methods of studying are not adequate to achieve analytical competence.

Teaching to diverse styles will also move law students to a higher, more evolved level of thinking because the students can adjust their cognitive activity to the desired outcome. Professors know something that beginning law students do not: one cannot do well in law school solely by memorizing. While professors may know this intuitively, they may not know why this is true. The answer comes from the education psychology literature: memorization will not generate the desired outcomes of synthesis, application, and analysis. These are different levels of learning, and what is required to achieve each level is different.[8] While different schemata of the levels of learning exist,[9] most are derivative of Bloom's *Taxonomy of Educational Objectives*.[10] For our purposes, we can simplify the taxonomy to three manageable levels: knowledge, comprehension and sorting, and analysis.

For law students to master analysis, law professors must teach in a way that guides students from the simplest level of learning, knowledge based on memorization, to the most complex level of learning, analysis. Law students are comfortable with the former, but inexperienced with the latter.[11] Whether law students are achieving the higher

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in APPLYING COGNITIVE LEARNING THEORY TO ADULT LEARNING 59–60 (Daniele D. Flannery ed., 1993) (identifying three components to learning how to learn: knowledge about learning, knowledge about learning style, and skills to improve proficiency).

8. See A COMMITTEE OF COLLEGE AND UNIVERSITY EXAMINERS, TAXONOMY OF EDUCATIONAL OBJECTIVES: THE CLASSIFICATION OF EDUCATIONAL GOALS, HANDBOOK I: COGNITIVE DOMAIN 62 (Benjamin S. Bloom ed., 1956) [hereinafter Bloom].

9. While scholars might characterize the levels somewhat differently, they generally follow the same pattern. *E.g.*, John W. Thomas & William D. Rohwer, *Academic Studying: The Role of Learning Strategies*, 21 EDUC. PSYCHOLOGIST 19, 22 (1986) (three kinds of informational products exist: verbatim, interpreted, and constructed knowledge).

10. Bloom, *supra* note 9. In Bloom's taxonomy, the first level of learning is knowledge. Knowledge is derived from memorization. *Id.* at 62–88. The next levels of learning, in ascending order, are (a) comprehension, including translation, interpretation, and extrapolation; (b) application; (c) analysis, including elements, relationships, and organizational principles; (d) synthesis; and (e) evaluation. *Id.* at 89–197. For our purposes, we can simplify these levels somewhat. The last four levels are integral aspects of legal analysis: the need to synthesize the law from binding authorities to create an analytical framework, to apply it, and to evaluate the strengths and weaknesses of that application. Therefore, we can combine them, leaving us with a more manageable three levels.

11. *See* Michael L. Richmond, *Teaching Law to Passive Learners: The Contemporary Dilemma of Legal Education*, 26 CUMB. L. REV. 943, 955–56 (1995-96) (discussing how pre-law education promotes rote memorization in contrast to law education, which promotes independent thinking and advanced problem-solving, and noting that students suffer significant culture shock in law school when introduced to its active learning environment); JOSEPH D. NOVAK,

levels of learning required for studying law is evidenced through their levels of understanding.[12]   Students reach a high level of understanding when they can apply information, detail the analysis, and conclude.[13]   A lesser level of understanding occurs when students can apply information and come to conclusions, but with no detail in the analysis.[14]   Below that, a second lesser level of understanding occurs when students' work is descriptive, although detailed.   Finally, the lowest level of understanding occurs when students' work is descriptive, but without detail.[15]   To illustrate these categories in the context of studying law:

	Detail	No detail
Analysis	#1: Deep level of understanding illustrated by a strong analytical framework and reasoning by analogy that includes detailed discussion of authorities and facts	#2: Deep level of understanding illustrated by a strong analytical framework, but reasoning by analogy lacks detail and is more conclusory
Description	#3: Surface level of understanding illustrated by detailed description of authorities but without a clear analytical purpose	#4: Surface level of understanding illustrated by description of authorities but without detail or clear analytical purpose

Students whose work is descriptive have a low level of understanding, relying solely on memorization.   To achieve a deeper or higher level of understanding, more than memorization is necessary. Achieving a deeper understanding requires active learning, i.e., questioning and relating, rather than passive learning, i.e., neutral absorp-

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LEARNING, CREATING, AND USING KNOWLEDGE 20, 69–70 (1998) (noting that most school learning involves rote learning, illustrated by verbatim acquisition of new knowledge, and most college and secondary students resist moving beyond memorization to more meaningful learning, preferring instead to get by on memorization). Descriptive intelligence may result in good grades in earlier education experiences, *see, e.g.,* Jack E. Robinson & Jerry L. Gray, *Cognitive Style as a Variable in School Learning,* 66 J. EDUC. PSYCHOL. 793, 794, 798 (1974) (a descriptive cognitive style was the most important contributor to school learning for fifth graders), but it is not the intelligence for success in graduate programs like law school, ROBERT J. STERNBERG, THE TRIARCHIC MIND: A NEW THEORY OF INTELLIGENCE 55–57 (1989) (practical intelligence is needed as well).

   12. NOEL ENTWISTLE, STYLES OF LEARNING AND TEACHING: AN INTEGRATED OUTLINE OF EDUCATIONAL PSYCHOLOGY FOR STUDENTS, TEACHERS, AND LECTURERS 76–77 (1981).
   13. *See id.*
   14. *Id.*
   15. *Id.*

tion.[16]   Unfortunately, many law students have achieved academic success prior to law school primarily through memorization.[17]   Now, those memorization skills will be sorely challenged: (1) because those memorization skills may not be sufficient to handle the substantial increase in information that the students must master; and (2) because those memorization skills are inadequate to move the students to the higher level of learning needed for success in law school.   Professors can help ameliorate the dissonance between what led to academic success before law school and what leads to academic success in law school by helping their students learn how to learn effectively.   By understanding different learning styles, professors can help students master the critical thinking that will lead the students both to a deeper understanding of the material and to the analytical learning necessary to succeed in the study of law.
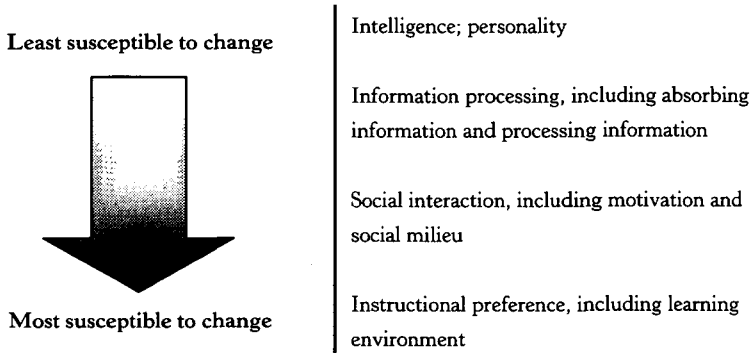
II. PERSONAL CHARACTERISTICS THAT CONTRIBUTE TO STUDENTS' LEARNING STYLES

Different personal characteristics contribute to students' learning styles.   For example, learning styles might be reflected in organizing material in logical steps, preferring lectures over writing, or taking notes on a yellow pad.   However, these are not comparable things. This section will discuss the personal characteristics that contribute to learning style, placing them in a hierarchy that can help professors determine what they can accommodate in their teaching, and what students can address in their learning

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16.   Deeper understanding requires greater mental effort. Gavriel Salomon, *The Differential Investment of Mental Effort in Learning from Different Sources*, 18 EDUC. PSYCHOLOGIST 42, 43 (1983).   Understanding occurs the more that the learner mentally elaborates on the material; the more contact with other mental schemata that the learner has, the more memory traces and enriched meanings the learner creates. *Id.* at 44.   Active learning helps the learner to mentally elaborate on material. *See* ENTWISTLE, *supra* note 12, at 77.   Active readers determine what arguments the author is making and question what they are reading by interpreting and prioritizing the author's points, evaluating the adequacy or inadequacy of support for arguments, and connecting what they are reading to their personal experiences. *Id.* at 77–78.   In contrast, passive readers look for the general point, skip over the details, do not prioritize the information, and may have problems concentrating on what the author is saying. *Id.* at 78.   Resources available on active reading include CRAIG K. MAYFIELD, READING SKILLS FOR LAW STUDENTS 11 (1980), which recommends the SQ3R system developed by Francis P. Robinson in FRANCIS P. ROBINSON, EFFECTIVE STUDY 15–40 (4th ed. 1970).   In this system, the reader surveys the material by reading the chapter title, introductory paragraphs, headings, and summary (if any); questions the material by asking who, what, when, where, why, and how; reads to answer the questions; records brief answers to the questions, recites the answers from memory; repeats this process for each part of the reading; and reviews the reading by reciting all answers from memory. MAYFIELD, *supra*, at 11–12.

17.   For example, students rely on memorization when they cram for exams or when they take multiple-choice or essay exams that ask students to recall information or describe events.

Learning styles are affected by a number of characteristics, including a person's intelligence, personality, information processing mechanisms, social interaction needs, and instructional preferences.[18] As this diagram indicates, these characteristics are not equally susceptible to change:

Least susceptible to change

Most susceptible to change

Intelligence; personality

Information processing, including absorbing information and processing information

Social interaction, including motivation and social milieu

Instructional preference, including learning environment

The personal characteristics least subject to change are intelligence and personality.[19] The personal characteristics more subject to change are, in descending order, information processing, social interaction, and instructional preference.[20] The following sections will describe each personal characteristic in order from the least susceptible to the most susceptible to change.

A. Intelligence

The first personal characteristic affecting learning style is the type of intelligence.[21] Since intelligence is relatively fixed,[22] informa-

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18. CHARLES CLAXTON & PATRICIA MURRELL, LEARNING STYLES: IMPLICATIONS FOR IMPROVING EDUCATIONAL PROCESSES 7 (1987) (citing Lynn Curry, An Organization of Learning Styles Theory and Constructs, Paper Presented at the Annual Meeting of the American Educational Research Association (Apr. 11-15, 1983), at 3–4 (ERIC Document Reproduction Service No. ED 235 185)).

19. CLAXTON & MURRELL, *supra* note 19; H. J. EYSENCK, KNOWING YOUR OWN I.Q. 17–19 (1962) (discussing the permanency of I.Q.); CARL G. JUNG, PSYCHOLOGICAL TYPES 330–32 (1971) (originally published in 1923) (personality attitudes of introversion and extroversion and personality functions of perceiving and judging are biologically determined).

20. CLAXTON & MURRELL, *supra* note19.

21. In addition to assuring that a person has an adequate capacity to learn the material, intelligence contributes to learning style in two ways: (1) the type of intelligence may affect a person's learning style, and (2) a learning disability or problem in the wiring of the brain may affect a person's learning style. This article will discuss the former but not the latter except to the extent that the learning disabilities are reflected in preferences for absorbing and processing information. Nonetheless, learning disabilities substantially affect the manner in which the person with the disability can learn. Recent studies of the brain indicate that the brain wires itself from

tion about intelligence's contribution to learning style will help professors learn what tools they can use to compensate for or accommodate intelligence, rather than how to improve it.

