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Robin A. Boyle,* Karen Russo,** and Rose Frances Lefkowitz***

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I. INTRODUCTION

Do you have motivated students in your classes who prefer to learn independently? Given the diversity of learning styles in law school students,¹ you probably do! A Contract Activity Package (“CAP”)² allows this kind of student to work at his or her own pace. It also provides options for all students to learn through their various modalities—visual, auditory, tactual, and kinesthetic.

We conducted empirical studies at two different universities in law-related classes and found that both classes, as a whole, learned content better by using the CAP than by using traditional classroom instruction. One of those studies, by Robin Boyle and Karen Russo, involved incoming law students in Professor Boyle’s legal research and writing classes at St. John’s University School of Law (“Boyle and Russo study”).³ The Boyle and Russo study ascertained the

1. Robin A. Boyle and Dr. Rita Dunn, Professor and Director of the Center for the Study of Learning and Teaching Styles at St. John’s University, have been assessing the learning styles of first-year law students at St. John’s University School of Law since 1996 and have found, year after year, that law students have diverse learning-style strengths. For group summaries of learning-style preferences for the Boyle and Russo studies in academic years 2000-01 and in 2001-02, see *infra* app. A. Professor Boyle and researcher Lynne Dolle assessed the learning-style preferences of law students in academic year 1998-99 for a study involving Programmed Learning Sequence manuals. See Robin A. Boyle & Lynne Dolle, *Providing Structure to Law Students – Introducing the Programmed Learning Sequence as an Instructional Tool*, 8 LEGAL WRITING: J. OF LEGAL WRITING INST. ___ (forthcoming Spring 2003) (providing group summaries that indicate diverse learning styles). In the academic year 1997-98, Professor Boyle assessed the learning-style preferences of her law students so as to experiment with innovative classroom strategies. See Robin A. Boyle, *Bringing Learning-Style Instructional Strategies to Law Schools: You Be the Judge!*, in PRACTICAL APPROACHES TO USING LEARNING STYLES IN HIGHER EDUCATION 156, 160 (R. Dunn & S.A. Griggs eds., 2000) (providing group summaries that indicate diverse learning styles). Professor Boyle and Dr. Dunn first assessed the learning-style preferences of law students in their initial study in academic year 1996-97. See Robin A. Boyle & Rita Dunn, *Teaching Law Students Through Individual Learning Styles*, 62 ALB. L. REV. 213, apps. 2-3 (1998) (providing group summaries that indicate diverse learning styles).

2. The Contract Activity Package is fully explained *infra* Part IV. The Contract Activity Package (CAP) referred to throughout this Article is based upon the Dunn and Dunn model. See generally RITA DUNN & KENNETH DUNN, THE COMPLETE GUIDE TO THE LEARNING STYLES INSERVICE SYSTEM ch. 8 (1999) [hereinafter DUNN & DUNN, LEARNING STYLES INSERVICE].

3. Professor Boyle and researcher Russo performed empirical studies in legal research and writing classes at St. John’s University School of Law in two successive years.

students' learning styles and assessed the effectiveness of the CAP in comparison to traditional methods of legal research instruction. Similar to the results from prior years,⁴ the law school population was diverse in its learning styles.⁵ Law students performed significantly better on the CAP post-test than those who were taught by traditional instruction.⁶ The topic of the CAP was legal research.⁷ Our finding of diverse learning-style preferences was consistent with earlier studies that also revealed diversity among adult populations.⁸

The other study, by Professor Rose Lefkowitz, involved students taking health law classes ("Lefkowitz study").⁹ Like Boyle and Russo, Lefkowitz

In 2001, Professor Boyle and researcher Russo performed a pilot study in Prof. Boyle's legal research and writing classes; the findings from the pilot study were that the students learned significantly more when using the CAP than with the traditional methods ($p < .0001$). (A copy of the pilot study materials is on file at the Center for the Study of Learning and Teaching Styles, St. John's University.) In 2002, Professor Boyle and researcher Russo repeated the study with a new population by using the same CAP; the fact pattern for the overarching memorandum of law that the students were researching differed between the two studies. The 2002 study served as the basis for Russo's Ed. D. dissertation and is referred to in this Article as the "Boyle and Russo study." Karen Russo, Effect(s) of Traditional Versus Learning-Style Instructional Strategies on the Achievement and Attitudes of First-Year Law School Students in a Legal Research and Writing Course (2002) (unpublished Ed. D. dissertation, St. John's University) (on file with St. John's University). Dr. Russo's dissertation won the Dean's Award for Excellence in Research.

4. See *supra* note 1.

5. See *infra* app. A.

6. See *infra* Part V.B. & app. D.

7. The title of the CAP was "Legal Research: *An Appealing Subject!*"

8. See Carolyn Bovell, Analysis of the Learning Styles of Non-Traditional College Students and Implications for Effective Instruction (2000) (unpublished Ed. D. dissertation, St. John's University) (on file with St. John's University). Bovell studied "the preferred learning styles of older adults in non-traditional university programs," and found differences in preferences among certain elements. *Id.* at 5, 108-12. She recommended:

Professors should incorporate a variety of methodologies into their teaching because adult learners show significantly different preferences for the (a) environmental elements of sound, temperature, and design; (b) emotional elements of motivation, persistence, conformity and structure; (c) sociological elements of working alone and with an authority; and (d) physiological elements of perceptual preferences, intake, time of day, and mobility. Thus, no single strategy will be effective for all learners.

