March 21, 2011

Teaching Like Lawyers: What Empirical Research Can Tell Us About the Effect of Law School Pedagogy on Law Student Learning Styles

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TEACHING LIKE LAWYERS: WHAT EMPIRICAL RESEARCH CAN TELL US ABOUT THE EFFECT OF LAW SCHOOL PEDAGOGY ON LAW STUDENT LEARNING STYLES

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ABSTRACT

Though the legal academy is a relative newcomer to the field, questions concerning law school pedagogy and law student learning styles have gained increasing traction among legal scholars in recent years. This article reports on the results of empirical research concerning the effects of the law school experience and of disparate pedagogical approaches on law student learning styles.

In what appears to be the first research of its kind in a law school context, the article reports the results of a longitudinal assessment of law student learning styles, and documents a statistically significant shift in learning styles among first-year students over the course of their first academic year. Though not conclusive, the research findings further suggest that classroom pedagogy may influence the development of law students’ analytical skills.

The author believes that experiential learning theory may hold a key to reaching students whose learning styles are not an ideal fit for the demands of a legal education. Having demonstrated through this and previous research that learning styles may be relevant to law school success, the author recommends additional study to further assess the effect of an experiential teaching approach in enhancing the learning proficiencies conducive to legal analysis.
TEACHING LIKE LAWYERS: WHAT EMPirical RESEARCH CAN TELL US ABOUT THE EFFECT OF LAW SCHOOL PEDAGOGY ON LAW STUDENT LEARNING STYLES

Eric A. DeGroff*

I. INTRODUCTION

This article was written in preparation for a recent panel discussion regarding the use of empirical research in informing law school pedagogy.1 Organizers of the panel correctly noted that legal education “lags behind other disciplines in the development of scholarship, and particularly empirical scholarship, about teaching, assessment and student learning.”2 Empirical research on teaching and learning styles began to attract a following in other educational fields over forty years ago,3 and the pace of that research

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* Professor, Regent University School of Law; J.D., Regent University School of Law; M.P.A., University of Southern California; B.A., University of Kansas. I would like to thank Professor Kathleen McKee, whose partnership in this research was critical to the project’s success. Significant credit for helping design and implement the research belongs to her; any shortcomings in the presentation are mine alone. I would also like to thank my colleague Eric Welsh for his invaluable assistance with my literature search, and Dr. Elisabeth Suarez, of the Regent University School of Psychology and Counseling, for the time she devoted to statistical analysis and for serving as a sounding board for our ideas. I also thank Professor Russ Weaver and the Southeastern Association of Law Schools for the forum they provided to discuss the issue of empirical research and law school teaching. Finally, I am grateful to Regent University for funding this research and to HayResources, Inc. for making the Kolb Learning Style Inventory available for our use.

1 Southeastern Association of Law Schools (SEALS) Annual Conference, The Value of Empirical Research in Law School Pedagogy, and Methods for Pursuing Such Research (July 31, 2010). This article presents the results of a study that was designed as a follow-up to an earlier round of research published in 2006, demonstrating that there are particular ways in which a large majority of successful law students appear to think and learn. See Eric A. DeGroff & Kathleen A. McKee, “Learning” Like Lawyers: Addressing the Differences in Law Student Learning Styles, 2006 B.Y.U. EDUC & L.J. 499.

2 Program notes for the SEALS Panel on Empirical Research and Law School Pedagogy (July 2010).

has accelerated dramatically in the last decade. Only recently, however, has this area of inquiry attracted much attention among legal scholars.

Remarkably, even though the legal academy is a relative newcomer to empirical research on teaching and learning, considerable progress has been made. On the basis of scholarship reported over just the last twenty years, legal educators have found: (1) that scores on the Law School Admission Test (LSAT) are valid predictors of students’ success both in law school and on the bar exam; and (2) that the learning styles of law

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school applicants may significantly affect their success on the LSAT and, thus, their likelihood of admission. They have also noted: (1) that students admitted to law school today bring with them a substantially greater diversity of styles and approaches to learning than was true of law students several decades ago, but (2) that the personality types and learning styles of today’s law students may significantly affect their chances of academic success once admitted. Significant as these findings are, they reflect the existing research only at the most general level. Legal scholars have also made praiseworthy efforts to determine specifically what works best in terms of curricular...
design,\(^\text{11}\) the use of technology in the classroom,\(^\text{12}\) the promotion of active learning,\(^\text{13}\) instruction in legal writing and analysis,\(^\text{14}\) teaching methodology in substantive courses,\(^\text{15}\) academic success programs,\(^\text{16}\) assessment of academic performance,\(^\text{17}\) converting law school performance into employment opportunities,\(^\text{18}\) and even the professional development of law school faculty.\(^\text{19}\) Though progress in most of these areas has been modest, research such as this has made it possible to begin evaluating and reassessing long-held assumptions regarding law school pedagogy.\(^\text{20}\)


\(^{13}\) See, e.g., Kate E. Bloch, *Cognition and Star Trek: Learning and Legal Education*, J. MARSHALL L. REV. 959, 968-82 (2009) (discussing empirical studies both in law schools and in other academic settings demonstrating the value of active learning).


\(^{20}\) Legal historians generally agree that, from the time of Dean Langdell’s introduction of the case method at Harvard Law School in the 1870s, education in the American law school classroom has focused largely on the techniques of case analysis, the use of Socratic dialogue, and an emphasis on the skills of advocacy or adversarial lawyering. A review of more recent literature, however, reflects a reassessment of these traditional teaching techniques. *See, e.g.*, Jacobson, *supra*. note 9, at 164 n. 98 (suggesting that the ‘traditional heuristic for reasoning by analogy (IRAC) is not helpful for many students because what constitutes ‘application’ is uncertain and because it does not model analogistic reasoning”); see also J. T. Dillon, *Paper Chase and the Socratic Method of Teaching Law*, 30 J. LEG. EDUC. 528 (1980).
It was within the context of this growing body of scholarship that our panel discussed the capacity of empirical research to enhance law school teaching. The research addressed in this article and considered during a portion of the panel discussion focused specifically on the impact of the first-year law school experience on law student learning styles, and on the comparative effects of disparate teaching methodologies in shaping the law school experience.