Traditionally, intelligence in this country has been measured by mathematical/logical and linguistic skills.[23] However, Howard Gardner, professor of education at Harvard University, believes this view of intelligence is far too narrow, reflecting only those skills valued by post-industrial societies.[24] After studying prodigies, gifted individuals, brain-damaged patients, idiot savants, normal children and adults, experts in different lines of work, and individuals from cultures around the world,[25] Gardner concluded that eight different intelligences exist:[26] linguistic intelligence (words), logical-mathematical intelligence (chains of reasoning), musical intelligence (melody, rhythm, timbre), spatial intelligence (seeing from different angles, imagining movement, multi-dimensional thinking), bodily-kinesthetic intelligence (bodily motions, handling objects), interpersonal intelligence (knowing the feelings and intentions of others), intrapersonal intelligence (knowing yourself), and naturalist intelligence (distinguishing among, classifying, and using features of the environment).[27]

To the extent that these multiple intelligences are represented in law students, students can use these other forms of intelligence to

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the time of birth. RONALD KOTULAK, INSIDE THE BRAIN: REVOLUTIONARY DISCOVERIES OF HOW THE BRAIN WORKS 6–7 (1996). If a child is not exposed to certain stimulation, the brain will not be wired to process that stimulation efficiently, if at all. *Id.* at 16–17. Instead, the child must use other non-specific wiring to accomplish the task. *Id.* at 21–23, 29, 36; HOWARD GARDNER, FRAMES OF MIND 54 (1983) [hereinafter FRAMES OF MIND].

When the brain is sufficiently, although inefficiently, wired for the task, tools may exist to assist students, such as a spell checker or grammar checker. In addition, students with learning disabilities can learn by relying on other modes of absorbing information, *infra* notes 49–65, and by using organizational tools for visual learners, *infra* notes 56–61, and holistic processors, *infra* notes 95–98. Generally, learning disabilities are associated with problems in reading (e.g., dyslexia), concentration (e.g., attention deficit disorder), or organization (e.g., dyslexia, attention deficit disorder).

22. However, some believe that intelligence can be taught and improved. *See, e.g.,* ROBERT J. STERNBERG, INTELLIGENCE APPLIED: UNDERSTANDING AND INCREASING YOUR INTELLECTUAL SKILLS (1986).

23. FRAMES OF MIND, *supra* note 21, at 24. The most widely used intelligence tests are Wechsler Adult Intelligence Scale-Revised and the Primary Mental Abilities Test; both test heavily on verbal skills and, to a lesser extent, on mathematical skills and reasoning. MERRIAM & CAFFARELLA, *supra* note 5, at 171–72.

24. FRAMES OF MIND, *supra* note 21, at 24.

25. *Id.* at 9.

26. *Id.* at 73–276 (discussing seven intelligences); HOWARD GARDNER, INTELLIGENCE REFRAMED: MULTIPLE INTELLIGENCES FOR THE 21ST CENTURY 49, 59, 66, 68, 76 (1999) (adding an eighth intelligence, naturalist, but rejecting spiritual, existential, and moral intelligences).

27. *Id.* at 43–44, 49.

master legal analytical skills that students traditionally learn through linguistic or logical-mathematical intelligences. For example, a person with strong spatial intelligence can use diagrams to represent logical chains of reasoning. However, professors have no way of knowing their students' abilities in all of these intelligences since only two are tested routinely.[28] Nonetheless, professors can use this general knowledge of different intelligences to understand how their students may prefer to absorb information.

B. Personality

The second personal characteristic affecting learning style is personality. The leading theorist of personality is Carl Jung.[29] Jung observed patterns in human behavior that he categorized as "attitude-types" and "function-types."[30] "Attitude-types" describe personalities that direct interest either toward or away from external objects or events, i.e., extroversion and introversion.[31] "Function-types" describe the manner in which personalities direct their interest, i.e., sensation, intuition, thinking, and feeling.[32] While several personality assessments are well-recognized,[33] many law teachers have used the Myers-Briggs Type Indicator (MBTI), a personality assessment based on Jung's theory of psychological type, as a tool to help their students

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28. However, at least one educator has developed a measure of multiple intelligences. *See, e.g.*, Veronica Borruso Emig, *A Multiple Intelligences Survey*, 55 EDUC. LEADERSHIP 47 (1997).

29. JUNG, *supra* note 19.

30. *Id.* at 330.

31. Mary H. McCaulley, *The Myers-Briggs Type Indicator: A Jungian Model for Problem Solving*, in DEVELOPING CRITICAL THINKING AND PROBLEM-SOLVING ABILITIES 40 (James E. Stice ed., 1987).

32. JUNG, *supra* note 19, at 330, 436–37.

33. *E.g.*, KATHARINE C. BRIGGS & ISABEL B. MYERS, MYERS-BRIGGS TYPE INDICATOR (1976) (Jungian-based instrument that determines 16 personality types based on 4 bipolar scales: extroversion-introversion, sensing-intuition, thinking-feeling, judging-perception); ALLEN L. EDWARDS, EDWARDS PERSONAL PREFERENCE SCHEDULE (1959), *discussed in* 1 TEST CRITIQUES 252–58 (Daniel J. Keyser & Richard C. Sweetland eds., 1984) (widely used personality inventory that assesses 15 variables: Achievement, Deference, Order, Exhibition, Autonomy, Affiliation, Intraception, Succorance, Dominance, Abasement, Nurturance, Change, Endurance, Heterosexuality, Aggression); DAVID KEIRSEY & MARILYN BATES, PLEASE UNDERSTAND ME: CHARACTER AND TEMPERAMENT TYPES 30–66 (1984) (Jungian-based assessment of four temperaments: Dionysian, Epimethean, Promethean, and Apollonian); DON RICHARD RISO, DISCOVERING YOUR PERSONALITY TYPE: THE ENNEAGRAM QUESTIONNAIRE 5, 10–15 (1992) (instrument based on ancient understandings of personality; instrument determines nine personality types in three triads: Feeling Triad (Helper, Status Seeker, Artist), Doing Triad (Thinker, Loyalist, Generalist), Relating Triad (Leader, Peacemaker, Reformer)); JUNE SINGER & MARY LOOMIS, SINGER-LOOMIS TYPE DEPLOYMENT INVENTORY (1984) (Jungian-based personality inventory of Jung's eight basic personality types).

better understand how they learn.[34] Based on Carl Jung's theory of
psychological types,[35] the MBTI is a psychological instrument that as-
sesses preferences on four bi-polar scales,[36] creating sixteen personality
types, each with a four-letter designation.[37] Despite its use by some,
the MBTI may not be the best tool to use for assessing learning styles
in law school.[38]

   First, the MBTI was not developed to measure cognitive style.
Rather, it was developed to implement Jung's personality typology,[39]
so any contribution it may make to understanding cognitive style is
only indirect. While some of the items on the MBTI may concern
cognitive style,[40] others have no relevance.[41] This means that profes-
sors can only draw general conclusions about cognitive style from the
personality types. Second, the MBTI may not measure the aspects of
cognitive processing of most concern to law teachers: how the students
prefer to absorb information and how they process the information to
reach their end result.[42] Since personality styles are not ways of learn-
ing, only influences on learning,[43] what will be more useful is to assess
how personality style is reflected in the way that our students learn,
that is, how our students absorb and process information.

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   34. *E.g.*, Vernellia R. Randall, *The Myers-Briggs Type Indicator, First Year Law Students and Performance*, 26 CUMB. L. REV. 63 (1995).

   35. JUNG, *supra* note 19.

   36. Extroversion-Introversion, Sensing-Intuition, Thinking-Feeling, and Judgment-Perception. ISABEL BRIGGS MYERS & MARY H. McCAULLEY, MANUAL: A GUIDE TO THE DEVELOPMENT AND USE OF THE MYERS-BRIGGS TYPE INDICATOR 16–17 (2d ed. 1985) [hereinafter MANUAL].

   37. *Id.* For a more complete description of the Myers-Briggs Type Indicator ("MBTI"), see M.H. Sam Jacobson, *Using the Myers-Briggs Type Indicator to Assess Learning Style: Type or Stereotype?*, 33 WILLAMETTE L. REV. 261, 262–69 (1997). For a discussion of its limitations, see *id.* at 269–304.

   38. Jacobson, *supra* note 37, at 301. In addition, using the MBTI may have negative consequences because it contributes to stereotyping by grouping people into sixteen categories and assigning each category characteristics that individuals within the category may not have. For further discussion, see *id.* at 270–80.

   39. MANUAL, *supra* note 36, at 1; ROWAN BAYNE, THE MYERS-BRIGGS TYPE INDICATOR: A CRITICAL REVIEW AND PRACTICAL GUIDE 15–16 (1st ed. 1996). Bayne states the goals of the

   40. For example, item 21 asks: "Do you usually (A) value sentiment more than logic, or (B) logic more than sentiment?" David M. Schweiger, *Measuring Managerial Cognitive Styles: On the Logical Validity of the Myers-Briggs Type Indicator*, 13 J. BUS. RES. 315, 317 (1985) (quoting Form G of the MBTI).

   41. For example, item 67 asks the answerer to select between: (A) signsymbol (B) and item 54 asks the answerer to select between: (A) whowhat (B). *Id.*

   42. Jacobson, *supra* note 37, at 301–04 (MBTI does not measure how one absorbs information or cognitive processing).

   43. SHARON L. SILVERMAN & MARTHA E. CASAZZA, LEARNING AND DEVELOPMENT: MAKING CONNECTIONS TO ENHANCE TEACHING 45 (2000).

C. Information Processing

The third personal characteristic affecting learning style is how students absorb and process information.[44] Developmental learning theorists envision stages of cognitive development that occur as a child ages.[45] Experiential learning theorists build on that by extending the developmental stages into adulthood and including the effect that experience has on the learning process.[46] This concept of change in the learning process because of experience is validated by professors' own experiences of personal and professional growth. If the learning process is fluid, then professors can guide their students to improved learning. Professors can do that by considering how their students absorb information and how they process the information that they have absorbed.

1. Absorbing Information

How students absorb information is a significant aspect of learning style.[47] If students are not fully absorbing critical information, the most sophisticated processing of the information will not matter since it involves inadequate input. It would be like playing solitaire without a full deck. When comparing how professors expect students to absorb information with how students actually do absorb information, a significant dissonance may occur, which can dramatically affect performance.

People absorb information through their senses: sight, hearing, touch, taste, and smell. Sight allows a person to absorb information verbally, i.e., reading, or visually, i.e., through pictures or designs.