Id. at 112. See also Carolyn Bovell & George Ansalone, *An Exploration of Adult Learning Styles: Doesn't Everyone Learn Similarly?*, MICH. COMMUNITY C.J., Fall 2001, at 41, 41 (finding diversity of learning styles among adult students age 25-83 attending a metropolitan community college, as assessed by using the Productivity Environmental Preference Survey). See generally Kristin B. Gerdy, *Making the Connection: Learning Style Theory and the Legal Research Curriculum*, in 19 LEGAL REFERENCE SERVICES Q. No. 3/4, at 71 (2001) (discussing different learning-style models for teaching legal research).

9. Professor Lefkowitz conducted her study in health law classes at Downstate Medical Center and it formed the basis of her dissertation: Rose Frances Lefkowitz, *Effects*

found that her allied health students¹⁰ were similarly diverse in their learning styles.¹¹ Her students also performed significantly better on the CAP post-test than those who were taught by traditional instruction.¹² The Lefkowitz study included two CAPs—one on the topic of patient consent (“CAP One”)¹³ and the other on legislative responses to end-of-life issues, such as durable power of attorney and living wills (“CAP Two”).¹⁴

This Article offers methods, materials, and findings for use by other law professors wishing to experiment with non-traditional teaching techniques in law-related courses. Part II sets forth the learning-styles theory based upon the Dunn and Dunn Model, which was the basis for both the Boyle and Russo study and the Lefkowitz study. Part III summarizes experiences by other researchers and educators who have used CAPs. Part IV describes the CAP as a learning-style instructional strategy. In Part V, we present the designs of our two studies and the findings. Recommendations are provided in Part VI pertaining to the types of legal courses that would be appropriate for CAPs.

II. DUNN AND DUNN LEARNING-STYLES THEORY

If you absorbed your law professors’ lectures throughout law school and retained the information well enough to get good grades on exams, then you probably have auditory strengths. Consider yourself lucky because you are in the minority; it is likely that only thirty percent of your law school classmates absorbed the material well through lecture and discussion.¹⁵ If you learned in

of Traditional Versus Learning-Style Presentation of Course Content in Medical/Legal Issues in Health Care on the Achievement and Attitudes of College Students 2001 (unpublished Ed. D. dissertation, St. John’s University) (on file with St. John’s University). Dr. Lefkowitz received the Phi Delta Kappa Outstanding Doctoral Dissertation Award in 2002.

10. “Allied health professional” is defined as:

A health professional qualified by training and frequently by licensure to assist, facilitate, or complement the work of physicians, dentists, podiatrists, nurses, pharmacists, and other specialists in the health care system. For example, a specialist in blood bank technology and a [sic] emergency medical technician (EMT) are allied health professionals.

LEXIKON DICTIONARY OF HEALTH CARE TERMS, ORGANIZATIONS, AND ACRONYMS FOR THE ERA OF REFORM 36 (1994).

11. Lefkowitz, *supra* note 9, at 62-64.

12. *See infra* Part V.D. & app. E.

13. CAP One was called, “Patient Consent—To Touch or Not to Touch?” Lefkowitz, *supra* note 9, at app. G.

14. CAP Two was called, “End-of-Life Issues—Your Number is Up!” *Id.* at app. H.

15. *See* RITA DUNN & KENNETH DUNN, TEACHING SECONDARY STUDENTS THROUGH THEIR INDIVIDUAL LEARNING STYLES 402 (1993) [hereinafter DUNN & DUNN, TEACHING SECONDARY STUDENTS]. Researchers have found that students’ “retention of information is drastically improved when students become active” learners. Laurel L. Clouston & Mark H.

law school by reading cases, then you probably have visual strengths, like forty percent of any given adult population.¹⁶ Nevertheless, you probably remembered only seventy-five percent of what you read or saw.¹⁷ Law professors be advised—not all of your law students are learning effectively from your lectures, your materials, or from reading your assigned text, regardless of quality of content.

All students are entitled to a solid legal education regardless of their divergent learning-styles strengths.¹⁸ Drs. Rita Dunn and Kenneth Dunn describe four “perceptual preferences” that manifest when students must remember new and difficult information: “(1) hearing it (auditorially), (2) seeing it (visually), (3) handling manipulative instructional resources (tactually), and/or (4) actively participating while standing or moving (kinesthetically).”¹⁹ Some students can learn “through more than one modality,” but for most students one is “stronger than others.”²⁰ Students with tactual and kinesthetic strengths may be just as intelligent as those with

Kleinman, *Accommodating Learning Styles: New Ways of Teaching and Learning Chemistry*, CANADIAN CHEMICAL NEWS, Mar. 1998, at 15, 15. The inadequacies of straight lecture and studies on students’ low retention rates are explained in detail in a monograph. JOHN MCLEISH, *THE LECTURE METHOD* (1968).

16. See DUNN & DUNN, *TEACHING SECONDARY STUDENTS*, *supra* note 15, at 402.

17. See *id.*

18. Dunn and Dunn have found that “[r]evising classroom instruction to respond to the learning styles of diverse students has gained increased support during the past two decades.” RITA DUNN ET AL., *SYNTHESIS OF THE DUNN AND DUNN LEARNING-STYLE MODEL RESEARCH: ANALYSIS FROM A NEUROPSYCHOLOGICAL PERSPECTIVE I* (2001). The United States Center for Research in Education reported “that the Dunn and Dunn Learning-Style Model was one of very few programs that consistently increased achievement among our schools’ most unsuccessful students – those in Special Education.” *Id.*

Since the New York State Education Department, in conjunction with the state’s Board of Regents, increased the standards for high school students to graduate with a Regents diploma, Dunn and Dunn and other researchers have advocated that the Dunn and Dunn learning-style model will assist teachers and students in meeting the new standards. See generally N.Y. STATE ASS’N FOR SUPERVISION & CURRICULUM DEV., *IMPACT ON INSTRUCTIONAL IMPROVEMENT*, Spring 2000. Dr. Anthony Mello, Executive Director of NYSASCD and Editor of *IMPACT* wrote:

It is critical that we, the professionals, look carefully at the teaching learning process that will enhance success for all students rather than concentrate on teaching a test. All children deserve the opportunity to achieve and succeed. We must remember that as in all of life there are “*different strokes for different folks.*”

Id. at i.