II. LAW STUDENT LEARNING STYLES

A. Flexibility of Adult Learning Styles

The term “learning style” has been defined in a variety of ways, with no one definition fully capturing the concept.21 Perhaps the best description is that a learning style represents an individual’s “preferred way of thinking, processing, and understanding information.”22 The concept encompasses both (1) the differing ways in which individuals perceive and absorb new information (i.e. the process of cognition, or the acquisition of knowledge), and (2) the disparate ways in which individuals process and catalog new information (i.e., the process of conceptualization, in which new connections are formed and new ideas are conceived).23

Learning styles have been “heavily researched” by scholars from a broad array of graduate and undergraduate programs24 and, as noted above, the issue has begun

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21 Scholars may define the term either broadly or narrowly, depending upon which aspect of the learning process they are considering. See DeGroff & McKee, supra. note 1, at 509, n. 47, and the references cited therein.
22 Buket Akkoyunlu & Meryem Yilmaz Soylu, supra. note 4, at 184.
23 See Kim Buch & Susan Bartley, Learning Style and Training Delivery Mode Preference, J. WORKPLACE LEARNING 5, 6 (2002) (defining “learning style” as the way in which people “take information in and how they transform the information into meaning”).
increasingly to resonate among legal scholars.\textsuperscript{25} There is general agreement in the literature that individuals differ significantly in the ways in which they tend to gather and absorb new information, and in how they process such information and relate it to what they already know.\textsuperscript{26} There is also substantial agreement that these differences in learning styles may have consequences for how successfully adult learners perform in various educational environments.\textsuperscript{27}

Scholars do not agree, however, on every aspect of the issue. One of the key distinctions among learning style theorists is the extent to which they view learning preferences as stable, or fixed.\textsuperscript{28} Some suggest that learning styles are “hard wired” genetically and are therefore subject to minimal, if any, change – particularly in adult learners.\textsuperscript{29} Others believe that, while adult learning preferences may be relatively stable, learning styles reflect some degree of both “nature and nurture”\textsuperscript{30} and thus are flexible to

\textsuperscript{25} See, e.g., Paula M. Young, \textit{Bibliography of Books and Articles on Active Learning and other Techniques for Teaching Law}, \textit{____________} (2008), which contains an extensive list of books and articles on learning styles and multiple intelligences.


\textsuperscript{28} Penger, Tekavcic & Dimovski, \textit{supra} note 24, at 4.

\textsuperscript{29} Id.

\textsuperscript{30} Reese & Reese, \textit{supra} note 9, at 181 (“[l]earning style is a combination of nature and nurture which may change with age and experience”). \textit{See also} Charalampos Mainmelis, Richard Boyatzis & David Kolb, \textit{Learning Styles and Adaptive Flexibility: Testing Experiential Theory} (Sage Publications 2002) (students can choose which set of learning abilities to use in specific learning environments); Martin Delahoussaye, \textit{The Perfect Learner: An Expert Debate on Learning Styles}, \textit{TRAINING} 4 (Proquest Educational Journals, May 2002 (people may choose to “play to their strengths” and limit their learning situations to those compatible with those strengths, or “work to become better all-around learners”); Jacobson, \textit{supra}. note 9, at 146 (agreeing that learning styles are susceptible to change); Loo, \textit{supra}. note 4, at 350 (suggesting that “[t]he effective learner . . . can use each of the four styles effectively . . . rather than relying upon their preferred style”).
an extent that varies among individuals. Those who view adult learning styles as malleable suggest that they may be influenced by the learner’s experience and by exposure to new learning environments or demands. Both the Kolb Learning Style Inventory (LSI) and Honey & Mumford’s learning style instrument – two of the learning style assessment tools used most widely in academic settings -- are predicated on the theory that learning styles are flexible at least to a degree.

B. Use of the Kolb Learning Style Inventory

Of the more than two dozen diagnostic instruments that have been developed by educational researchers since the 1960s, the LSI was selected for this study because of its generally widespread acceptance and its focus on the cognitive aspects of the learning process. Originally published by David Kolb in 1976, the LSI was designed to assess a number of personal traits including learning styles and approaches to problem solving.

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31 See, e.g., Alice Y. Kolb & David A. Kolb, Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education 15, 21 (unpublished ms. 2002) (hereinafter “Learning Spaces”) (copy on file with the author). See also Alice Y. Kolb and David A. Kolb, THE KOLB LEARNING STYLE INVENTORY – VERSION 3.1: 2005 TECHNICAL SPECIFICATIONS 10, 16 (hereinafter “Technical Specifications”) (learning style is “not . . . a fixed trait, but . . . a dynamic state” that may be influenced by numerous factors including one’s academic or professional environment). As a reflection of his belief in the dynamic nature of learning styles, David Kolb has designed a specific instrument – the Adaptive Style Inventory – to measure the extent to which learners adapt their learning styles in response to different learning environments.

32 Penger, Tekavcic & Dimovski, supra note 24, at 4 (discussing differences in learning style theories).

33 Id. at 8.

34 The LSI is not without detractors. See, e.g., Robin K. Henson & Dae-Yeop Hwang, Variability and Prediction of Measurement Error in Kolb’s Learning Style Inventory Scores: A Reliability Generalization Study, 62 EDUC. & PSYCH. MEASUREMENT 712 (2002) (critiquing the validity and reliability of the LSI and questioning its ipsative format). However, Kolb recognized certain shortcomings in the original version of the instrument and made substantial modifications in 1985. All subsequent versions have been used extensively and generally have been well-accepted. See, e.g., Thomas F. Hawk & Anit J. Shah, Using Learning Style Instruments to Enhance Student Learning, 5 DECISION SCIENCES J. INNOVATIVE EDUC. 1, 13 (2007) (discussing the merits of five of the leading learning style instruments and their uses in educational research, and finding that there is “solid support” for instrument validity and reliability with the LSI). See also Hong Lu, Lei Jia, Shu-hong Gong & Bruce Clark, supra note 4, at 188 (concluding that the revised LSI is a “well-accepted instrument” for educators and researchers); D. Christopher Kayes, Internal Validity and Reliability of Kolb’s Learning Style Inventory Version 3 (1999), 20 J. BUSINESS & PSYCH. 249 (2005) (reporting that both his and prior research “largely support[] the internal reliability” of the LSI).

Other instruments that have been used in a law school setting include the Myers-Briggs Type Indicator (MBTI), the Productivity Environmental Preference Survey (PEPS), and the learning style instruments developed by both Dunn & Dunn and Honey & Mumford.
The instrument was revised in 1985 to address concerns identified in early critiques. The format and design were modified again – though without substantive change – in 1999, and the instrument has been enhanced from time to time since then. The version used for the present research was the most recent iteration – the LSI 3.1 – which was published in 2005.\textsuperscript{35}