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44. How susceptible this characteristic is to change is a matter of some dispute. Generally, rationalist and other cognitive theories of learning, and behavioral learning theories view how someone absorbs and processes information to be fixed, just as intelligence and the wiring of the brain are fixed. *See* Jerre Levy, *Interhemispheric Collaboration: Singlemindedness in the Assymmetric Brain, in* HEMISPHERIC FUNCTION AND COLLABORATION IN THE CHILD 11–31 (Catherine T. Best ed., 1985); *see also* J.M. Levy, *Experiments on Attention and Memory, with Special Reference to the Psychology of Advertising,* 2 U. CAL. PUBLICATIONS PSYCHOL. 157, 195 (1916). However, developmental and experiential learning theorists view this characteristic as susceptible to change. *See* DAVID A. KOLB, EXPERIENTIAL LEARNING: EXPERIENCE AS THE SOURCE OF LEARNING AND DEVELOPMENT 3–15 (1984) (discussing how developmental and experiential learning theorists view learning as a process of change); *see also* WALTER B. BARBE ET AL., TEACHING THROUGH MODALITY STRENGTHS: CONCEPTS AND PRACTICES 3, 52–53 (1988) (rejecting modality as a fixed neurological characteristic and discussing the changes of modality preferences with age).

45. JOHN L. PHILLIPS, JR., THE ORIGINS OF INTELLECT: PIAGET'S THEORY 7 (1969) (giving an overview of Piaget's theory).

46. KOLB, *supra* note 44, at 1–38, 140–59.

47. Students' preferred learning mode may be the most significant aspect of their learning style. *See* William Wesley Patton, *Opening Students' Eyes: Visual Learning in the Socratic Classroom,* 15 LAW & PSYCHOL. REV. 1, 1 n.3 (1991).

Hearing allows a person to absorb information by listening to oneself speak (orally) or by hearing others speak (aurally). Touch allows a person to absorb information tactilely or kinesthetically. Taste and smell generally would not be significant modes of absorbing information in law school.[48]

While students use all of these modes for absorbing information, some students learn better when they absorb information in a particular way. A verbal learner is one who best absorbs information through reading or writing text. A visual learner is one who best absorbs information through pictures, diagrams, and other models of information rather than through written text. An oral learner is one who best absorbs information by talking out ideas. An aural learner is one who best absorbs information by listening, e.g., by using tapes or lectures. A tactile learner needs to be able to touch and manipulate. Finally, a kinesthetic learner needs to be able to move around or to see movement, e.g., motion of the instructor in the classroom.

a. Verbal Learners

Most law students are strong verbal learners who absorb information best through written text. In law school, information is primarily conveyed through written materials although the written materials are supplemented with classroom lecture or discussion. Because of law school's heavy reliance on written materials, students who learn more effectively by absorbing information through modes other than through reading may have difficulty.[49] While most students in law school are good verbal learners, many are not.

b. Visual Learners

A significant number of students are visual learners and that number appears to be increasing,[50] perhaps because of the early use of computers or because of early instruction designed to appeal to different intelligences.[51] Even more significantly, visual learners in law

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48. However, a scratch and sniff curriculum has not yet been tested.

49. Vernellia Randall, Director, Academic Excellence Program, University of Dayton School of Law, has long been involved in academic support. She believes that reading ability is the key predictor of law school success. E-mail from Vernellia Randall to <asp-l@chicagokent.kentlaw.edu>, Reading Comprehension Test (July 18, 1997) (on file with author).

50. When the first started teaching in 1989, less than 10% of her students were visual learners. Now, approximately 30% of her students are visual learners. The increasingly visual culture was also recognized by Diane Kirrane in *Visual Learning*, 46 TRAINING & DEV. 58 (1992).

51. Many elementary and secondary schools have incorporated Gardner's multiple intelligences into their classrooms. A sample of publications discussing the use of multiple intelligences in the classroom is available in the ERIC records. *Multiple Intelligences: Theory and Practice*

school may be disproportionately represented in the bottom of the class.[52]

Why would this occur? Visual learners tend to be right-brain, or holistic, thinkers rather than left-brain, or logical, thinkers.[53] This means that they absorb information in its entirety, rather than in parts. Visual learners have a picture of the information that they absorb. Visual learners might mentally scroll down to page five, paragraph three of the text to recall what was written. When visual learners prepare an outline, they do not remember the information in the outline because of doing the outline, but because they can mentally see what they wrote. Visual learners remember an idea, not because of the idea itself, but by where it appears on a page. They also remember what a professor said because of the professor's movements or visual aids.

While absorbing information verbatim may be good for memorizing and effective for description, it is problematic for legal analysis for several reasons. The information absorbed is not synthesized with other ideas, a skill needed to establish an analytical framework; it is not prioritized, a skill needed to eliminate the irrelevant; and it does not establish the connections between ideas, a skill needed to understand and critically evaluate the reasoning and logical support for the ideas.

To assist visual learners, professors can accommodate visual modes of absorbing information in their classrooms and in their one-on-one sessions with students without much difficulty.[54] In general, professors can select or prepare texts that present the material in a visually enhanced manner, e.g., with charts, diagrams, insets, shading or color, or if visually stimulating text is not available, professors can supplement the text with visually stimulating materials that illustrate the analytical concepts. In the classroom, professors can complement their presentations by making good use of the board by using color for

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in the K-12 Classroom, at http://www.indiana.edu/~eric_rec/ieo/bibs/multiple.html (last visited Aug. 11, 2001) (listing 45 citations from the ERIC Database and five other Web sites).

52. For example, nearly all of the students who fail Legal Research & Writing at Willamette University College of Law are visual learners. Of the fifty-two students since 1995 who were required to take a remedial summer Legal Research & Writing course, thirty-nine were visual learners, three were oral learners, five were oral/visual learners, and only five were verbal learners.

53. KOLB, *supra* note 44, at 46–50.

54. Visuals help all students retain information, not just those who are visual learners. Studies on memory indicate that learners remember pictures better than words or sentences. *See, e.g.*, Susumi Kobayashi, *Theoretical Issues Concerning Superiority of Pictures over Words and Sentences in Memory*, 63 PERCEPTUAL & MOTOR SKILLS 783, 783–792 (reviewing the results of studies and the four main theories for explaining this phenomenon).

lists or outlines to categorize or prioritize; using diagrams or other visual models to show the relationship between ideas; and using video, overheads, charts, or other visual tools. In addition, professors can encourage students to use visual tools like T-charts[55] to collect information in an analytically useful way so that relationships between ideas will be more clear.

In one-on-one sessions with students, these same visual aids would also help to illustrate the conversation even if simply drawn on notepaper.[56] To help students improve the quality of the information that they absorb from their reading, students might use color highlighters to mark different aspects of the text[57] or make analytically-focused margin notes. When reading cases, some visual learners find it helpful to visualize the case as a play or television show; the characters help to understand ideas, the plot helps to establish relationships between ideas, and the affectations of the characters help prioritize information. To help establish the relationship between ideas in a sentence, visual learners might try diagramming sentences. To help establish the relationship between cases or statutes and cases, professors can encourage visual learners to use charts or diagrams instead of Roman style outlines.[58] Some visual learners prefer to organize using pictures or drawings. Appendix A illustrates two different visual organizers for how to properly plead a claim: a concept map and a picture.

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55. T-charts are a note-taking technique that derive their name from drawing a big T on a piece of paper. The use of T-charts is illustrated in M.H. Sam Jacobson, *Providing Academic Support Without an Academic Support Program*, 3 J. LEGAL WRITING 246, 246–49 (1997).

56. This technique is probably effective for all students, not just those who are visual learners. Studies on memory indicate that learners remember pictures better than words or sentences. *See, e.g.,* Kobayashi, *supra* note 54 (reviewing the results of studies and the four main theories for explaining this phenomenon). No matter how simple a depiction may be, the comment that the author receives from nearly every student when she creates visual depictions of what she and her students are discussing is, "Can I have that?"

57. The use of color improves learning for learners who are visually oriented. FRANCIS M. DWYER & DAVID M. MOORE, EFFECT OF COLOR CODING ON COGNITIVE STYLE, Paper Presented at the Proceedings of Selected Research and Development Presentations at the Convention of the Association for Educational Communications and Technology and Sponsored by the Research and Theory Division, at 7 (1992) (ERIC Document Reproduction Service No. 347 986); David M. Moore & Francis M. Dwyer, *Effect of Color-Coding on Locus of Control*, 24 INT'L J. INSTRUCTIONAL MEDIA 145, 146–47 (1997); FRANCIS M. DWYER, STRATEGIES FOR IMPROVING VISUAL LEARNING (1978).

58. Computer software is available to help visual learners organize material, including most presentation software packaged with word processing suites. Software designed specifically for educators and visual learners includes Inspiration, available from Inspiration Software, Inc. of Portland, Oregon. This software allows the user to create a visual organizer, e.g., concept map, web, or diagram, and then convert it to a traditional outline format. I have also used the program backwards by entering a traditional outline and converting it to a visual format.

Helping visual students to organize will have a dramatic effect on their performances.[59]

c. Oral Learners

Following verbal learners and visual learners, the next most common learner is one whose strong mode of absorbing information is oral. Students who come from an environment with an oral tradition are often oral learners. [60] Students who are oral learners need to talk out their ideas. They are the students who frequently contribute to class discussion as their way of processing information or developing ideas. They are the students who get a D on their appellate brief but win the oral competition. For oral learners to thrive, they need to have opportunities to talk.

Professors can assist oral learners in their classrooms and in one-on-one sessions by giving them opportunities to talk. In the class-room, breaking the students into small groups for a project or discussion will give more students the opportunity to talk, including those oral learners who are too intimidated to contribute to discussion in the full class or who are eager to contribute but may not have sufficient opportunity. Some oral learners may have too much opportunity to talk in the classroom; those who contribute too often may be scorned by their peers when their ideas are undeveloped, and dreaded by their professors because their ideas may not be furthering class discussion.

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59. *See* Patton, *supra* note 47, at 2–3. Studies cited in this article indicate that poor learners are poor organizers. *Id.* at 2 n.9 (citing Thomas J. Shuell, *The Effect of Instructions to Organize for Good and Poor Learners*, 7 INTELLIGENCE 271, 272–78 (1983)). When students were helped to develop organizational skills appropriate to their learning style, the difference in performance between good and poor learners was approximately cut in half. *Id.* at 3 n.14 (citing Shuell, *supra* note 60, at 282). For additional ideas on how material can be visually organized, see Matthew J. McCloskey, Comment, *Visualizing the Law: Methods for Mapping the Legal Landscape and Drawing Analogies*, 73 WASH. L. REV. 163 (1998) (includes examples of visual metaphors); CORINNE COOPER, GETTING GRAPHIC 2: VISUAL TOOLS FOR TEACHING AND LEARNING LAW (1994); TONY BUZAN, THE MIND MAP BOOK (1993); Joseph D. Novak, *Concept Maps and Vee Diagrams: Two Metacognitive Tools to Facilitate Meaningful Learning*, 19 INSTRUCTIONAL SCI. 3, 29–33 (1990); Benjamin Moshe-Nevah et al., *Use of the Ordered Tree Technique to Assess Students' Initial Knowledge and Conceptual Learning*, 16 TEACHING PSYCHOL. 182, 184, 186 (1989); RICHARD SINATRA, VISUAL LITERACY CONNECTIONS TO THINKING, READING, AND WRITING 170–71, 234–45 (1986); Alice M. Derr & Chris L. Peters, *The Geometric Organizer: A Study Technique*, 21 ACAD. THERAPY 357, 357–66 (1986).