Similarly, on the West Coast, a California state commission for educational reform recommended that “[l]earners should be able to choose from a system of multiple options in programs and learning styles.” RISE: REPORT OF THE CALIFORNIA COMMISSION FOR REFORM OF INTERMEDIATE AND SECONDARY EDUCATION 10 (1975).

19. DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 15.

20. *Id.*

auditory and visual strengths; they just learn differently. After the students experience new content via their strongest perceptual strengths, they should “reinforce[] [it] through their *secondary* or *tertiary* perceptual strength[s].”²¹

“[L]earning style is the way each person begins to concentrate on, process, internalize, and retain new and difficult academic information.”²² Drs. Rita and Kenneth Dunn have researched learning styles for over thirty years and have theorized that there are five types of stimuli that affect learning (environmental, emotional, sociological, physiological, and psychological), each of which includes multiple elements—twenty-one in all.²³ The concentration of strong preferences for some of these elements determines students’ learning styles.²⁴

Dunn and Dunn have found that five specific preferences can reveal whether students are generally “global” or “analytic” learners: light, design, sound, persistence, and the need for intake while concentrating.²⁵ Determination of learning style has value for the instructor because analytics learn sequentially, one fact after another, whereas, globals learn with an overview of the content and how it relates to them personally before they can focus on details and objectives.²⁶

III. OTHER RESEARCHERS’ AND EDUCATORS’ EXPERIENCES WITH CAPS

Professor Boyle and researcher Russo were the first to empirically study the use of a CAP in a law school class and Lefkowitz was the first to empirically study the use of a CAP in a medical center class. Previously, the effectiveness of CAPs as a teaching strategy was empirically studied in higher

21. *Id.*

22. *Id.* at 11.

23. *Id.* at 12. The five stimuli and their corresponding elements are: 1) environmental: sound, light, temperature, furniture design (soft chair versus straight back hard chair and desk); 2) emotional: motivation, persistence, responsibility, and structure; 3) sociological (describing with whom the students prefers to learn): self, pair, peers, team, working with an adult, varied; 4) physiological: perceptual, intake (measuring preference of snacking while concentrating), time of day (morning, afternoon, evening preferences), mobility; and 5) psychological: global versus analytic, hemisphericity (students utilizing right versus left side of brain), and impulsive versus reflective thought process. *Id.*

24. *See* DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 15. (“Most people have between six and fourteen preferences that constitute their learning style.”).

25. *See id.* at 20.

26. *See id.* at 39.

education courses for nursing,²⁷ anatomy and ultrasound,²⁸ and physician assistant courses²⁹ with generally positive results.

While the bulk of empirical studies indicate that the CAP is an effective teaching strategy for the intermediate and high school,³⁰ as well as primary

27. In separate studies, researchers have found that college nursing students demonstrated significantly higher grades and more positive attitudes toward assignments when their unique learning styles were addressed with a CAP. See Lauren E. O'Hare, *Learning Styles-Based Instruction: Eleven Steps over the Brick Wall*, in *LEARNING STYLES AND THE NURSING PROFESSION* 83, 92 (Rita Dunn & Shirley A. Griggs eds., 1998); Elizabeth A. Van Wynen, *Information Processing Styles: One Size Doesn't Fit All*, *NURSE EDUCATOR*, Sept./Oct. 1977, at 44, 45.

28. Joyce A. Miller & Rita Dunn, *The Use of Learning Styles in Sonography Education*, *J. DIAGNOSTIC MED. SONOGRAPHY*, Nov./Dec. 1997, at 304, 307 (finding that the CAP was effective for teaching topics of anatomy and ultrasound to college students).

29. See generally Dawn Morton-Rias, *What Does Style Have To Do with It? Practical Approaches in Accommodating Individual Learning Style in Physician Assistant Education*, *PERSP. ON PHYSICIAN ASSISTANT EDUC.*, Spring 1999, at 96, 96-98.

30. See Rita Dunn et al., *Grouping Students for Instruction: Effects of Learning Style on Achievement and Attitudes*, 130 *J. SOC. PSYCHOL.* 485, 489-91 (1990) (finding that middle-school students who prefer to learn alone, as well as students who expressed no preference for this element, achieved statistically higher achievement and attitude scores when they were matched with CAPs as a learning-alone treatment than when they were matched with learning-with-peers treatment); Jack Gremler, *Learning Sequenced Instruction on the Short and Long-Term Achievement of Seventh and Eighth-Grade General Music Students*, 11 *NAT'L F. OF TCHR. EDUC. J.* 63, 69 (2001-02) (finding "a significant difference in the learning-style preferences of the students who were most likely to achieve when matched with each teaching methodology" including those taught with a CAP); Paul Trautman, *An Investigation of the Relationship Between Selected Instructional Techniques and Identified Cognitive Style 1-2*, 62 (1979) (unpublished Ed. D. dissertation, St. John's University) (on file with St. John's University) (finding the CAP effective for teaching the psychology of graffiti to eighth grade students; specifically, "student achievement in knowledge, comprehension, and application was greater significantly when the instructional method was congruent with the diagnosed cognitive style"). In the Trautman study, the CAP was developed with objectives and activities for either global or analytic students. *Id.* at 2, 29. Trautman recommended, based upon his study's findings, "[b]ehavioral objectives and various instructional prescriptions, such as Contract Activity Packages, should be developed in each subject area to respond to the individual cognitive styles required to master those objectives." *Id.* at 64.