The LSI reflects the view that learning styles encompass preferences, or personal tendencies, for both information acquisition and information processing. Responses by subjects completing the LSI are scored, and the scores are plotted on $x$ and $y$ axes that represent personal preferences with respect to both of those aspects of the learning process.\textsuperscript{36} The $y$ axis measures preferences for information acquisition in terms of polar opposites – concrete experience (CE) versus abstract conceptualization (AC).\textsuperscript{37} The $x$ axis measures preferences or traits with respect to cataloguing and translating the subject’s experience into learning in terms that are also polar opposites – reflective observation (RO), or watching and listening, versus the testing of implications through active experimentation (AE).\textsuperscript{38} The polar opposites on the $x$ and $y$ axes (RO, CE, AC and AE) are referred to by Kolb as “learning modes,”\textsuperscript{39} or “learning orientations.”\textsuperscript{40}

\begin{thebibliography}{99}
\bibitem{35}The LSI 3.1 is identical to the LSI 3 -- which was used by the author in an earlier round of research -- but version 3.1 contains new charts reflecting scoring norms based on a sample of users that is larger, more diverse, and reportedly more representative of the general population than were any of the previous versions.
\bibitem{36}David A. Kolb, KOLB LEARNING STYLE INVENTORY: LSI WORKBOOK VERSION 3.1 (HayGroup, 2007).
\bibitem{37}David A. Kolb, FACILITATOR’S GUIDE TO LEARNING 14 (HayGroup, 2000).
\bibitem{38}Id.
\bibitem{39}Kolb, supra note 36, at 4. The author’s findings, both in this round of research and in his earlier research on law student learning styles, has found that “learning mode” may, in some instances, be a more powerful predictor of academic performance in law school than “learning style.” See infra nn. ___ - ___ and accompanying text.
\bibitem{40}Kolb & Kolb, Technical Specifications, supra note 31, at 12.
\end{thebibliography}
The four learning styles, as shown in Chart 1 above, are therefore determined according to the subject’s indicated preferences regarding both information acquisition and information processing. The learning styles are designated as Diverging, Assimilating, Converging, and Accommodating. Commentators sometimes refer to the four learning styles in terms of “quadrants,” which reflect spatially the location of each learning style on the schematic shown above. Beginning with the upper right-hand

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41 Kolb, supra note 36, at 5 (as modified by the author). Copyright 2007 Experience Based Learning Systems, Inc. All rights reserved. Reprint permission requests must be made in writing to the publisher, HayGroup, 116 Huntington Avenue, Boston, MA 02116.

42 Id. at 11.
quadrant, commentators either number the quadrants sequentially in clockwise order\textsuperscript{43} or refer to them as though they were points on a compass.\textsuperscript{44} Thus, the learning styles and quadrants compare as follows: Quadrant 1 (northeast) = Diverging; Quadrant 2 (southeast) = Assimilating; Quadrant 3 (southwest) = Converging; and Quadrant 4 (northwest) = Accommodating.

Each of the four learning styles has unique strengths and weaknesses with respect to particular academic cultures and demands, and each appears to be uniquely compatible with a distinct range of teaching techniques. Students with learning styles in the “southern” quadrants, who share a propensity for abstract thinking, tend to thrive in a learning environment that emphasizes logical, sequential reasoning and focuses on analytical constructs. Assimilators, for example (Quadrant 2 – southeast section), exhibit a preference for logical and abstract thought, reflective observation, and the development of theories and ideas.\textsuperscript{45} The term “assimilator” is a reflection of their relative skill at “assimilating knowledge into an integrated whole from separate pieces of information.”\textsuperscript{46} They are typically effective at understanding and formulating abstract concepts,\textsuperscript{47} and they tend to be detail-oriented, methodical, deliberate and analytical.\textsuperscript{48} In formal learning situations, they typically prefer “readings, lectures, exploring analytical models, and having time to think things through.”\textsuperscript{49} They “will work in groups if assigned,” but

\textsuperscript{44} See, e.g., Kolb & Kolb, Learning Spaces, supra note 31, at 12-14.
\textsuperscript{45} See generally Kolb, supra note 31.
\textsuperscript{46} Julie E. Sharp, Learning Styles and Technical Communication: Improving Communication and Teamwork Skills 2 (undated manuscript from the Department of Chemical Engineering, Vanderbilt University) (on file with the author).
\textsuperscript{47} Kolb & Kolb, Technical Specifications, supra note 31, at 5.
\textsuperscript{48} Sharp, supra, note 45, at 3.
\textsuperscript{49} Kolb & Kolb, Learning Spaces, supra note 31, at 11.
generally “prefer working alone.” Among the professional groups most often represented by Assimilators are those related to science and math, as well as the legal profession.

Students who are more comfortable with the Converging style (Quadrant 3 – southwest section) rely primarily on the learning strengths of abstract conceptualization and active experimentation. The term “converger” reflects their propensity to “converge quickly to make a decision” or “obtain one correct answer.” Those who exhibit this style are typically skilled problem-solvers and decision-makers and tend to place an emphasis on practical uses for ideas. In formal learning situations, Convergers tend to be less cerebral than Assimilators, often preferring active experimentation, simulation or laboratory assignments as a means of applying newly acquired information in a practical way. Professions typically associated with the Converging learning style include medicine, engineering and the applied sciences.

Students whose learning styles fall in the “northern” quadrants tend to be visual or global thinkers who may be more adept than others at seeing the “big picture,” but less proficient than those whose learning styles are in the southern quadrants at working sequentially through a theoretical framework. Divergers, for example (Quadrant 1 – northeast section), reflect personal preferences for concrete experience and reflective observation. They are generally strong in the areas of imaginative thinking and feeling,
Divergers typically learn by listening and sharing, and tend to be creative thinkers. Their learning style is labeled “Diverging” because they tend to view situations or problems from divergent perspectives and perform well in situations requiring the generation of ideas. Divergers typically have “broad cultural interests” and tend to specialize in the arts. In formal learning situations, Divergers tend to enjoy working in groups and brainstorming to generate a range of ideas.

Accommodators (Quadrant 4 – northwest section) enjoy strengths in the areas of concrete experience and active experimentation. The accommodating learning style is so named because those who prefer it tend to be skilled at “accommodating or adapting knowledge to new situations.” Those who exhibit this style tend to be experimenters who are effective in developing and implementing plans. Accommodaters typically prefer “hands-on” learning experiences, and in formal learning situations tend to be verbal learners who enjoy working with others to complete a project. Professions most often associated with the Accommodating learning style include management, marketing and human resources.