60. African American learning styles have roots in West African culture, which is predominately oral and relational. HALE-BENSON, *supra* note 5, at 14–16. Generally, children's cultural values are reflected in their learning behaviors. DARLENE M. FIERRO, IS THERE A DIFFERENCE IN LEARNING STYLE AMONG CULTURES? 1 (1997) (ERIC Document Reproduction Service No. ED 415 974) (citing Francesina R. Jackson, *A Sixth-Sense Cultural Sensitivity*, 25(2) LEARNING 67–71 (1996)); HERMAN A. WITKIN & D.R. GOODENAUGH, COGNITIVE STYLES: ESSENCE AND ORIGIN 81–82 (1981).

However, these oral learners can orally process the material in class without dominating class discussion. For example, professors can encourage these students to engage in a silent conversation with themselves: the students can answer the professors' questions within their heads, and then compare their answers to those given by other students.

In addition, professors can encourage oral learners to work through class material by discussing it with their professors during office hours, with tutors or teaching assistants, or in study groups. These same resources would also be available for discussing text. Finally, professors can encourage oral learners to improve their absorption of text by reading aloud when studying alone.

d. Aural Learners

The next most common learners are those whose strong mode of absorbing information is aural.[61] Aural learners learn well from listening to lectures, class discussions, study group discussions, the professor, tutors, teaching assistants, or tapes. Aural learners may improve their absorption of information by seeking out additional opportunities to listen, e.g., by taping their classes for later review, or by minimizing distractions while listening, e.g., by taking fewer notes in class, by not taking notes on a laptop, or by sitting in the front of the classroom.

e. Tactile and Kinesthetic Learners

Finally, the least common learners in law school are those whose strongest modes of absorbing information are tactile or kinesthetic. However, many law students learn better if they can complement another mode of absorbing information with a tactile or kinesthetic mode, e.g., by touching and feeling what they are to absorb. Learners who are strongly tactile or kinesthetic learn well by doing. In the classroom, this might include simulations, role-playing, clinical experiences, and other skills or experiential activities. Outside the classroom, this might include externships, internships, and clerkships. Tactile learners may do better with a handout or a book in hand. Kin-

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61. While most students have had extensive experience with aural learning, it usually is not the dominant mode for absorbing information. *See* Robert S. Ristow et al., *Learning Preferences: A Comparison of Gifted and Above-Average Middle Grades Students in Small Schools*, 8 ROEPER REV. 119, 119–24 (1986); Emily D. Stewart, *Learning Styles Among Gifted/Talented Students: Instructional Technique Preferences* 48 EXCEPTIONAL CHILD. 134, 134–38 (1981). However, it may be the dominant mode for Native Americans. Gregory A. Cajete, *The Native American Learner and Bicultural Science Education*, *in* NEXT STEPS: RESEARCH AND PRACTICE TO ADVANCE INDIAN EDUCATION 135, 141 (Karen Gayton Swisher & John Tippeconnic eds., 1999).

esthetic learners may do better if they can move around when they study, e.g., by moving to music, standing, or pacing. Both tactile and kinesthetic learners may learn well from computer-aided instruction, including CALI tutorials.

f. Accommodating Different Styles of Absorbing Information

The preferred learning mode of many students may not be readily apparent to professors or even known by the student. This is because most students have done well in the verbal mode and have not yet been sufficiently challenged by the workload or the higher level of learning required for law school to know that the verbal mode of absorbing information is not efficient for them. How, then, do professors teach to the different learning modes?

First, professors generally can teach to all learning modes since their classes most likely include each type of learner. For example, professors can provide written materials or resources in advance of class and use class time to visually and orally review and further explore key concepts in the materials. In addition, professors can provide opportunities for students to do something with the materials, whether it be to work though a hypothetical provided in advance of class or to complete an assignment. Many professors already integrate their classes, if not to teach to diverse learning modes, then to make their classes more interesting.

However, this integration may not be sufficient for all students. To enable those students to modify their study rituals so that they complement their preferred learning modes, professors may want to help those students determine what their preferred learning modes are. While a number of evaluations exist for determining preferred modes of absorbing information,[62] the simple checklist and series of true-false

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62. *E.g.*, Walter B. Barbe & Michael N. Milone, Jr., *Modality*, 89 INSTRUCTOR 44, 46 (1980) (Barbe-Milone Modality Checklist) (the 10 items in this instrument test three modalities—visual, auditory, and kinesthetic); BARBE, *supra* note 44, at 35 (Swassing-Barbe Modality Index) (instrument tests recall within three modalities); ALBERT A. CANFIELD, CANFIELD LEARNING STYLES INVENTORY FORM S-A 5 (3d ed. 1983) (one of the four areas assessed by this instrument is one's preferred learning mode: listening, reading, iconic experience, direct experience); GARY E. PRICE ET AL., PRODUCTIVITY ENVIRONMENTAL PREFERENCE SURVEY (1982) (PEPS) 12–14 (one of the four categories of this instrument tests for four modalities: auditory, visual, tactile, and kinesthetic); M.H. SAM JACOBSON, LEARNING MODE ASSESSMENT (1997) (simple instrument differentiates learners who absorb information visually/spacially, verbally, aurally, or orally; in Appendix B of this article); JAMES W. KEEFE ET AL., LEARNING STYLE PROFILE HANDBOOK: II. ACCOMMODATING PERCEPTUAL, STUDY, AND INSTRUCTIONAL PREFERENCES (1989) (portion of instrument tests for three modalities: kinesthetic, visual/spatial, and auditory/verbal); Detlev Leutner & Jan L. Plass, *Measuring Learning Styles with Questionnaires Versus Direct Observation of Preferential Choice Behavior in Authentic Learning Situations: The Visualizer/Verbalizer Behavior Observations Scale (VV-BOS)*, 14

questions in Appendix B may suffice for most students to offer them some insight into how they might better absorb information.[63] With the results of this assessment, students can develop more effective study rituals.[64]

2. Information Processing Models

After learners absorb information, they process it. Learners have habitual modes of processing information, and these modes have received considerable discussion in the educational psychology literature. This article will discuss the most significant schemata and evaluate what they mean for the classroom.
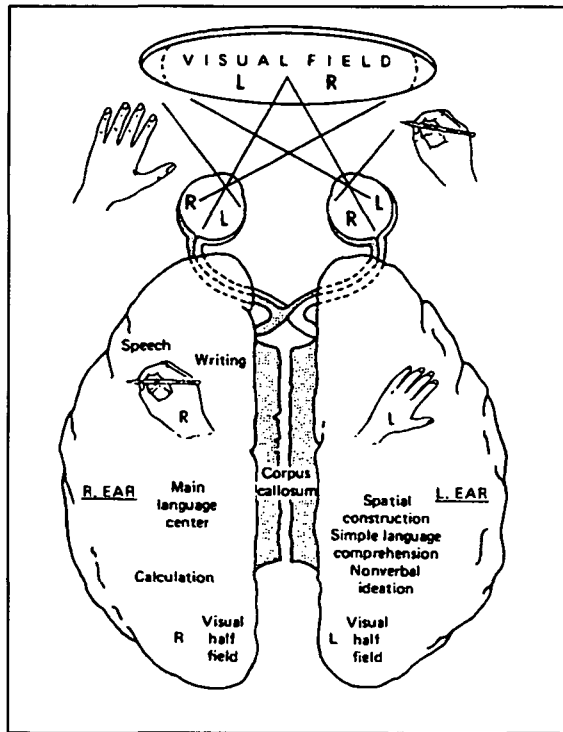
a. Left-Brain/Right-Brain Functions

Any discussion of information processing must begin with how the brain functions, specifically the left-brain and right-brain functions. How learners process information depends on which hemisphere of their brain they habitually rely upon for processing information. As illustrated below, the left-brain primarily governs language and writing, and the right-brain governs spatial construction:[65]

COMPUTERS HUM. BEHAV. 543, 543–57 (1998) (tests student preferences for visual or verbal learning material).

63. You have my permission to use the copyrighted Learning Mode Assessment in Appendix B for classroom or educational purposes so long as photocopies are made, the Assessment is used at no cost, and I am identified as the author and copyright holder. For any other use, please contact me to obtain permission. For guidance on how to interpret the results of a Learning Mode Assessment, see M.H. Sam Jacobson, *How Students Absorb Information: Determining Modality*, 8 J. LEGAL WRITING (forthcoming 2001).

64. Knowing what is the most effective way to absorb information can be empowering to the student. For example, at the end of the first year of law school, one student, who was a visual learner, told me that she had met with her Contracts professor to discuss a question she had about the material. When the professor began to answer her question, she interrupted him and told him that she would understand it better if he would draw her a picture rather than just talk to her. The professor drew a simple diagram illustrating his point, which she had no trouble understanding. She said that she was struck by how easy it was to understand once she could see it.

65. KOLB, *supra* note 44, at 47.

Various studies exploring the left-brain/right-brain functions indicate that the left-brain processes information analytically and linearly, and the right-brain processes information synthetically and creatively.[66] The differences between the two brain functions are noted in the following chart:[67]

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66. SILVERMAN & CASAZZA, *supra* note 43, at 44, 187–92 (discussing the results of some of the research projects).
    67. BETTY EDWARDS, DRAWING ON THE RIGHT SIDE OF THE BRAIN 40 (1979); KOLB, *supra* note 44, at 49.

A Comparison of Left-Mode and Right-Mode Characteristics

L-MODE	R-MODE
Verbal: Using words to name, describe, define.	**Nonverbal**: Awareness of things, but minimal connection with words.
Analytic: Figuring things out step-by-step and part-by-part.	**Synthetic**: Putting things together to form wholes.
Symbolic: Using a symbol to *stand for* something. For example, the drawn form ◉ stands for *eye*, the sign + stands for the process of addition.	**Concrete**: Relating to things as they are, at the present moment.
Abstract: Taking out a small bit of information and using it to represent the whole thing.	**Analogic**: Seeing likenesses between things, understanding metaphoric relationships.
Temporal: Keeping track of time, sequencing one thing after another: Doing first things first, second things second, etc.	**Nontemporal**: Without a sense of time.
Rational: Drawing on conclusions based on *reason* and *facts*.	**Nonrational**: Not requiring a basis of reason or facts; willingness to suspend judgment.
Digital: Using numbers as in counting.	**Spatial**: Seeing where things are in relation to other things, and how parts go together to form a whole.
Logical: Drawing conclusions based on logic: one thing following another in logical order—for example, a mathematical theorem or a well-stated argument.	**Intuitive**: Making leaps of insight, often based on incomplete patterns, hunches, feelings, or visual images.
Linear: Thinking in terms of linked ideas, one thought directly following another, often leading to a convergent conclusion.	**Holistic**: Seeing whole things all at once; perceiving the overall pattern and structures, often leading to divergent conclusions.

While all learners use both parts of their brains,[68] most learners have a dominant hemisphere that affects their style of processing information. This processing difference does not affect ability[69] unless

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68. *See* ROBERT ORNSTEIN, THE RIGHT MIND: MAKING SENSE OF THE HEMISPHERES 68 (1997).