Another researcher who conducted a study with high school students in a health studies course, and who used instruments other than a CAP, found that students did significantly better on achievement tests when paired with an instructional method that was congruent to their preferences for high or low structure. See Rhoda K. Tanenbaum, *An Investigation of the Relationship(s) Between Selected Instructional Techniques and Identified Field Dependent and Field Independent Cognitive Styles as Evidenced Among High School Students Enrolled in Studies of Nutrition 69-70* (1982) (unpublished Ed. D. dissertation, St. John's University) (on file with Dissertation Abstracts Intl. 43, 68-01A).

levels,³¹ educators argue that the CAP can be effective at any grade level.³² In an empirical study with an adult population, researchers examined the learning styles of nurses and public school teachers, as assessed by the Productivity Environmental Preference Survey (“PEPS”), in an on-the-job training course.³³ The researchers found that “a compelling majority of learners in *both* samples [nurses and public school teachers] reported that perceptual modality is an important variable in their learning.”³⁴ “Perceptual modality” was defined as “[s]ensory intake mode,” which is “Limited to Visual, Auditory and Tactile, Kinesthetic as measured by the [PEPS].”³⁵ The researchers recommended “[i]nformation about perceptual modality preferences of participants in mandatory training should be collected and utilized by trainers in designing and delivering inservice sessions, because this factor has been found to be related to the learning productivity and satisfaction of the participants.”³⁶

IV. COMPONENTS OF THE CONTRACT ACTIVITY PACKAGE

The Contract Activity Package (“CAP”) is an effective “instructional

31. See Rita Stafford Dunn, *Individualizing Instruction Through Contracts – Does it Work with Very Young Children?* AUDIOVISUAL INSTRUCTION, Mar. 1971, at 78, 78-80 (finding that pre-kindergarten and pre-first grade youngsters performed successfully with individualized instruction through CAPs); Theresa Santano, *Effects of Contract Activity Packages on Social Studies Achievement of Gifted Students*, 23(1) J. SOC. STUD. RES. 3, 6 (1999) (finding that fourth-grade students performed better with the CAP than with traditional lessons).

32. See generally Rita Dunn, *Contract Activity Packages (CAPs): Teaching the Way Many Middle School Students Learn*, MICH. ELEMENTARY & MIDDLE SCH. PRINCIPALS’ J., Winter 1997, at 8, 8 (advocating the use of CAPs in middle schools); Rita Dunn & Jack Gremli, *Teaching Urban Students With Contract Activity Packages: Rap, Rock, and Ragtime—A Rational Approach*, 9 NAT’L F. TCHR. EDUC. J. 27, 28 (1998-99) (describing “how to use music as one way of making an urban curriculum relevant and motivating” by using a CAP as a teaching method); Andrea Honigsfeld, *Global Warming: It’s Not Cool! A Model for Creating Multisensory Instructional Packages*, SCI. & CHILD., Mar. 1999, at 46, 48-49 (advocating that teachers develop a CAP and other learning styles materials for third-through sixth-grade science classes).

33. Bill C.G. Buell & Nancy Atherton Buell, *Perceptual Modality Preference as a Variable in the Effectiveness of Continuing Education for Professionals* 66-74 (1987) (unpublished Ed. D. dissertation, School of Education, University of Southern California) (on file with University of Southern California Library).

34. *Id.* at 74. An interesting finding was that “[t]here was a statistically significant relationship between perceptual modality preference and satisfaction with the content, format and especially the presenter of an inservice session. This relationship was stronger for teachers than nurses.” *Id.* at 193.

35. *Id.* at 18-19.

36. *Id.* at 196-97.

strategy that allows motivated [students] to learn at their own speed.”³⁷ The CAP is ideal for those students who are assessed by the PEPS as “nonconformists.”³⁸ Students can work with the CAP “either alone, with another participant or two, or as part of a team through small group activities that are included.”³⁹ Students can also work with the CAP at any time of day, which maximizes the students’ capacity “for concentrating and producing.”⁴⁰ Because students can work independently with the CAP, they “may adjust for light, temperature, and design to match their learning style characteristics for those elements.”⁴¹ A well-designed CAP is more than a self-paced assignment because it has four critical features that help students learn through their respective perceptual preferences and provide reinforcement of course content.⁴²

First, the CAP provides “[s]imply stated objectives”⁴³ of a particular lesson plan.⁴⁴ Approximately three to five objectives are optimal depending upon content, age, and students’ ability. Within each objective, students are provided choices of activities that span all of the perceptual preferences;⁴⁵ these are called “Activity Alternatives.”⁴⁶ The professor may require that students

37. DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 85.

38. *See id.* at 88 (“CAPs are most effective with *independent* and *motivated* participants because they provide self-pacing for individuals who want to achieve, improve, or be among the best in their field.”); Rose Frances Lefkowitz, *Using Contract Activity Packages: A CAP-ital Idea!*, in *PRACTICAL APPROACHES TO INDIVIDUALIZING STAFF DEVELOPMENT FOR ADULTS* 87, 99 (Rita Dunn & Kenneth Dunn eds., 1998).

39. Lefkowitz, *supra* note 38, at 99.

40. *Id.*

41. *Id.*

42. *See generally* DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 98-99 (identifying “Special Guidelines for Perfecting a CAP”).

43. *Id.* at 85.