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58 Sharp, supra note 45, at 2.
59 Id.
60 Kolb & Kolb, Learning Spaces, supra note 31, at 11.
61 Kolb & Kolb, Technical Specifications, supra note 31, at 5.
62 Kolb, supra note 36, at 10-11; Sharp, supra note 45, at 2.
63 Kolb, supra note 36, at 9.
64 Sharp, supra note 45, at 3.
65 Kolb & Kolb, Technical Specifications, supra note 31, at 5.
66 Id.
67 Kolb, supra note 36, at 20.
C. The Learning Cycle and Experiential Learning Theory

The schematic in Chart 1 reflects two distinct elements, or “underlying assumptions”, of Kolb’s learning style theory. The first element comprises Kolb’s concept of the learning process, or learning cycle, itself. Kolb has theorized that there are four stages to the learning process, each represented by one of the learning modes. Together, the four learning stages encompass both the absorption of new information and the processing and cataloguing of that information. A learning experience may begin with any of the four stages, but Kolb and others have asserted that learning is most effective when it ultimately involves the student in all four phases of the cycle. Thus, the ideal learning process would include: (1) an experience that exposes the learner to a new concept or new information (as reflected in the northern axis on Chart 1 – “Concrete Experience”); (2) subsequent reflection upon, or review of, that experience in order to better understand it (as reflected in the eastern axis – “Reflective Observation”); (3) drawing conclusions about the experience and properly cataloguing it along with prior knowledge or experiences (represented by the southern axis – “Abstract Conceptualization”); and (4) doing something with the experience, such as planning the

68 Susan M. Montgomery & Linda N. Groat, CENTER FOR RESEARCH ON LEARNING AND TEACHING, U. MICH., Student Learning Styles and Their Implications for Teaching, 10 CRLT OCCASIONAL PAPERS 1, 3 (1998).
69 See infra, chart 1.
71 See David A. Kolb, FACILITATOR’S GUIDE TO LEARNING 13-16 (HayGroup, 2000); Kolb & Kolb, Learning Spaces, supra note 31, at 6. See also David A. Kolb, THE KOLB LEARNING STYLE INVENTORY. VERSION 3 4 (HayGroup, 1999) (asserting that a “well-rounded learning process” is one that “cycle[s] through all phases”), and M.H. Sam Jacobson, supra note 9, at 172 (suggesting that a truly strong learner would “master the entire learning cycle”).
next step or applying what was learned in a problem-solving context (depicted by the western axis – “Active Experimentation”).

The second foundational element, or assumption, of Kolb’s learning theory pertains to his conception of learner adaptability, and to the curricular and pedagogical techniques that he believes tend to promote such adaptability. Although each learner is likely to feel most comfortable with one of the four learning modes, Kolb theorizes that even adult students are capable of becoming “more proficient” with aspects of the learning cycle which they do not naturally prefer. Their adaptability to new learning modes may be enhanced, however, if they are first introduced to new constructs in a way that comports with their learning preferences. Kolb therefore suggests that one of the keys to promoting growth and flexibility in adult learning styles is for the instructor to facilitate an initial connection with new material by presenting it in a manner “consistent with [the students’] learning preferences.” Once presented with material in a way they can comprehend with relative ease, students can follow the sequence of the learning cycle as they process the same material in different ways through exercises that require the use of multiple learning modes and facilitate a deeper understanding of the subject.

Ultimately, according to Kolb, students can become more proficient in the full range of learning skills and thus become more balanced, sophisticated learners if they are able to make an initial connection with material in a manner consistent with their learning preferences.

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72 See, e.g., Kolb, supra note 36, at 5.
73 See, e.g., Montgomery & Groat, supra note 68 (citations omitted).
74 Kolb describes learning style as a “dynamic state,” but acknowledges that “individuals vary in their ability to move about the learning space from their home region.” Kolb & Kolb, Learning Spaces, supra note 31, at 15, 21.
75 Id. at “Applications.”
styles. Thus, Kolb suggests that it is most effective to design curriculum and conduct the classroom “so that there is some way for learners of every learning style to engage with the topic.” When curricular design and classroom instruction encompass the entire learning cycle, “every type of learner has an initial way to connect with the material and then begin to stretch his learning capability in other learning modes.” These principles are fundamental to what Kolb calls experiential learning.

D. Learning Styles, the LSAT, and First-Year Law School Performance

The study described on the following pages was designed as a follow-up to earlier research that had assessed the learning styles of students who were newly admitted to the first year of law school. In our previous study, Professor Kathleen McKee and I had found that approximately three-fourths of our first-year law school class reflected either a Converging or Assimilating learning style, thus placing them in the southern two quadrants – or the “southern hemisphere” -- of the Kolb schematic. The predominance of students with learning styles in the southern hemisphere reflected a substantial preference for abstract conceptualization as a means of connecting with new academic material.

77 Id.
78 Id.
79 Id.
80 The experiential learning theory commonly associated with Kolb was actually based on the work of cognitive and learning theorists including Bloom, Mezirow, Freire and a number of other scholars. Kolb, however, refined the cyclical concept of learning by distinguishing the acts of perceiving and processing as distinct aspects of that cycle. For a more thorough explanation of the Experiential Learning Theory and its historical development, see Curtis Kelly, David Kolb, The Theory of Experiential Learning and ESL, 3 Internet TESL J., “Limitations of Kolb’s Theory and Inventory” (Sept. 1997), http://iteslj.org/Articles/Kelly-Experiential/.
81 See DeGroff & McKee, supra note 1.
82 Id. at 520-21 (assessing the learning styles of approximately 150 first-year law students).
83 As noted in our previous article, these results were consistent with those of Professors John and Tania Reese, at the University of Denver, who also reported a three-to-one ratio of Assimilators and Convergers to Accommodators and Divergers. See Reese & Reese, supra note 9, at 177.
Our previous research had also found statistically significant correlations among learning styles or learning modes, LSAT scores, and academic performance in the first year of law school.84 Students whose learning styles reflected a low preference for abstract conceptualization (AC) tended to have relatively low LSAT scores and also tended to perform marginally in their first-year courses. A high propensity for abstract conceptualization did not guarantee academic success, but low AC scores were associated with low LSAT scores and low first-year grades at a statistically significant rate. Those findings suggested that law students with a relatively low propensity for abstract thinking were statistically at-risk of performing poorly in law school and, we were concerned, might be more likely also to experience difficulty later with the bar exam.85

While the previous research suggested that at least a minimal proficiency with abstract conceptualization might be helpful in the study of law, it left unresolved the questions of whether and how such proficiency could be enhanced after a student was already admitted to the school. The current study was designed to follow up that research by assessing: (1) to what extent students entering law school with a low propensity for abstract thinking might acquire greater proficiency with that learning mode during the course of their legal study; and (2) whether classroom pedagogy would have any bearing upon the development of analytical thinking by our students.

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84 See generally DeGroff & McKee, supra note 1, at 521-31.
85 Id. at 547, n. 194. As indicated in our previous article, our limited testing of law school graduates who have failed the bar exam suggests that their learning preferences fall disproportionately in Quadrants One and Four (Accommodating and Diverging), both of which are relatively weak in the modality of abstract conceptualization. These observations suggest that failure by law students to adapt more fully to abstract learning modes may inhibit their performance on the bar exam – presuming, of course, that the graduates who were tested after-the-fact actually began their law school career with a preference for Quadrant One or Four learning styles.
III. RESEARCH DESIGN, METHODOLOGY AND FINDINGS

A. Research Design

The current study was designed to assess, through the use of correlation research, the nature and degree of change in learning styles among students during their first year of law school. It was also intended to observe whether differences in teaching styles would influence the direction and degree of that change. In designing our research, we hypothesized that: (1) the academic culture and demands of law school would lead to significant adjustments in the learning styles of law students over the course of their first year of study; and (2) the use of an experiential teaching approach by certain faculty members who taught in the first-year curriculum would likely influence the direction and degree of that change, possibly promoting a shift in the southerly direction toward a more analytical approach to learning.