69. SILVERMAN & CASAZZA, *supra* note 43, at 44 (citing Anita N. Kitchens et al., *Left-brain/Right-brain Theory: Implications for Developmental Math Instruction*, 8 REV. RES. DEVELOPMENTAL EDUC. 3 (1991)); Richard D. MacNeil, *The Relationship of Cognitive Style and Instructional Style to the Learning Performance of Undergraduate Students*, 73 J. EDUC. RES.

the manner of teaching and the manner of processing are in conflict.[70] American schools favor a left-brain approach to teaching and learning.[71] As a result, right-brain learners are often disadvantaged.[72] Since many ethnic and racial minorities are right-brain learners,[73] not recognizing right-brain thinking in law classrooms disadvantages them.[74] Right-brain activities would include problem-solving, communicating with visuals, relating concepts to a personal context, handling cases, working with practice sets, connecting parts to the whole, and physical or verbal demonstrations. Left-brain activities would include analyzing information presented in a linear manner, step-by-step activities, outlining, multiple-choice exams, and using words to represent abstract concepts. When right-brain activities are included in the classroom, right-brain students may have an easier time mastering the material, resulting in improved performance.[75]

354, 355, 357 (1980) (in study of undergraduates, instructional style had a significant effect on learning performance but cognitive style did not).

70. SILVERMAN & CASAZZA, *supra* note 43, at 44. Students continually taught with materials and methods that do not match their cognitive style will have difficulty learning. Richard Riding & David Mathias, *Cognitive Styles and Preferred Learning Mode, Reading Attainment and Cognitive Ability in 11-Year-Old Children,* 11 EDUC. PSYCHOL. 383, 383–84 (1991).

71. SILVERMAN & CASAZZA, *supra* note 43, at 188.

72. At-risk students, poor achievers, dropouts, alternative school students, and incarcerated learning-disabled adults often have a more well-developed right-brain. SILVERMAN & CASAZZA, *supra* note 44, at 188–89. Generally, left-brain dominant students perform better across all subjects than right-brain students. *See* Carolina Tinajero & M. Fernanda Paramo, *Field Dependence-Independence Cognitive Style and Academic Achievement: A Review of Research and Theory,* 13 EUR. J. PSYCHOL. EDUC. 227, 227–51 (1998). However, when right-brain students are taught to their learning style, their achievement is significantly improved. Rita Dunn et al., *Effects of Matching and Mismatching Minority Developmental College Students' Hemispheric Preferences on Mathematics Scores,* 83 J. EDUC. RES. 283, 285, 287 (1990); William F. Geiser, *Effects of Learning-Style-Responsive Versus Traditional Study Strategies on Achievement, Study and Attitudes of Suburban Eighth-Grade Mathematics Students,* 22 RES. MIDDLE LEVEL EDUC. Q. 19, 19–41 (1999).

73. ORNSTEIN, *supra* note 68, at 89–90 (a disproportionately large number of right-brained individuals are members of racial and ethnic minorities); Shirley Griggs & Rita Dunn, *Hispanic-American Students and Learning Style,* 23 EMERGENCY LIBR. 11, 14 (1997) (reviews studies indicating that Hispanics are more right-brain than mainstream students); DAUNA B. BROWNE, LEARNING STYLES AND NATIVE AMERICANS 9 (1986) (ERIC Document Reproduction Service No. ED 297 906) (discussing the emphasis of Native American culture on right-brain cognitive processes); Cooper, *supra* note 5 (1978 study of 200 Black college freshmen indicated 92% were holistic thinkers).

74. If students are uncertain if they are right-brain or left-brain dominant, various assessments exist, including the McCarthy Hemispheric Mode Indicator (HMI), BERNICE MCCARTHY, HEMISPHERIC MODE INDICATOR: RIGHT AND LEFT-BRAIN APPROACHES TO LEARNING (2000), or the Differential Hemispheric Activation Test, ROBERT ZENHAUSERN, THE DIFFERENTIAL HEMISPHERIC ACTIVATION TEST (1979), *available at* http://codi.buffalo. edu/archives/pubs/article/.neuro.

75. *See, e.g.,* Dunn et al., *supra* note 72, at 283–87. In a study of 700 developmental math students in a technical college, right-brain dominant learners improved their test scores signifi-

b. *Other Information Processing Models*

These left-brain/right-brain functions are consistent with the primary learning style models for processing information. One of the best known is Witkin's model of field dependence and field independence.[76] Using his Embedded Figures Test and other methodologies,[77] Witkin determined that some people were field-independent, that is, they had articulated styles of processing, because they immediately were able to spot a simple geometric figure embedded into a more complex figure.[78] Other people were field-dependent, that is, they had global styles of processing, because they were distracted by the surroundings of the whole and had more difficulty finding the embedded figure.[79] The articulated, field-independent style involves analyzing and structuring incoming information, while the global, field-dependent style accepts the totality of impressions in context but without structure.[80] In addition, a relatively field-dependent person is more sensitive to social cues and prefers to be physically close to others compared to relatively field-independent persons, who tend to have a more impersonal orientation.[81]

Similarly, Pask's model of holist and serialist processing reflects left-brain/right-brain functions.[82] A holistic learner is a global processor who sees the whole immediately, whose thinking may involve re-

cantly when visuals and personalized associations were used in instruction (taught holistically, overall concept first, then details), and the left-brain dominant learners improved significantly when instruction was delivered in a successive or sequential format. *Id.*

76. H.A. Witkin, *The Nature and Importance of Individual Differences in Perception*, 18 J. PERSONALITY 145, 145–70 (1949).

77. H.A. Witkin et al., *Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications*, 47 REV. EDUC. RES. 1, 2–6 (1977) [hereinafter Witkin (1977)] (describing methodologies); H.A. Witkin, *Individual Differences in Ease of Perception of Embedded Figures*, 19 J. PERSONALITY 1, 1–15 (1950).

78. Witkin (1977), *supra* note 77, at 7–17. Analyses and structuring are complementary aspects of articulation. *Id.* at 9–10.

79. *Id.* at 10.

80. *Id.*; STEPHEN D. BROOKFIELD, UNDERSTANDING AND FACILITATING ADULT LEARNING: A COMPREHENSIVE ANALYSIS OF PRINCIPLES AND EFFECTIVE PRACTICES 41–42 (1986). For a clear discussion of analytic and global processors and how to teach to them, see Daniele D. Flannery, *Global and Analytical Ways of Processing Information*, in APPLYING COGNITIVE LEARNING THEORY TO ADULT LEARNING 15–24 (Daniele D. Flannery ed., 1993).

81. Flannery, *supra* note 80, at 11–14. Persons are relatively field-dependent or field-independent because scores testing for this form a continuous distribution; therefore, these are tendencies and not two types of people. *Id.* at 7. No differences in learning ability or memory exist between field-dependent and field-independent persons, *id.* at 18, only differences in the ease with which they meet the requirements of certain tasks. *Id.* at 16.

82. *See* Gordon Pask, *Styles and Strategies of Learning*, 46 BRIT. J. EDUC. PSYCHOL. 128, 128–48 (1976); GORDON PASK, LEARNING STRATEGIES AND TEACHING STRATEGIES (1969).

dundancies until the process is complete, who relies on illustration and analogy, who has a wide focus of attention, and who connects information to people.[83] A serialistic learner is a linear processor whose thinking is logical, step-by-step, and efficient; who sees the whole later in the process; and who works independently.[84] Pask denotes the holist-like style as comprehension learning and the serialist-like style as operation learning.[85] Both groups reach the same level of understanding, but in completely different ways.[86]

Somewhat different models are those of sequencing. Ausubel finds that some learners are "top down" sequencers, who process information best if they have the general concepts first as an anchor to the facts that come later.[87] Other learners are "bottom up" sequencers, who process information best if they have the facts first from which the general concepts follow.[88] Siegel and Siegel visualize the processing of information on a continuum with a preference to learn factually-oriented material first at one end of the continuum and a preference to learn conceptually-oriented material at the other end.[89]
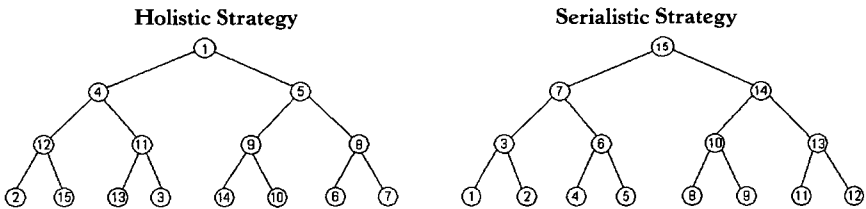
Finally, the impulsive-reflective model of processing observes the tendency of some learners to reflect over alternative solutions before responding and of other learners to make an impulsive selection.[90]

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83. *Id.*

84. *Id.*

85. *Id.*

86. Nigel Ford, *Styles and Strategies of Processing Information: Implications for Professional Education*, 3 EDUC. FOR INFO. 81, 118–19 (1985). To illustrate, holistic and serialistic processors arrive at the same result but in different paths in the following diagrams:

Holistic Strategy   **Serialistic Strategy**

[Holistic Strategy tree: root (1); second level (4), (5); third level (12), (11), (9), (8); leaves (2), (15), (13), (3), (14), (10), (6), (7).]

[Serialistic Strategy tree: root (15); second level (7), (14); third level (3), (6), (10), (13); leaves (1), (2), (4), (5), (8), (9), (11), (12).]

87. DAVID P. AUSUBEL, THE PSYCHOLOGY OF MEANINGFUL VERBAL LEARNING: AN INTRODUCTION TO SCHOOL LEARNING 79–81, 214–15 (1963); David P. Ausubel, *The Use of Advance Organizers in the Learning and Retention of Meaningful Verbal Material*, 51 J. EDUC. PSYCHOL. 267, 271 (1960). Sequencing may be connected with right-brain/left-brain functions, Riding & Mathias, *supra* note 71, at 387 (those who are right-brain or field-dependent have trouble organizing without a structured introduction first), and learning mode. *Id.* at 384 (verbal learners learn best if the textual description precedes the pictorial, and imagers, who are visual learners, learn best if the illustration precedes the text).

88. Ausubel, *supra* note 89.

89. Claudia E. McDade, *Subsumption Versus Educational Set: Implications for Sequencing of Instructional Materials*, 70 J. EDUC. PSYCHOL. 137, 137 (1978); Laurence Siegel & Lila Corkland Siegel, *Educational Set: A Determinant of Acquisition*, 56 J. EDUC. PSYCHOL. 1, 1–12 (1965).