44. For example, in the Boyle and Russo study, Objective One stated: “Identify and have a general working knowledge of *primary authority*.” Russo, *supra* note 3, at app. A. In the Lefkowitz study, Objective Two stated: “Describe the following five (5) legislative responses to end-of-life issues: (a) Patient Self-Determination Act; (b) Substituted Judgment/Guardianship; (c) Durable Power of Attorney; (d) Health Care Proxy; and (e) Living Will.” Lefkowitz, *supra* note 9, at app. H; *see infra* apps. B & C for samples of Objectives and Activities for both studies.

45. DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 85 (describing a CAP as including “[m]ultisensory resources that permit choices of materials that match individuals’ perceptual preferences”).

46. *Id.* (defining “Activity Alternatives” as activities “in which adults apply newly mastered information by creating original resources to show that they have learned what was required or selected”). For example, in the Boyle and Russo study, choices of Activity Alternatives for Objective One were:

1. Design a traditional crossword puzzle on the topic of primary authority. Include a definition of primary authority and at least two sources of primary

engage in a particular activity to ensure that they learn material in a certain way.⁴⁷ The professor may also choose whether the students perform the Activity Alternatives in or outside the classroom.⁴⁸

Second, the CAP requires students to share the work that they produced with other students—this process is called “Reporting Alternatives.”⁴⁹ By reporting to others, students reinforce and retain the information while simultaneously reinforcing the same information to which their classmates were exposed.⁵⁰ It is within the professor’s discretion to determine the reporting method and the number of classmates to whom the report will be made.⁵¹ CAPs

authority. [Appealing to students with visual and tactual preferences.]

2. Construct an outline of a lecture that you would give to law school students on primary authority. [Appealing to students with visual and tactual preferences.]
3. Create an audio tour of the St. John’s Law Library by using a cassette tape and recorder. Focus the tour on primary authority. Explain where the resources are located for a law student or lawyer who wished to look up cases and statutes. [Appealing to students with kinesthetic and auditory preferences.]

Russo, *supra* note 3, at app. A. In the Lefkowitz study, choices of Activity Alternatives for Objective Two were:

1. Make an audiotape depicting the following scenario: You are a judge describing to a jury what the five (5) legislative responses to end-of-life issues mean.
2. Create a game of “Who Wants to Be a Millionaire?” answering questions on at least five (5) legislative responses to end-of-life issues.
3. Design a multi-colored poster illustrating at least five (5) legislative response to end-of-life issues.

Lefkowitz, *supra* note 9, at app. H.

47. For example, the Boyle and Russo study mandated that students complete the following activity for Objective One: “In your own words, write a definition of ‘primary authority’ and give two examples.” Russo, *supra* note 3, at app. A. This activity appeals to visual and tactual students. *Id.* Professor Boyle required this particular activity because it demanded that her students learn the essence of the objective. *See generally id.* at 23, 46. The Lefkowitz study did not require students to do any particular activity. Lefkowitz, *supra* note 9, at app. G.

48. *See generally* DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 88.

49. *See id.* at 85 (explaining that the purpose of “Reporting Alternatives” is to share the completed Activity Alternatives with “others in the workshop”).

50. *Id.* at 93.

51. In the Boyle and Russo study, students performed the activities outside of class, but reported to other students inside the classroom on a scheduled day. Russo, *supra* note 3, at 48, app. A. In small groups, students reported on such tactual materials as puzzles and task cards. *Id.* at app. A. For activities about which students would feel competitive, students reported directly to Professor Boyle privately about what they had accomplished (for example, students reported privately to Prof. Boyle regarding legal cases and other authorities for the overarching memorandum of law assignment). *Id.* In the Lefkowitz study, students performed both the activities and the reporting in class on the same day. *See* Lefkowitz, *supra* note 9, at 49. “Reporting Alternatives” in the Lefkowitz study ranged from reporting to small groups of six students to displaying their work to the entire class by mounting a poster. *Id.* at app.

specify certain “Reporting Alternatives” with “Activity Alternatives” as a matched pair—and these pairs cannot be separated unless a student requests a change.⁵² It is also within the professor’s discretion to determine whether students report inside or outside the classroom.⁵³

Third, the CAP includes “[a]t least three small-group techniques”⁵⁴ that are to be performed in the classroom. Dunn and Dunn have created three small-group exercises designed for students to reinforce material presented in CAPs: Team Learning,⁵⁵ Circle of Knowledge,⁵⁶ and Brainstorming.⁵⁷ Some of the advantages of small-group techniques include: “interaction” among classmates amounting to an increase in “productivity,”⁵⁸ “stimulating debate,”⁵⁹ “[f]ocus and intensity are targeted toward one task at a time,”⁶⁰ and “[c]reativity and innovation are more likely to result from the challenge of questions and tasks posed to the group.”⁶¹ All of the small group techniques are given a short time limit enforced by the professor.⁶²

Team Learning is “a small-group strategy used to *introduce* new information.”⁶³ Students should form teams of approximately four or five participants and select one student to record the answers to the questions.⁶⁴ In Team Learning, each group member reads a passage selected by his or her professor.⁶⁵ The team is first asked to answer simple factual questions, and then to tackle ones requiring a “higher order [of] thinking”⁶⁶ whereby “analysis

H.

52. In the Boyle and Russo study, Professor Boyle willingly let students create an “Activity” that was not listed in the CAP if it sounded feasible. *See generally* Russo, *supra* note 3, at 46. However, all students reported their activity in class on a certain date. *See id.* at 48.

53. *See generally* DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 88 (stating that students “demonstrate mastery of the inservice requirements *their way*”).

54. *Id.* at 85 (explaining that the small-group techniques “permit persons who enjoy working or learning with colleagues to do so”).

55. *See id.* at 50.