B. Research Methodology

1. Student Participants

Subjects consisted of a sample of 149 first-year law students, which represented the entire entering class at our law school in the fall semester, 2007. Participants consisted of 69 females (46.3%) and 80 males (53.7%). In terms of ethnicity, the population included 14 African-Americans (9.4%), 118 Caucasians (79.2%), 14 others.

86 An experiential approach to teaching is one that seeks to address the full learning cycle as described by Kolb and others and to connect in some way with students in each of the four learning style quadrants. An experiential approach does not necessarily require that teaching techniques compatible with each learning style be used during every class session, but an effort is made to incorporate a variety of pedagogical techniques at some point during the coverage of each significant area of the law. For a more thorough description and discussion of experiential teaching theory, see DeGroff & McKee, supra note 8, at 547-48.

One specific version of experiential teaching which has been applied in a number of academic environments and may hold promise in a law school context is called “4MAT”. For a description of that method and the results achieved, see Bernice McCarthy, The 4MAT System: Teaching to Learning Styles with Right/Left Mode Techniques, (EXCEL 1987); Bernice McCarthy, Using the 4MAT System to Bring Learning Styles to Schools, 48 EDUC. LEADERSHIP 31 (1990); Cynthia Kelly, Using 4MAT in Law School, 48 EDUC. LEADERSHIP 40 (1990).
(9.4%, primarily Hispanic and Asian), and 3 unknown. Participants’ LSAT scores ranged from 144 to 165.

2. **Faculty Participants**

Four faculty members who taught first-year courses during the 2007-2008 academic year were involved in the study, in the sense that their classes were observed and the learning styles of students in their sections were tracked. Of those four, two faculty members (referred to hereinafter as Professors X and Y) were familiar with experiential learning theory and had incorporated aspects of that theory into their teaching. Professor X, who taught one of the substantive first-year courses, devoted a number of class periods during the fall and spring semesters to simulations that entailed group discussions, brainstorming, and a modeling of the problem-solving process beginning with a summary of a fictitious client interview and concluding with an analysis of the relevant legal issues. The professor provided scaffolding outlines before each class period throughout the year to help direct the students in preparing for class discussions, provide a sense of context for each day’s assignment, and serve as a model for students in organizing their own course material. He incorporated a required analytical writing assignment and a number of optional writing assignments during the fall semester and provided individual feedback on those assignments to students who chose to make appointments with him to discuss the exercises. He also devoted time throughout the year to modeling the analytical process for the class by walking the students through analyses of various issues, thereby breaking down the analytical process through class discussion and feedback.
Professor Y, who taught a first-year Civil Procedure section, specifically discussed the learning process with his students at the beginning of the academic year and explained how his students’ class preparation could enhance that process. He provided considerable context for his course material; modeled the analytical process for his students; made extensive use of maps, diagrams and other visual aids; provided opportunities for small group exercises; and assigned written exercises to enable his students to experience the pleading process in a concrete way. A number of the techniques used by both of these professors – visual aids, written exercises, case studies or “lab exercises,” small-group discussions, brainstorming and immediate feedback from and interaction with the instructor -- are consistent with an experiential teaching approach and were used by the professors as a means of connecting with visual and other non-traditional learners.87

The two other professors who taught the same courses as Professors X and Y were rigorous instructors who had been widely recognized at the school for their teaching excellence, but were more Socratic in their approach. Given the differences in teaching styles between the two pairs of professors who happened to be teaching those subjects that year, we felt that we had a unique opportunity to assess to what extent, if any, the incorporation of experiential learning principles by Professors X and Y would influence the learning styles of students in their sections.

87 Professor Sam Jacobson and others have noted the increasing prevalence of visually-oriented students and passive learners among today’s law school population, making them quite unlike the law school classes of previous generations. A number of legal scholars have documented and discussed the academic challenges such students face in the traditional law school classroom. See, e.g., Jacobson, supra note 9 at 140, 144-45; Michael L. Richmond, supra note 9, at 944; Craig Anthony Arnold, How Do Law Students Really Learn? Problem-Solving, Modern Pragmatism, and Property Law, 22 SEATTLE U. L. REV. 891, 891 (1999).
3. Distribution of Study Participants

Except for the Legal Research, Analysis and Writing classes, where sections are relatively small, first-year courses at our law school are double-sectioned, with approximately 70-80 students per class. Incoming students are actually divided into four sections, with each professor being assigned two of the four sections. Because the four sections are combined differently in each course, during the year in question Professors X and Y had one section of students in common, while each had one section of students that the other did not teach. Accordingly, of the first-year students at the law school during our study period, one fourth had Professor X but not Y (referred to hereinafter as “Section X”), one-fourth had Professor Y but not X (referred to subsequently as “Section Y”), one-fourth had both Professors X and Y (“Section X+Y”), and one-fourth had neither (referred to hereinafter as the “control group”).

4. Administration of the Learning Style Instrument

Subjects were administered both a Pre-Test LSI questionnaire before the beginning of the fall semester and a Post-Test LSI questionnaire during the final week of the spring semester. Students who participated in the law school’s summer academic success program before the fall semester of their 1L year were given the Pre-Test questionnaire at the beginning of the first summer session, before any substantive instruction was provided. Those who were not involved in the summer program completed the Pre-Test questionnaire during the new student orientation period before fall semester classes began. The Pre-Test questionnaire was administered at these times in order to ensure that no student had received any sort of law school instruction before completing the assessment. The Post-Test questionnaire was administered in the
students’ Legal Research, Analysis and Writing classes during the final week of school in the spring semester, 2008.  

5.  Data Collection and Quantitative Methods

In addition to respondents’ Pre-Test and Post-Test scores on the LSI 3.1, data were collected from student admission files concerning respondents’ race or ethnicity, gender, and LSAT scores. Respondents were also categorized as being students of Professor X, Professor Y, both Professors X and Y, or neither. At the end of each semester, grades were collected from the Law School Records and Registration Office and recorded for each subject. A correlation design was used to: (1) determine the predictive value of LSAT scores, learning styles, and learning modes with respect to first-year grade point averages; (2) assess the correlation between learning styles or learning modes and LSAT scores; (3) assess the degree and direction of change in learning styles and learning modes over the course of the first year of law school as measured by the Pre-Test versus Post-Test learning style scores; and (4) assess the relationship between the direction and degree of change in learning styles or learning modes and the identity of

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88 Response rates, unfortunately, were less than 100 percent. Of the 149 admitted students for whom LSAT scores were available, there were 143 valid Pre-Test learning style scores. Students who were absent on the days the Pre-Test LSIs were administered received introduction and training with regard to legal analysis during the days immediately following, before the Pre-Test LSI could be administered to them. For the sake of consistency, they were not included in the Pre-Test sample. Of the 149 students admitted for the fall semester, 11 either left the program or were academically dismissed before the end of the academic year. Of the remaining 138 students, a number were absent from class on the days the Post-Test LSIs were given, and the follow-up response rate from those students was not high. Accordingly, the population for whom valid Post-Test LSI scores were available consisted of 109 students.