90. Jerome Kagan, *Reflection-Impulsivity and Reading Ability in Primary Grade Children*, 36 CHILD DEV. 609, 609 (1965).

The impulsive processor answers rapidly, but with more mistakes, and the reflective processor answers more cautiously but more accurately.[91] While intelligence tests favor those who are quick and accurate,[92] some intelligent people prefer the more cautious and analytical style.[93] Further, many impulsive processors may need to develop learning tools that allow for more reflection in order to be more accurate.[94]

3. Accommodating Different Styles of Information Processing

While many students may not be aware of their habitual style for processing information,[95] professors can accommodate all styles for processing information with little difficulty. First, professors can begin each segment with a structural overview of a topic to accommodate the field-dependent/holist, who is helped by pre-structure, and the top-to-bottom processor, who needs the structural overview before the details will make sense.[96] Additionally, professors can end each segment with a structural overview to accommodate the field-

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91. *Id.* at 627; NATHAN KOGAN, COGNITIVE STYLES IN INFANCY AND EARLY CHILDHOOD 31-59 (1976), discussed in ENTWISTLE, *supra* note 12, at 205.

92. STERNBERG, *supra* note 11, at 22–24.

93. *Id.* at 24-26.

94. *Id.*; Stanley B. Messer, *Reflection-Impulsivity: A Review,* 83 PSYCHOL. BULL. 1026, 1036–37, 1047–48 (1976).

95. Numerous assessments exist for assessing styles of processing information, including PRICE, *supra* note 62. PEPS is a test for assessing how indviduals prefer to learn, concentrate, and perform in their occupational or educational activities, not how they process information. *See also* ANTHONY F. GREGORC, AN ADULT'S GUIDE TO STYLE 17–42 (1982) (Jungian-based instrument that assesses four learner preferences: Concrete Sequential, Concrete Random, Abstract Sequential, and Abstract Random); PETER HONEY & ALAN MUMFORD, LEARNING STYLES QUESTIONNAIRE (1986) (Kolb-based instrument that determines each learner's strengths in the four parts of the learning cycle) (the questionnaire is also included in Appendix A); DAVID A. KOLB, LEARNING STYLE INVENTORY 5 (1981) (instrument assesses preferred learning strengths in four areas: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation); MCCARTHY, *supra* note 74 (instrument identifies four types of learners: those who seek personal meaning, intellectual competence, solutions to problems, or hidden possibilities); HARVEY F. SILVER & J. ROBERT HANSON, LEARNING STYLE INVENTORY (1980) (Jungian-based instrument identifies four learning styles: sensing-thinkers, sensing-feelers, intuitive thinkers, intuitive feelers); GOODWIN WATSON & EDWARD M. GLASER, WATSON-GLASER CRITICAL THINKING APPRAISAL (1980), *discussed in* 3 TEST CRITIQUES 682–85 (Daniel J. Keyser & Richard C. Sweetland eds., 1985) (instrument contains subtests: Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments); and HERMAN A. WITKIN ET AL., A GROUP EMBEDDED FIGURES TEST 4 (1971) (perceptual test to determine field-dependence/field-independence).

96. An advance organizer especially has significant effect when the learner is actively engaged in sequencing the material. John Patrick & Paul Evans, *Advance Organizers and Learner Control of Sequence in Recall of Topic Attributes,* 2 HUM. LEARNING 269, 275 (1983).

dependent/holist, who may need reining in, and the bottom-to-top, factually-oriented processor, who may get lost in the details.[97]

Second, professors can develop logical structures that accommodate the field-independent/serialist but yet allow students freedom on how they arrive at those structures to accommodate the field-dependent/holist. For example, an essential legal analytical skill is to reason by analogy. An outline for reasoning by analogy would include defining the things that one wants to compare (e.g., X and Y), comparing them, and then concluding whether they are mostly similar or mostly dissimilar. To reason by analogy in law, the first thing that one would define would be the law, incorporating the rule from enacted law and the holdings of the relevant cases, the explanation of the rule included in the reasoning of the cases, and the factual illustration of the rule derived from facts of the cases. The second thing that one would define would be the facts of the legal problem. After defining these two things, one would compare them and draw a conclusion. Instead of IRAC as a representation of legal reasoning,[98] the acronym becomes RAFADC ("raffaduck"): Rule (the single point you are analyzing), Authorities (cases which give *support* for the rule, *explain* the rule, and factually *illustrate* the rule, in that order), Facts (from your problem), Analogize (determine the similarities between R, A, and F), Distinguish (determine the differences between RA and F), and Conclude (determine if R, A, and F are mostly similar or mostly different).

By establishing this outline for reasoning by analogy, the field-independent/serialist benefits because the outline gives structure, is logical, and proceeds step-by-step. The field-dependent/holistic benefits because the outline generates a competent end product without requiring that it be thought through in that order. After looking at the whole and considering all of the possibilities, the field-dependent/holistic can channel the information to produce effective and focused reasoning by analogy.

Third, professors can develop course activities and assessments that do not favor the quick over the steady to accommodate the reflective processor. Take-home exams and writing assignments may accommodate the reflective processor. Conversely, multiple-choice ex-

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97. McDade, *supra* note 89, at 137 (on an exam, conceptually-set students performed better when concepts preceded facts and factually-set students performed better when facts preceded concepts).

98. The traditional heuristic for reasoning by analogy is IRAC: Issue, Rule, Application, and Conclusion. *See, e.g.,* DIANA V. PRATT, LEGAL WRITING: A SYSTEMIC APPROACH 88, 167–75 (3d ed. 1999). This acronym is not helpful for many students because what constitutes "application" is uncertain and because it does not model analogistic reasoning. For additional criticisms of IRAC, see, e.g., 10 SECOND DRAFT 1, 1–20 (1995), a publication of the Legal Writing Institute, 900 Broadway, Seattle, Washington 98122.

ams may favor the impulsive processor. However, penalizing for incorrect answers to multiple-choice questions may promote accuracy over speed. The impulsive-reflective tendencies in processing may be intensified in multiple-choice examinations because these exams encourage impulsive (and inaccurate) answering and may paralyze the reflective students who feel stressed by time.[99]

D. Social Interaction

The fourth personal characteristic affecting learning style is social interaction. This characteristic includes students' motivations, values, and social milieu. Motivation is used to explain the level of interest in establishing and achieving goals that are consistent with students' values.[100] Social milieu concerns the social environment in which students learn best. Each of these contributes to learning and, therefore, may be considered a part of learning style. However, these may be situation specific and are more changeable than the other contributions to learning style previously discussed in this article. Nonetheless, they are worth discussing to the extent that they affect law classrooms.[101]

1. Motivation

Motivation may be either extrinsic, that is, due to some reward or punishment outside the task itself, or intrinsic, that is, the task is relevant and interesting to the learner in its own right.[102] Intrinsic mo-

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99. CLAXTON & MURRELL, *supra* note 18, at 17.

100. For a clear and concise discussion of motivation, see ENTWISTLE, *supra* note 12, at 193–98; SILVERMAN & CASAZZA, *supra* note 43, at 92–115.

101. For students who may be unaware of their sociological preferences, several tests are available, including CANFIELD, *supra* note 62 (instrument measures affective variables (personality or attitudinal values) that may affect learning); PRICE, *supra* note 63 (one of five categories in this instrument tests for emotionality, including persistence, motivation, responsibility, and structure); ANTHONY F. GRASHA ET AL., THE GRASHA-REICHMANN STUDENT LEARNING STYLE QUESTIONNAIRE (1975) (unpublished test provided by ETS Test Collection to educators and psychologists) (assesses six learning styles that are primarily sociological and motivational: Independent, Dependent, Avoidant, Participant, Collaborative, and Competitive); *see also* KEIRSEY & BATES, *supra* note 33 (MBTI-based assessment of four temperaments: Dionysian (SPs), Epimethean (SJs), Promethean (NTs), Apollonian (NFs)) (copy on file with author); JOSEPH S. RENZULLI & LINDA H. SMITH, LEARNING STYLES INVENTORY (1978), *discussed in* 2 TEST CRITIQUES 402–410 (Daniel J. Keyser & Richard C. Sweetland eds., 1985) (instrument assesses student satisfaction with nine teaching modes: projects, drill and recitation, peer teaching, discussion, teaching games, independent study, programmed instruction, lecture, and simulation); WILL SCHUTZ, FUNDAMENTAL INTERPERSONAL RELATIONS ORIENTATION—BEHAVIOR (B) AND FEELINGS (F) (1967), *discussed in* 1 TEST CRITIQUES 284–87 (Daniel J. Keyser & Richard C. Sweetland eds., 1984) (instrument measures a person's needs and desires in his or her relations with others in the areas of inclusion, control, and affection).

102. R.S. PETERS, THE CONCEPT OF MOTIVATION 38–50 (2d ed. 1960).

tivations satisfy personal values such as self-esteem or the need for achievement.[103] With achievement comes self-confidence, higher motivation, and further effective learning;[104] with failure comes demoralization, hostility to school, and feelings of personal humiliation.[105] When the fear of failure (anxiety) outweighs the positive interest in achievement, the learner will avoid achievement situations.[106] Where fear of failure is dominant, success and praise are essential.[107] Alternatively, a certain amount of criticism may increase motivation for a more confident student.[108] Too much success for the self-confident student can diminish performance in the same way that too much failure can for the anxious.[109]

Motivation involves the desire to achieve goals.[110] Students may have different goals in different contexts, each reflecting different motivations.[111] Goals include mastery goals, which lead to more engagement in the learning process and more metacognitive strategies, and performance goals, which involve comparisons with others and competition.[112] Performance goals focus on memorization, while mastery goals focus on problem solving and critical thinking.[113]

In addition, all goals have certain qualities that explain how the goals affect behavior: specificity, proximity, and difficulty level.[114] Students will be more motivated to learn if their goals are specific, rather than general; proximal, rather than distal; and within perceived levels of ability and knowledge, rather than outside them.[115] Specific goals are those that outline in detail what one needs to accomplish.[116] Proximal goals are those that are attainable within a relatively short

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103. JOHN WILSON, PHILOSOPHY AND EDUCATIONAL RESEARCH 100 (1972).

104. *See* GORDON W. ALLPORT, PATTERN AND GROWTH IN PERSONALITY 226–37 (1961).

105. *See* JOHN C. HOLT, HOW CHILDREN FAIL 37–69 (1964).

106. JOHN W. ATKINSON & NORMAN T. FEATHER, A THEORY OF ACHIEVEMENT MOTIVATION 363–66 (1966).

107. *See* BERNARD WEINER, THEORIES OF MOTIVATION: FROM MECHANISM TO COGNITION 199–201 (1972).

108. *Id.*

109. *Id.*

110. PAUL R. PINTRICH & DALE H. SCHUNK, MOTIVATION IN EDUCATION: THEORY, RESEARCH AND APPLICATIONS 4 (1996).

111. *See id.* at 5.

112. Martin L. Maehr & E.M. Anderman, *Reinventing Schools for Early Adolescents*, 93 ELEMENTARY SCH. J. 593, 593–610 (1993).

113. *Id.*

114. Dale H. Schunk, *Goal Setting and Self-Evaluation: A Social Cognitive Perspective on Self-Regulation, in* ADVANCES IN MOTIVATION AND ACHIEVEMENT 85–113 (Martin L. Maehr & Paul R. Pintrich eds., 1991).