56. *See id.* at 52.

57. *See id.* at 54.

58. DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 49.

59. *Id.*

60. *Id.*

61. *Id.*

62. *See generally id.* at 46-56 (describing the small group techniques used for inservice workshops).

63. DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 96.

64. *Id.* at 50.

65. *See id.*

66. *Id.*

or inference should be posed.”⁶⁷ Questions should be written “to challenge the group to reason from the [passage], to form opinions, and to reach decisions through consensus, if possible.”⁶⁸ The final question(s) should demand that the group apply the material creatively in forms such as “[p]oetry, raps, television scripts, role playing, drawings, tactual games, and so forth”⁶⁹ Both the Boyle and Russo⁷⁰ and the Lefkowitz study⁷¹ included Team Learning.

Another small group technique, Circle of Knowledge, “[r]einforce[s] the information in the Team Learning.”⁷² This technique is performed with four or five participants.⁷³ Circles of teams are spaced throughout the room.⁷⁴ The professor poses “[a] single question or problem”⁷⁵ and gives all participants a short time frame to complete the task, generally a few minutes.⁷⁶ Within each circle and in order, each participant orally states an answer to the question or problem.⁷⁷ A designated participant acts as the recorder.⁷⁸ In this way, everyone participates. At “time,” the professor asks questions of each circle, in a certain ordered sequence and one at a time.⁷⁹ Correct answers are

67. *Id.*

68. DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 50.

69. *Id.*

70. In the Boyle & Russo study, the Team Learning strategy included a passage written by Professor Boyle describing the difference between primary and secondary authority and an overview of federal and state court systems. Russo, *supra* note 3, at app. A. A factual question asked about the purpose of secondary authority; an inferential question asked what role the courts play in determining the law. *Id.* Finally, students were asked to creatively apply the information by devising a research plan for a hypothetical legal question. *Id.*

71. In the Lefkowitz study, there were two CAPs and, therefore, two Team Learning strategies. Lefkowitz, *supra* note 9, at 48. In CAP One, students were given written descriptions of various types of patient consent, such as written informed consent and oral informed consent. *Id.* at app. G. Factual questions asked about the various types of consent; an inferential question asked students to describe a situation in absence of patient’s consent. *Id.* The creative question asked students to “[w]rite a script of a hospital nurse committing a battery on a patient.” *Id.* In CAP Two, students were asked to read “five (5) legislative responses to end-of-life issues,” such as a description of a durable power of attorney. *Id.* at app. H. Factual questions asked students about the five responses; an inferential question asked students the difference between a Living Will and health care proxy. *Id.* A creative question asked students to “[r]ole play a scenario in which an elderly mother discusses her health care wishes with her daughter and wants to execute a Living Will.” *Id.*

72. DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 96.

73. *Id.* at 52.

74. *Id.*

75. *Id.*

76. *Id.*

77. DUNN & DUNN, LEARNING STYLES INSERVICE, *supra* note 2, at 52.

78. *See id.*

79. *Id.*

tabulated; incorrect answers are subtracted.⁸⁰ The professor uses an overhead transparency or a blackboard to tabulate team scores.⁸¹ Teams may challenge answers provided by other teams.⁸² Both the Boyle and Russo study⁸³ and the Lefkowitz study⁸⁴ used Circle of Knowledge.

Brainstorming, a third small-group technique, “releases creative energy and aids in planning and in solving problems.”⁸⁵ Five to ten participants form a semicircle around a recorder who has large sheets of paper and a marker, a blackboard, or an overhead projector.⁸⁶ The professor asks the group “to develop multiple answers to a single question, alternative solutions to problems, and creative responses.”⁸⁷ The recorder may not editorialize or comment on the responses.⁸⁸ The Boyle and Russo study included “Brainstorming.”⁸⁹

Professors may use other small-group techniques, such as having students work on task forces or research committees.⁹⁰ Role Playing can also be used “to encourage creativity through dramatization and to allow kinesthetic participants to move while learning.”⁹¹ The Lefkowitz study included case studies/group analysis.⁹² According to Dunn and Dunn, “case stud[ies] stimulate[] and help[] to develop analytical skills.”⁹³ With this technique, the professor provides students with a written case study.⁹⁴ Working within small groups, students are expected to produce a written short story or an audio or

80. *Id.* at 53.

81. *Id.* at 52–53 (providing further details on how to use Circle of Knowledge).

82. DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 53.

83. In the Boyle and Russo study, students were asked: “List as many sources of both secondary and primary authority, as well as finding tools, for researching a common law question concerning federal law.” Russo, *supra* note 3, at app. A.

84. In the Lefkowitz study, students in CAP One were asked to “identify as many of the ten (10) elements of an *informed consent* as you can.” Lefkowitz, *supra* note 9, at app. G. In CAP Two of the Lefkowitz study, students were asked to: “identify as many components of the Do-Not-Resuscitate (DNR) Orders as you can.” *Id.* at app. H.

85. DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 56.

86. *Id.* at 54.

87. *Id.*

88. *Id.*

89. In the Boyle and Russo study, the Brainstorming question was: “There are many legal print resources that contain information to answer a statutory question concerning New York law. Name as many as you can in two (2) minutes.” Russo, *supra* note 3, at app. A.

90. DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 56.

91. *Id.* at 96.

92. In the Lefkowitz study, CAPs One and Two contained the following small-group technique: It provided a short legal case on the subject of each CAP and asked students to answer questions about the cases. Lefkowitz, *supra* note 9, at apps. G & H.