89 No significant correlation was found between gender and GPA or gender and learning style. With regard to LSAT scores, however, men scored significantly higher than did women in this particular law school class [F (1,147) = 8.084, p = .005 sig.]. As to ethnicity, the sample population of minority students was insufficient to provide meaningful comparisons.

90 See infra notes 94 and 98-100, and accompanying text.

91 See infra notes 95-97 and accompanying text.

92 See infra notes 101-112 and accompanying text.
the participants’ professors: (1) Professor X; (2) Professor Y; (3) both X and Y; or (4) neither X nor Y.\textsuperscript{93}

\textit{C. Research Findings}

\textit{I. Correlation Between Learning Styles, LSAT Scores and Law School Performance}

The results of this study were consistent with those of our previous research in a number of respects.\textsuperscript{94} First, Pre-Test data from this study reflected a 3:1 ratio of students who exhibited Converging or Assimilating learning styles as compared with those who demonstrated Accommodating or Diverging styles. This demonstrated a predominant preference among the first-year class for abstract thinking, as reflected in relatively high AC scores among the roughly 75 percent of the sample population whose learning styles were in the southern quadrants of the Kolb learning style schematic.\textsuperscript{95} Second, as was also true with our previous findings, subjects’ LSAT scores proved to be a statistically significant predictor of first-year GPAs.\textsuperscript{96}

Third, a statistically significant correlation was found between subjects’ learning modes, as indicated on the Pre-Test LSIs, and their LSAT scores. A high positive correlation existed between the subjects’ Pre-Test AC scores and LSAT scores, as shown in Chart 2 below.\textsuperscript{97} Significant, but less profound, negative correlations were also found between both CE and AE scores and the subjects’ LSAT scores.\textsuperscript{98}

\begin{itemize}
  \item \textsuperscript{93}See infra notes 113-115 and accompanying text.
  \item \textsuperscript{94}See DeGroff & McKee, supra note 1, at 519-532.
  \item \textsuperscript{95}Pre-test results were as follows:  N 143; Accommodators = 18 (12.6 percent); Divergers = 17 (11.9 percent); Convergers = 33 (23.1 percent); Assimilators = 75 (52.4 percent). The 75.5 percent of students with learning styles in the “southern” quadrants of the Kolb schematic was virtually identical to the 76.3 percent of students sampled in our previous study who exhibited Diverging or Assimilating learning styles.\textsuperscript{96} R(136) = .463, p < .01 (sig.).
  \item \textsuperscript{97}Correlation between LSAT and AC: r(107) = .401, p < .01 sig.
  \item \textsuperscript{98}Correlation between LSAT and CE: r(107) = -.206, p = .032 sig.; correlation between LSAT and AE: r(107) = -.201, p = .036 sig.
\end{itemize}
A correlation between LSAT scores and learning styles similar to that found in our previous research was also clearly noticeable, with the highest LSAT scores earned by subjects reflecting Diverging or Assimilating learning styles.\textsuperscript{99} Consistent with findings from our previous study, however, this correlation was not statistically significant when the four learning styles were considered individually.

Finally, data from the current study reflected a pattern almost identical to that of our previous study with respect to learning styles and academic performance in the first year of law school.\textsuperscript{100} Though the relationship was not statistically significant, students with a propensity toward the Converging and Assimilating learning styles (\textit{i.e.}, those in the southern hemisphere of the Kolb schematic) performed better, on the whole, than did

\textsuperscript{99} Assimilating, Pre-Test: M = 153.3333 (N=75); Converging, Pre-Test: M = 153.2727 (N=33); Diverging, Pre-Test: M = 151.0558 (N=17); Accommodating, Pre-Test: M = 149.2778 (N=18).

\textsuperscript{100} See DeGroff & McKee, supra note 1, at 527.
those with Diverging or Accommodating learning styles (see Chart 3 below).\textsuperscript{101} Data from the current study also reflected a noticeable – though not significant -- positive relationship between the subjects’ Pre-Test AC-CE scores (\textit{i.e.}, their location along the $y$ axis of the learning style schematic) and their first-year GPAs. (See Chart 4 below.

Chart 3: End-of-Year GPAs by Learning Style

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\textsuperscript{101} Converging: GPA = 2.82; Assimilating: GPA = 2.73; Diverging: GPA = 2.51; Accommodating: GPA = 2.49.
2. **Nature and Degree of Learning Style Shift in the First Year of Law School**

One of the primary purposes of the current study was to assess the degree of change in law student learning styles over the course of an academic year. To the best of our knowledge, no longitudinal analysis of learning styles had previously been done in a law school setting, though a number of such studies have been reported in other academic disciplines. In a variety of non-law school settings involving both graduate and undergraduate students, researchers have found that immersion in particular academic cultures can generate significant change in subjects’ learning styles. Indeed, the

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102 Though the end-of-year GPAs appear, in this chart, to trend upward in relation to higher AC-CE scores, the results were not sufficiently consistent to establish statistical significance.

learning styles of students in one undergraduate history class reportedly changed significantly over the course of a single semester when the students were exposed to an unusual pedagogical approach and an extremely demanding workload. Changes reported by other scholars generally have been less profound and typically have been assessed over a longer period; but a number of researchers have documented significant shifts in learning styles over the course of two to four years of study in particular professional fields or undergraduate majors. This phenomenon has been labeled by some authors as “learning style drift.”

As we planned our study and contemplated the likely results, we hypothesized that our students’ learning styles would shift noticeably over the course of their first year of study. That hypothesis proved to be accurate, though the direction of movement in the subjects’ learning styles was not anticipated. Knowing that the students would be engaged throughout their first year of study in learning the rudiments of legal analysis, we expected that their learning styles would move in a southerly direction to reflect a greater reliance upon, and proficiency with, abstract conceptualization. Instead, a

Geiger & E. J. Boyle, A Three Year Longitudinal Study of Changes in Student Learning Styles, 35 J. COLLEGE STUDENT DEV. 113 (Mar. 1994) (finding that the learning styles of college students were subject to change over time).


See, e.g., Kolb & Kolb, Learning Spaces, supra note 31. See also Stephen J. Cavanaugh, Kevin Hogan & Terenlall Ramgopal, The Assessment of Student Nurse Learning Styles Using the Kolb Learning Style Inventory, 15 NURSE EDUC. TODAY 177, 178 (1994) (finding that learning styles develop among nursing students “that reflect the special needs and learning demands of the discipline”).