115. *Id.*

116. *Id.*

period of time and give better opportunities for feedback about performance.[117] Goals within perceived levels of ability and knowledge are those that students believe are achievable.[118]

In law school, students are extrinsically motivated, e.g., to complete law school successfully, to pass the bar, and to practice law. However, this does not necessarily equate to motivation to master particular material. For that, students need intrinsic motivation.[119] Students will be more intrinsically motivated to master the material when they have positive achievements. To a certain degree, professors can convey success or failure in the way that they respond to student contributions to classroom discussion. However, the most significant assessment of performance, the grade on the final examination, is given after the class has ended and without feedback. Additional opportunities for assessment and feedback may increase intrinsic motivation to achieve mastery.

In addition, classroom activities will promote intrinsic motivation to learn when they include specific, proximal, and manageably difficult tasks. Students will be more motivated to learn when they have specific goals, e.g., to complete specific assignments, rather than a general goal of passing the final exam. Students will also be more motivated to learn when they have proximal goals, e.g., to complete an assignment for next week, rather than to pass a final exam at the end of the semester. Finally, students will be more motivated to learn when they believe that they can accomplish a task, e.g., by working on parts that build to a whole, such as mastering how to introduce documents into evidence, rather than beginning with a complete trial. Professors can enhance their students' motivation if they set clear and specific goals, make the goals sufficiently challenging but not overwhelming, set both intermediate and semester-long goals, and provide feedback that allows for improvement and that increases self-confidence for achieving the end goal.

2. Social milieu

The social milieu in which learning takes place affects student comfort; the more comfortable the learner, the more the student will

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117. *Id.*

118. *Id.*

119. The most potent motivators for adult learners are internal, including self-esteem, recognition, better quality of life, greater self-confidence, and self-actualization. Malcolm S. Knowles, *Introduction: The Art and Science of Helping Adults Learn, in* MALCOLM S. KNOWLES ET AL., ANDRAGOGY IN ACTION: APPLYING MODERN PRINCIPLES OF ADULT LEARNING 12 (1984) (citing FREDERICK HERZBERG, WORK AND THE NATURE OF MAN 72–91 (1966) and ABRAHAM H. MASLOW, MOTIVATION AND PERSONALITY 45–50 (2d ed. 1970)).

learn.[120] Students learn in a variety of social situations including working alone, working in pairs, working with a group, and working with experienced adults,[121] e.g., professors and attorneys. Some students move easily from one social situation to another, but others have distinct preferences. For example, when I ask students to work in groups of three or four to do an assignment, not all students cotton to the task. In some groups, the discussion begins immediately and all members contribute. In other groups, no discussion occurs until all of the members have individually worked through the assignment first. In yet other groups, a combination of these occurs: some members discuss while other members work by themselves and join the group discussion later when they are ready to pool answers. Finally, in other groups, the discussion begins immediately but it involves socializing, rather than the assignment.

Since education has traditionally encouraged and rewarded students who work alone, most law professors probably learned well in that manner. However, education has changed and many law students grew up in learning environments that also rewarded group work.[122] Further, many of the students who excelled in their group work are rudderless and uncomfortable when they are expected to work alone.[123] Professors can easily accommodate different sociological styles of learning by encouraging and facilitating study groups and by incorporating group work into the classroom. One easy way to incorporate group work into the classroom would be to have students discuss hy-

120. *See* RUDOLPH H. MOOS, THE HUMAN CONTEXT: ENVIRONMENTAL DETERMINANTS OF BEHAVIOR 213–45 (1976).

121. RITA DUNN & KENNETH DUNN, TEACHING STUDENTS THROUGH THEIR INDIVIDUAL LEARNING STYLES: A PRACTICAL APPROACH 12 (1978).

122. Books promoting cooperative learning first appeared in the 1970s. *E.g.*, DAVID W. JOHNSON & ROGER T. JOHNSON, LEARNING TOGETHER AND ALONE: COOPERATIVE, COMPETITIVE, AND INDIVIDUALISTIC LEARNING (4th ed. 1994). A search of Amazon.com recovered 199 books discussing "cooperative learning" and a search of "cooperative learning" of scholarly articles on MasterLIST Premiere, a selective periodical subscription service, generated 593 articles on the topic since 1990. For additional information about the history and prevalence of cooperative learning in elementary, secondary, and college education, see Bonnie K. Nastasi & Douglas H. Clements, *Research on Cooperative Learning: Implications for Practice*, 20 SCH. PSYCHOL. REV. 3, 110–39 (1991); COLLABORATIVE LEARNING: UNDERLYING PROCESSES AND EFFECTIVE TECHNIQUES (Kris Bosworth & Sharon J. Hamilton eds., 1994); Robert E. Slavin, *Cooperative Learning in Middle and Secondary Schools*, 69 CLEARING HOUSE 200 (1996).

123. Failure to include group activities may disproportionately affect African American, Hispanic, and Native American students. *See, e.g.*, Norris M. Haynes & Sara Gebreyesus, *Cooperative Learning: A Case for African-American Students*, 21 SCH. PSYCHOL. REV. 521, 578–82 (1992) (discusses the importance of group work for African American students to thrive academically); Cajete, *supra* note 61, at 143–44 (Native Americans generally prefer to work in groups); Cooper, *supra* note 4 (citing MANUEL RAMÍREZ III & ALFREDO CASTAÑEDA, CULTURAL DEMOCRACY, BICOGNITIVE DEVELOPMENT, AND EDUCATION (1974) (Hispanics generally prefer to work in groups).

potheticals in groups, rather than relying on individual students through a quasi-Socratic method, although group assignments also can take place outside of class. Group assignments can be simple applications of information or more complex work, and they can be graded or non-graded, depending on your educational objectives.[124]

E. *Instructional Preferences*

The fifth personal characteristic affecting learning style is instructional preferences. This characteristic concerns the environmental factors that affect students' ability to learn. These factors include sound (background noise, quiet), light (bright lights, windows), temperature (cool, warm), design (desk and chair preferences, isolated or with others, clean or messy), mobility (need to move around), time (duration, time-of-day), and personal quirks (yellow pads, pen or highlighter preferences).[125] These factors are generally not within the control of individual professors. They are controlled either by the law school in the design of its facility or development of its policies, such as whether to allow beverages in the library, or by the students. Since most students enter law school with at least sixteen years of student experience, presumably they are well aware of their likes and dislikes when they study.[126]

III. APPLYING LEARNING STYLES TO THE LEARNING CYCLE AND EFFECTIVELY HELPING OUR LAW STUDENTS GROW

In addition to considering students' learning styles in their teaching, professors also need to consider how to move their students to a complete learning experience, one that will achieve a complex level of learning and analysis, rather than the simple level of memorization. Teaching to different learning styles, especially to different modes of

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124. *See* Clifford S. Zimmerman, *"Thinking Beyond My Own Interpretation": Reflections on Collaborative and Cooperative Learning Theory in the Law School Curriculum* 31 ARIZ. ST. L.J. 957 (1999); KENNETH A. BRUFFEE, COLLABORATIVE LEARNING: HIGHER EDUCATION, EDUCATION, INTERDEPENDENCE, AND THE AUTHORITY OF KNOWLEDGE (2d ed. 1999); DAVID W. JOHNSON & ROGER T. JOHNSON, LEARNING TOGETHER AND ALONE: COOPERATIVE, COMPETITIVE, AND INDIVIDUALISTIC LEARNING (4th ed. 1994); SPENCER KAGAN, COOPERATIVE LEARNING (1994); BARBARA J. MILLIS & PHILIP G. COTTELL, JR., COOPERATIVE LEARNING FOR HIGHER EDUCATION FACULTY (1998); LYNDA A. BALOCHE, THE COOPERATIVE CLASSROOM: EMPOWERING LEARNING (1998).

125. *See, e.g.*, PRICE, *supra* note 62, at 3 (two of four categories in this instrument test for environmental and physical preferences for learning, including sound level, lighting, temperature, design, time of day, intake needs, and mobility needs); KEEFE, *supra* note 63 (assesses study and instructional preferences including time of day, design, mobility, sound, lighting, and temperature).

126. Should any student be in doubt about his or her environmental preferences, either of the tests in note 125 would be helpful.

absorbing information, will help law students learn. However, teach-
ing to different learning styles is not enough to move students to a
more complex level of learning. To make that move, professors need
to consider both the characteristics of the learning cycle and whether
professors are guiding their students, who generally are adult learn-
ers,[127] to mastery by completing that cycle.

A. *Complete Learning Experience*

A complete learning experience is one that involves all stages of
the learning cycle. The learning cycle has four stages: (1) having an
experience, (2) reviewing the experience, (3) concluding from the ex-
perience, and (4) doing something with the experience, such as plan-
ning the next steps or applying it to solve a problem.[128]
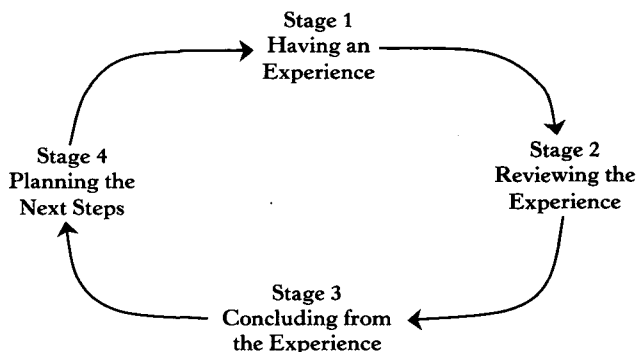
Each stage in the learning cycle is important and necessary.[129]
First, a learner must have something to learn. Each new experience,
whether it is reading this article, participating in a discussion, or ad-
mitting expert testimony, gives a learner something to learn. For
adult learners, those experiences need to be in context and to connect
with prior experiences.[130] Second, a learner must reflect on the experi-
ence to determine the adequacy and relevancy of the information gath-
ered from it. Third, a learner must understand what that new experi-

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127. An adult learner is a person beyond compulsory school age who is voluntarily enrolled
in a course of study to develop new skills or qualifications or to improve existing skills or
qualifications. BROOKFIELD, *supra* note 81, at 5.

128. PETER HONEY & ALAN MUMFORD, THE MANUAL OF LEARNING STYLES 4 (1992);
KOLB, *supra* note 44, at 42.

129. *See* HONEY & MUMFORD, *supra* note 128, at 3–4; KOLB, *supra* note 44, at 42.

130. KNOWLES ET AL., *supra* note 119, at 9–12. Adult learners connect new information
to prior experiences, they learn something new when they have a reason for knowing it, and they
learn what matters to their life, their immediate task, or solving a problem, not just for the sake
of learning. *Id.*

ence means. This includes drawing conclusions from it and putting it
into theoretical perspective by creating an analytical framework from it
or integrating it into an existing analytical framework. Fourth, a
learner must do something with the information. Applying the infor-
mation tests the validity of the experience and determines if the
learner needs more input. This is the stage of analogies, transference,
and problem-solving.