93. DUNN & DUNN, *TEACHING SECONDARY STUDENTS*, *supra* note 15, at 138.

94. *See generally id.*

video tape about a single event—either “[actual] or fictional.”⁹⁵ Students work with questions either supplied by the professor or developed by the students to reach conclusions to new situations.⁹⁶

A fourth feature that the CAP provides is a list of multisensory resources that students may use to accomplish its objectives;⁹⁷ students’ use of these resources are independent of professorial instruction. This list should include “tactual/visual and kinesthetic/visual resources” for students to use and master the material and to perform the Activity Alternatives of the CAP.⁹⁸ The professor could make the resources accessible to students by leaving them at the school library or by creating a resource room.⁹⁹ The Boyle and Russo study included a multisensory resource list that included not only legal research texts, but also Programmed Learning Sequence manuals that were designed for visual/tactual students.¹⁰⁰ The Lefkowitz study included extensive lists of multisensory resources including textbooks, journal articles, equipment, such as tape recorders and camcorders, and tactual/kinesthetic materials, such as floor games.¹⁰¹

The final stage of a CAP includes a post-test to assess the students’ mastery of the subject matter.¹⁰² To measure the difference between what students knew prior to the CAP and after the CAP, the professor may give students the same test as the pre-test. Our studies show that students learned significantly more when using the CAP than the traditional methods.¹⁰³

V. THE DESIGNS AND FINDINGS OF THE TWO STUDIES

The two studies were designed differently, yet both yielded excellent results. In the Boyle and Russo study, which was conducted in the Spring of

95. *Id.*

96. *Id.* at 138-39.

97. *See* DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 94, 96.

98. *Id.* at 96.

99. *See generally id.* (inferring that materials should be made available to those choosing to complete the CAP objectives).

100. *See* Boyle & Dolle, *supra* note 1, at 4-5, 12-17 (providing a general description of a Programmed Learning Sequence and detailing the ones used in a particular study); Russo, *supra* note 3, at app. A. The multisensory list for the Boyle and Russo study also included professional videotapes on the topic of legal research that were made available at the law school’s library. *See id.*

101. Lefkowitz, *supra* note 9, at apps. G & H.

102. *See* DUNN & DUNN, *LEARNING STYLES INSERVICE*, *supra* note 2, at 85.

103. *See infra* Part V & apps. D-E.

2002, students took pre-tests and post-tests¹⁰⁴ to measure their knowledge of the subject matter. In the Lefkowitz study, which was conducted in the Fall of 2000, students took four post-tests.¹⁰⁵ The results of both tests were analyzed by statisticians who participated in the design of the studies.¹⁰⁶ Students also took the PEPS to ascertain their learning-style preferences.¹⁰⁷ As required for all experiments on human subjects, students in both studies gave informed consent.¹⁰⁸

A. *Design of the Boyle and Russo Study*

The goal of the Boyle and Russo study was to compare the effectiveness of the CAP with the traditional method of teaching legal research. The CAP was given to one section (“Experimental”) of legal research and writing students.¹⁰⁹ Another section (“Traditional”) of legal research and writing students received a traditional take-home assignment called a “Traditional Research Protocol.”¹¹⁰ The Experimental Section did not prepare the Activity

104. In the Boyle and Russo study, the pre-tests and post-tests were professor-constructed and were identical to each other. Russo, *supra* note 3, at 46. Both sections were given the same tests. *Id.* The pre-tests were given in the first class when legal research was introduced. *See id.* at 48. The post-tests were given three-and-a-half weeks later when the Experimental Section presented their Reporting Activities in class and when the Traditional Section handed in their Traditional Research Protocol. *Id.*

105. Lefkowitz, *supra* note 9, at 47 (explaining that “the assumption was that the material covered was completely unknown to the students, the use of a pre-test was considered unnecessary”). Each post-test, which “evaluate[d] the content taught for that session, was administered right after the presentation whether taught traditionally or by CAP.” *Id.*

106. For the Boyle and Russo study, Professor Boyle developed a rubric for scoring the pre-tests and post-tests; she obtained the assistance of a statistician in developing the rubric. Russo, *supra* note 3, at 48 & app. F. Law Teaching Assistants (upper-class students) used the rubric to score the tests, which were given anonymous numbers in lieu of the subjects’ names. In Lefkowitz’s study, Professor Lefkowitz scored the tests. *See* Lefkowitz, *supra* note 9, at 47. For both studies, statisticians reviewed the results and provided statistical analyses. *See infra* apps. D & E.

107. *See infra* app. A (charting PEPS results and explaining the test); Lefkowitz, *supra* note 9, at 44-46 (describing PEPS).

108. The Institutional Review Board (“IRB”) at St. John’s University approved of the Boyle and Russo study conducted with the St. John’s law students. Law students were given a letter explaining the study; students’ consent was indicated by their signature. The IRB at St. John’s University and at Downstate Medical Center approved the Lefkowitz study; the allied health students also gave written consent after being informed of the study.

109. The Experimental Section contained nineteen participants. *See* Russo, *supra* note 3, at 60.

110. The Traditional Section contained twenty-five participants. *See id.* (containing Traditional Research Protocol). The statistician who analyzed the data explained that the statistical significance was so strong that the small size of the number of subjects was not of

Alternatives in class, but they did the Reporting Alternatives in class.¹¹¹

Professor Boyle taught both sections—Experimental and Traditional.¹¹² There were three ninety-minute class lectures to both sections; the lectures and written materials distributed in the classroom pertaining to the lectures were identical for both sections, with the exception of small-group techniques¹¹³ being conducted in the Experimental Section for half of one class period. Thus, the primary difference between the two sections was that a CAP was given to one section for those students to do at home and a Traditional Research Protocol was given to the other section to do at home.¹¹⁴

A jury pool determined that the Traditional Research Protocol contained similar content to the CAP.¹¹⁵ Both the CAP and the Traditional Research Protocol asked students to research primary and secondary authority and to provide cases and statutes relevant to a particular legal issue.¹¹⁶ The overarching legal question posed was the same for both sections.¹¹⁷ Each section had the same amount of time to complete their assignment.¹¹⁸

B. Findings in the Boyle and Russo Study

The findings of the Boyle and Russo study were that students' knowledge significantly increased by using the CAP, whereas students' knowledge increased only modestly when using traditional methods.¹¹⁹ The Boyle and Russo study achieved statistical significance at the $p < .001$ level.¹²⁰ A result of this magnitude might occur by chance approximately one in a thousand

concern, and, therefore, he did not need to add "power" to obtain results.