See Tucker, supra note 101. See also Richard Tucker, Southern Drift: The Learning Styles of First- and Third-Year Students of the Built Environment, 50 ARCHITECTURAL SCIENCE REV. 246 (2007). Scholars are not entirely uniform in their use of the concept of statistical “drift.” The term is typically used in connection with research in which variables are measured on an ongoing basis (e.g., in the context of genetic research or market research), as opposed to single “before and after” comparisons. In the hope of clarity, and to distinguish the phenomenon observed in our research from the more widely-used concept of statistical “drift,” I have used the term “learning style shift” in this article to describe the Pre- and Post-Test changes in our subjects’ learning styles.
comparison of our subjects’ Pre-Test and Post-Test learning style scores reflected a statistically significant shift in a westerly direction (see Chart 5 below).\textsuperscript{108} Though the extent of the westerly shift was modest, the fact that a statistically significant change occurred over the course of only a single academic year was noteworthy.\textsuperscript{109} We further noted that roughly the same westerly shift occurred among students in all sections of the sample population, not only among those in Sections X, Y, or X+Y.\textsuperscript{110}

\textsuperscript{108} The subjects’ AE scores rose from an average of 32.0094 on the Pre-Test LSI to an average of 33.5377 on the Post-Test assessment. That movement was substantial enough to be considered statistically significant, though the level of significance was moderate to slight [t(105) = -2.909, p = .004]. A lesser shift in the southerly direction also occurred, as shown in Chart 5, but the extent of that shift was insufficient to prove statistically significant.

\textsuperscript{109} E-mail from Alice Y. Kolb, Adjunct Professor of Organizational Behavior, Case Western Reserve University, and President, Experience Based Learning Systems, Inc., to the author (July 16, 2010, 10:50AM EST) (on file with author) (noting that in most previous research, “significant changes do not normally occur until the end of the sophomore year”).

\textsuperscript{110} See infra Chart 6.
The cause of the population’s westerly shift was not entirely clear. A change in that direction among students of Professors X and Y alone might have been attributed to the prevalence of problem-solving exercises used in those classes. Convergers (those reflecting a southwesterly orientation) are said to have “a strong practical orientation”\textsuperscript{111}

and to be “generally deductive in their thinking.” Similarly, Accommodators (those reflecting a northwesterly bent) are said to “like doing things . . . in the here and now.”

A number of the experiential techniques used by Professors X and Y – case studies, group discussions, brainstorming and analytical modeling, for example – were specifically designed to promote students’ problem-solving skills. A westerly movement among those students would therefore not have been surprising. What is less clear is why subjects in all four sections experienced the same type of westerly shift. It appears from these data that immersion in the academic culture of a legal education in general may tend to promote a problem-solving orientation.

3. Influence of Teaching Styles on the Direction and Degree of Learning Style Shift

We had also hypothesized that differences in teaching styles between Professors X and Y, on the one hand, and their two faculty counterparts on the other, would influence the direction and degree of learning style change among our first-year students. Specifically, we expected that the sections taught by Professors X and Y might reflect a stronger southerly shift as a result of their more experiential teaching approach.

Our data did, in fact, reflect a modest trend in the expected direction and suggested that the differences in teaching styles may have influenced students’ learning styles somewhat, particularly among those whose Pre-Test LSIs indicated a low

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112 Id.
113 Id.
114 Id.

The fact that students’ average CE, RO and AC scores fell during the year does not necessarily suggest that the skill sets reflected by those learning modes were weakened. The LSI’s ipsative format, which has been debated extensively in the literature, naturally results in lower relative scores for other learning modes whenever the score of any particular learning mode increases. Thus, for example, an increased focus on practical problem solving could effect a reduction in a student’s AC score without necessarily reflecting a reduction in the student’s analytical skill or preference for an analytical approach to learning.
propensity for abstract thinking.\textsuperscript{115} The following findings all reflected a similar pattern. First, of the 105 students who completed both Pre-Test and Post-Test LSIs, thirty-five exhibited Accommodating or Diverging learning styles on their Pre-Test instruments, placing them in the northern hemisphere of the Kolb schematic at the beginning of the academic year.\textsuperscript{116} Of those thirty-five subjects, ten (29 percent) reflected Converging or Assimilating learning styles on their Post-Test LSIs, having apparently shifted, over the course of the year, into learning styles in the southern hemisphere. Of those ten students, five were in Section X, three in Section Y, and two in Section X+Y. No student in the control group exhibited a shift from a learning style in the northern hemisphere to one in the southern quadrants.

Second, while not statistically significant, there were slight differences among the four sections regarding changes in AC scores over the course of the year. Given the ipsative nature of the LSI, the significant increase in the average AE scores (which led to the westward shift among the sample population as a whole) was accompanied by overall reductions in the subjects’ average RO, CE, and AC scores.\textsuperscript{117} Accordingly, the average AC scores among students in three of the four sections declined over the course of the year. However, the average AC scores among students in Sections X and Y fell somewhat less than did those in the control group, and the AC scores among students in

\textsuperscript{115} An inherent and unavoidable limitation in the research design was the fact that teaching styles among the four faculty members involved were not totally disparate. Though Professors X and Y have been intentional in incorporating experiential techniques in their instruction, both employ Socratic methods in the classroom to a degree. Their counterparts, likewise, make use of lectures and visual aids, and are purposeful in their instruction regarding the dynamics of legal analysis. Thus, though their teaching styles differ significantly, none of the four are at either extreme of the Socratic spectrum.
\textsuperscript{116} See infra note 99 and accompanying text.
\textsuperscript{117} [Add scores.]
Section X+Y actually increased slightly between the Pre-Test and Post-Test assessments (see Chart 6 below).\footnote{Insert scores.}

Chart 6: Changes in average AC scores by Section

![Differences by AC Scores](chart.png)

Finally, the data reflected some distinction among the sections with respect to those students whose scores changed substantially over the year. Again, given the nature of the LSI and the possibility of test sensitization, modest shifts between Pre-Test and Post-Test scores were common among the test population in both directions along each axis.\footnote{Indeed, one of the key questions considered by both critics and supporters of the LSI has always been the instrument’s degree of test-retest reliability. See, e.g., Kayes, supra note 34 ( ); Henson & Hwang, supra note 34 ( ).} When limited, however, to subjects whose movement along the \(y\) axis equaled or exceeded five points from the first administration of the LSI to the second,\footnote{In determining what constituted a significant change in a subject’s learning style between Pre-Test and Post-Test administrations, there was no obvious cut-off point. Professor Alice Kolb herself has indicated that she is not aware of “any studies testing sensitization of the LSI on repeated administrations.” E-mail from Alice Y. Kolb to the author (July 24, 2006, 3:28 PM EST) (on file with the author). She noted, however, that “Sims 1991 test retest study . . . administered the LSI three times in 8 week[] intervals and found strong test- re-test reliability.” Id. We decided to use a cut-off of a 5 point shift along the \(y\) axis for this analysis on the basis that that number was roughly twice the standard deviation.} differences among the four sections were noticeable. Among students in either Section X or Y
whose AC-CE scores changed by five points or more, sixteen of twenty-eight (58 percent) shifted in a southerly direction.\(^1\) Among those in Section X+Y, eight of thirteen (62 percent) moved in a southerly direction. Among the control group, by contrast, a minority of such students (five of twelve, or 42 percent) shifted learning styles in a southerly direction.