In addition, all stages of the learning cycle are equally impor-
tant.[131] Without new experiences, learners would conclude from in-
complete input, and any applications would be inadequate because
they would not have considered sufficient perspectives. Without re-
flection, learners would collect experiences without determining what
they could extract from them, would draw conclusions and create
paradigms without adequate support, and would act without an ade-
quate foundation. Without an analytical framework, learners would
collect experiences without determining what they could build from
them, would get lost in details, and would have difficulty applying or
using information because they would have no structure for analogy or
for making modifications. Without application, learners would collect
experiences without determining what they can use from them for
solving problems, whether the information absorbed is accurate, or
whether the framework constructed from the information is valid.

Finally, the stages of the learning cycle must be in balance.[132]
Learning is not complete if learners are overly strong in one aspect of
the learning cycle at the expense of other aspects. To illustrate, if
learners are overly strong in having new experiences, they may become
manic, where the only value is having new experiences, not what they
might extract from them. If learners are overly strong in reflecting,
they may become paralyzed by details and unable to organize or see
the bigger picture. If learners are overly strong in concluding, they
may be concluding without adequate foundation for their conclusions
or they might be too abstract and insufficiently concrete. If learners
are overly strong in application, they might be acting without ade-
quate foundation for their plan, impatient, or interested only in quick
fixes.

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131. HONEY & MUMFORD, *supra* note 128, at 3–4, 47–48.
132. *Id.*

B. Well-Rounded Learners

For an effective learning experience, learners must be well-rounded, that is, they must master the entire learning cycle.[133] Professors can help students do that through the ways that they teach. First, professors need to provide students with experiences beyond reading cases, listening to lectures, and class discussion. For students who are fearful of new experiences, use incremental assignments that build up to the ultimate experiences so as not to overwhelm them and create anxiety that would be counterproductive to learning. For all students, connect new experiences to those they have already had.

Second, professors need to give students opportunities for reflection. Professors can do that by providing assignments, including reading assignments, well in advance of the due dates, requiring reflective journals, and giving opportunities for observation.

Third, professors need to assist students in synthesizing material and developing organization. Course texts provide some organizational guidance, but it is generally inadequate. The tables of contents may follow historical developments or schools of thought rather than the analytical framework required for legal analysis. A section within a casebook might include several illustrative cases, but leave it to the reader to determine the connection between them. In addition, classroom discussion provides only limited synthesis and organizational guidance, particularly if the professor relies on a quasi-Socratic method style of discussion, where cases are generally discussed sequentially. In order to help students develop organizational skills, professors can provide them with organizational cues that preview new material,[134] with instructions on how to organize, and with opportunities to practice organization. Instructions might include more clearly identifying which cases, when synthesized, would create an analytical framework for a particular point; what resources, e.g., treatises or law review articles, might help students synthesize and structure material; what different forms of organization might look like;[135] and what dif-

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133. Students can evaluate their strengths and weaknesses in the learning cycle by taking the eighty item Learning Styles Questionnaire developed by HONEY & MUMFORD, *supra* note 95. By knowing their strengths and weaknesses in the learning cycle, students can use their strengths to improve in the weaker areas. Jacobson, *supra* note 37, at 305–12.

134. "The most important single factor influencing learning is what the learner already knows." DAVID P. AUSUBEL ET AL., EDUCATIONAL PSYCHOLOGY: A COGNITIVE VIEW 163 (2d ed. 1978). Therefore, the teacher should use advance organizers, which preview the new material, in the presentation of information to the learner in order to facilitate linkages with pre-existing knowledge. *Id.* at 164.

135. Examples of different graphical forms of organization are illustrated in William M. Richman, *Conflict of Laws Symposium: Graphic Forms in Conflict of Laws*, 27 U. TOL. L. REV. 631 (1996) (includes charts, graphs, flow charts, and diagrams); *see also* Graphic Organizers, *at*

ferent organizational tools are available to create the different organizational forms.

Fourth, professors need to give students opportunities to apply what they have absorbed. This is probably the most overlooked aspect of the learning cycle in most traditional law school classrooms. Most casebooks provide a limited form of application when cases are followed by case notes that pose various questions of fact or policy for the reader to consider. In addition, most professors provide a limited form of application in the classroom when they ask students to apply law from a case to a hypothetical. However, students need opportunities to apply information that engages them more deeply in the material. Theories of negotiation have little real meaning until the learner attempts a negotiation. The requirements for pleadings under the rules of civil procedure have little real meaning until the learner attempts to draft one. The elements of negligence have little real meaning until the learner uses them to role-play or to advise a client of the probability of success. The application need not be complicated, only sufficient to put the theoretical information into context and to require analysis.

IV. CONCLUSION

Teaching to every law student need not be a burdensome or overwhelming task. It only requires that professors be aware of how different students learn and that professors acknowledge the different paths that students take in the way that professors manage their classrooms and their office hours. The most important paths to acknowledge are the different modes of absorbing information, the different ways of organizing information, and the different strengths in the learning cycle. Professors can acknowledge the different modes of absorbing information by supplementing text with visual, oral, and aural cues. Professors can acknowledge the different ways of organizing by providing holistic learners with organizational tools that may be intuitive to analytic learners. Finally, professors can lead their students to deep analytical thought by incorporating all phases of the learning cycle into their instruction.
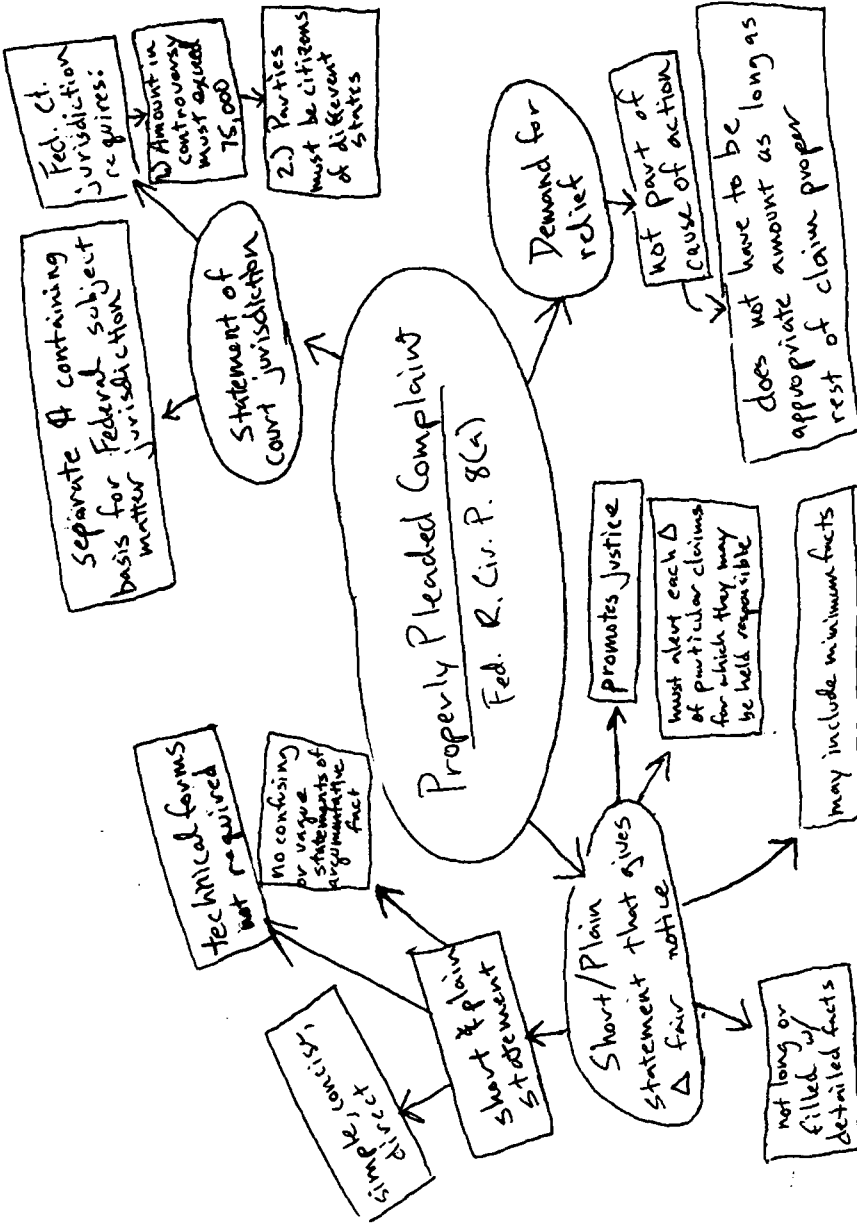
If students are not absorbing essential information, if they are unable to separate information into logical parts, and if they are unable

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http://www.ncrel.org/sdrs/areas/issues/students/learning/lr1grorg.htm (last visited Aug. 11, 2001) (includes spider map, series of events chain, continuum scale, compare/contrast matrix, problem/solution outline, network tree, human interaction outline, fishbone map, and cycle); Cooper, *supra* note 59 (includes tabulations, reconstructions, continuums, dyads, time lines, charts, matrices, graphs, flow charts, Venn diagrams, pictures, and illustrations).

to apply their knowledge and critically evaluate the results, they will do poorly regardless of how hard they work. For many law students, law school may never be a comfortable intellectual experience. However, with a bit of forethought, professors can at least make it an intellectually successful one.

APPENDIX A

Concept Map

Concept map (handwritten):

- **Properly Pleaded Complaint — Fed. R. Civ. P. 8(a)** (central node)
  - **Statement of Court Jurisdiction**
    - Fed. Ct. jurisdiction requires:
      - 1.) Amount in controversy must exceed 75,000
      - 2.) Parties must be citizens of different states
    - Separate ¶ containing basis for Federal subject matter jurisdiction
  - **Demand for relief**
    - not part of cause of action
    - does not have to be appropriate as long as amount rest of claim proper
  - **Promotes justice**
    - must alert each Δ of particular claims for which they may be held responsible
    - may include minimum facts
  - **Short/Plain statement that gives Δ fair notice**
    - Short & plain statement
      - simple, concise, direct
      - technical forms not required
      - No confusing or vague statements of argumentative fact
    - not long or filled w/ detailed facts

Picture

[Please see color reproduction on page 341.]

Appendix B

The following checklist and true-false questions help identify those students who prefer to learn verbally (reading, writing), orally (discussion as participant), aurally (lecture, discussion as listener, audiotapes), or visually (videos, overheads, colors).

LEARNING MODE ASSESSMENT

For each of the following pairs, check your preferred choice for how you learn best:

☐ lectures	☐ reading
☐ reading	☐ discussion
☐ discussion	☐ lecture
☐ writing	☐ discussion
☐ pictures	☐ words
☐ color	☐ print (B & W)
☐ charts	☐ written narrative
☐ audiotapes	☐ reading
☐ talking	☐ listening

Indicate if the following are true or false when you recall information:

T F   I remember the idea.

T F   I remember where the idea appears on the page or in my notes.

T F   I remember the illustration, diagram or chart that the information was in.

T F   I remember what someone said about the idea.

T F   I remember what I read.

T F   I remember what I wrote about the information.

T F   I remember the story from which the idea arose.

T F   I remember talking about the idea.

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