Despite these trends, however, our hypothesis concerning the expected effect of differences in teaching styles was not confirmed. The disparities in direction and degree of learning style shift among the four sections, while consistent, were not statistically significant. There was no significant difference in change in AC-CE scores among the four sections,\(^1\) and no significant difference in change in AC scores themselves among the four sections.\(^1\)

**IV. CONCLUSIONS**

The results of this study were consistent with findings from our previous research in several respects. First, our Pre-Test data indicated that roughly three-fourths of the law school’s entering first-year class exhibited Converging or Assimilating learning styles, reflecting a relatively high propensity for abstract conceptualization as a preferred learning mode.\(^1\) Second, a statistically significant correlation was demonstrated between the subjects’ LSAT scores and their Pre-Test AC scores, suggesting a positive relationship between proficiency with abstract thinking and success on the LSAT. Third, though not statistically significant, our data again reflected that students whose learning styles fell within the southern hemisphere of the Kolb schematic performed better

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\(^1\) This percentage was precisely the same among students in Section X (#s) and in Section Y (#s).

\(^1\) \( F (4,101) = .564, \ p = .690 \ n. \ s. \)

\(^1\) \( F (4, 101) = .385, \ p = .819 \ n. \ s. \) *See infra* chart 6.

\(^1\) *See infra* Chart 1.
academically in their first year of law school than did those whose learning styles placed them in the northern quadrants.

The study also demonstrated -- for the first time, to the best of our knowledge -- a significant shift in learning styles among our first-year law students, as determined by a comparison of Pre-Test versus Post-Test LSI scores. The composite shift among the first-year class was primarily in a westerly direction, suggesting the development of a higher propensity among the sample population for active experimentation as a means of synthesizing new information and analytical constructs.

It remains undetermined, however, whether or to what degree differences in pedagogy may have influenced adjustments by the students in their learning styles. There was some evidence suggesting that an experiential teaching approach may have promoted a greater southerly shift within the sample population – particularly among students who began their law school career with relatively undeveloped analytical skills. If these findings are truly representative, they suggest that the use of an experiential approach in teaching first-year law students may have some salutary effect in developing and encouraging the use of law students’ abstract thinking skills. Conclusions, however, are difficult to draw from the data for a variety of reasons. First, the differences among the sections with respect to the students’ learning style adjustments were not statistically significant. Second, the sample sizes used for comparison were relatively small. Though the Pre-Test sample was reasonably large, the Post-Test sample was substantially smaller, and division of the reduced Post-Test sample into the four sections created

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125 N = 143.
126 N = 105. It is not clear what effect, if any, our failure to capture all first-year students in the Post-Test process may have had on our research findings.
very modest sample populations for comparison.\textsuperscript{127} Finally, the number of uncontrollable factors influencing the learning experience of first-year students made it difficult to isolate and evaluate the impact of the variables under examination. In addition to their professors in the two courses isolated for this study, the students were enrolled in a minimum of two other courses during the academic year, and most were enrolled in four additional courses.\textsuperscript{128} In those courses, the students had varying combinations of other professors whose teaching styles were not accounted for in this research. Even among the four faculty members observed in connection with this study, the differences in teaching styles were fundamentally a matter of degree. Professors X and Y do not avoid the Socratic method in their classes, but simply supplement it with selected experiential techniques. Nor do their counterparts rely upon the Socratic method exclusively; their classes also incorporate both lecture and instruction in problem-solving.\textsuperscript{129} Given the number of these and other uncontrolled variables, it may be remarkable, not that the research failed to demonstrate a statistically significant effect from the disparate pedagogical approaches, but that there were any discernible patterns at all.

With regard to the design and utility of empirical research in general, our study reinforced the need, in conducting such research, to ensure that the questions asked are appropriate and that the study design is workable. Professor Andrea Curcio has noted that empirical research tends to move in baby steps, and has suggested that an investigator should try to define his research question “as narrowly and precisely as

\textsuperscript{127} [Provide sample population for each section.]
\textsuperscript{128} [Differences accounted for by part-time versus full-time study.]
\textsuperscript{129} See infra note 115 and accompanying text.
We found that advice to be cogent. Our experience also affirmed the value of Professor Robin Boyle’s suggestion to conduct a pilot study, if possible, in preparation for a final research project. Through a pilot study we conducted in the year before implementing this research, we discovered two very important realities: first, that the academic intervention we had originally planned to assess was likely insufficient to promote any meaningful change in our students’ learning styles; and second, that the research design we initially intended to use was overly complex.

Finally, we note that the LSI used in this research has been utilized by Kolb and others concurrently with a related instrument called the Adaptive Style Inventory (“ASI”). The ASI was designed to measure the extent to which learners adapt their learning styles in response to different learning situations, and the instrument is reportedly useful in identifying and addressing subjects’ learning style flexibilities. It is possible that use of the LSI in conjunction with the ASI would yield a more accurate and complete assessment of learning style adjustments.

Despite the limitations of this research, it demonstrates that the law school environment can significantly affect the learning styles of those who engage in it; and while by no means conclusive, it provides some evidence that an experiential approach in the classroom may help enhance the development of law students’ analytical skills. Our

See Curcio, supra note 17, at 923. Her article in the 2009 edition of the Quinnipiac Law Review is an excellent reference for anyone interested in designing empirical research in a law school setting.

See Robin A. Boyle & Joanne Ingham, Suggestions on How to Conduct Empirical Research: A Behind-the-Scenes View, 15 PERSPECTIVES: TEACHING LEGAL RESEARCH & WRITING 176, 177 (2007) (noting that the authors themselves conducted a pilot study during the year before the classroom study described in their article, and suggesting that a pilot “may be very helpful in . . . fine-tuning [a contemplated] study”).


Id. at 11.

The ASI was developed by Kolb and Boyatzis in 1993. A brief description of the instrument can be found at http://www.haygroup.com/leadershipandtalentondemand/ourproducts/Item_Details.aspx?ItemID=23&type=7&t=2.
hope is that others will expand on this research in other law school settings, with the goal of helping us all further refine and enhance a law school pedagogy that maximizes opportunities for a new generation of students.