111. *Id.* at app. A.

112. *See id.* at 59.

113. *See supra* Part IV (describing small-group techniques).

114. Russo, *supra* note 3, at 48.

115. The jury pool consisted of researchers and educators in the fields of education and law. *Id.* at 47 & app. D.

116. *Id.* at apps. A & B.

117. The overarching legal question and fact pattern were based upon a fictional criminal case of an irate car driver who physically picked up another motorist and dropped her to the ground, injuring her ankle. The students in both sections were asked to research the same question - whether the victim suffered a "physical injury" according to the New York Penal Law's definition of that term. An example of a question from the Traditional Research Protocol was: "Are there any periodicals that are useful on this topic? Take a look in the Index to Legal Periodicals. Then skim a few legal journal pieces. If you find useful materials, record the name and a brief explanation of what you found." Boyle & Russo, *supra* note 3, at app. B.

118. *See* Russo, *supra* note 3, at 48.

119. *See infra* app. D.

120. *See infra* app. D.

times.¹²¹

C. Design of the Lefkowitz Study

Two CAPs were assigned to allied health students in an urban college of health-related professions.¹²² CAP One covered patients' rights to consent to medical treatment and CAP Two concerned legislative responses to end-of-life issues.¹²³ A pool of jurors reviewed each CAP "to ascertain that the content and materials of all units were of equal difficulty and appropriate."¹²⁴

The Lefkowitz study "followed a counterbalanced repeated measure design."¹²⁵ The sequence of traditional and CAP instruction was as follows:

Class #1 was presented with a traditional unit first, followed by presentation with a CAP method. The same class was again exposed to a different traditional unit and then followed by a different CAP. Class #2 was presented with the CAP method first, then followed with traditional instruction. The same class was presented with material by another CAP and then with a traditional instruction. Class #3 followed the same alternating pattern starting with the traditional instruction followed by the CAP method and then provided material traditionally followed by the CAP approach. Class #4 was presented information with the CAP method first, then followed by a traditional presentation. This same group of students received another CAP method of instruction followed by a traditional presentation.¹²⁶

Class	Alternating Pattern of Treatments			
Class 1	T1	C2	T3	C4

121. See *infra* app. D.

122. Lefkowitz, *supra* note 9, at 44 (describing the participants as totaling eighty-six).

123. *Id.* at 48 (providing names of CAPs).

124. *Id.* at 47 & app. D.

125. *Id.* at 61.

126. *Id.* Note that in the Boyle & Russo study, the two different groups of students met at different times over the span of a couple of weeks; each group was referred to as a "section." See Russo, *supra* note 3, at 48. In contrast, in the Lefkowitz study there was one group of students who met for four class sessions, each of the four sessions was referred to as a "class." See Lefkowitz, *supra* note 9, at 61.

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Class 2	C2	T1	C4	T3
Class 3	T1	C2	T3	C4
Class 4	C2	T1	C4	T3

Counterbalanced Repeated Measures Design

Note. T1 represents the first traditional treatment; C2 represents the first CAP treatment; T3 represents the second traditional treatment; and C4 represents the second CAP treatment.

A significant difference between the Boyle and Russo study and the Lefkowitz study is that in the former, students developed the Activity Alternatives outside the classroom.¹²⁷ In the Lefkowitz study, during the CAP portion of the unit, students developed the Activity Alternatives and the Reporting Alternatives within the same class period in the classroom.¹²⁸ Professor Lefkowitz then post-tested the students at the end of each class period.¹²⁹

D. Findings of the Lefkowitz Study

The findings of the Lefkowitz study were that the CAP method of instruction, as measured by the student mean-achievement scores, “was significantly ($p < .0001$) more beneficial for the students than the traditional method.”¹³⁰ Furthermore, the students who received the CAP method of instruction demonstrated a significantly ($p < .0001$) higher student mean in an attitude assessment than those with the traditional method of instruction.¹³¹ Results of this magnitude might occur by chance approximately one in ten

127. See Russo, *supra* note 3, at 48.

128. For CAP One, in Objective 3, which stated “[i]dentify the circumstances in which minors can, and cannot, give consent for medical and surgical treatment,” students could select from the Activity Alternatives to prepare a speech, design a poster, or role-play a scenario. Lefkowitz, *supra* note 9, at app. G For CAP Two, in Objective 3, which stated “[i]dentify all the components of Do-Not-Resuscitate (DNR) Orders,” students could select from the Activity Alternatives to prepare a speech, role-play, or create a videotape. *Id.* at app. H.

129. *Id.* at 49.

130. *Id.* at ii; see *infra* app. E.

131. Lefkowitz, *supra* note 9, at ii. The Semantic Differential Scale was used, which “measured students’ attitudes comparing the different instructional methodologies they experienced.” *Id.* at i-ii; see also *id.* at 55 tbl. 4.

thousand times.

In terms of individual learning styles of the students, as correlated with the findings of the study, Lefkowitz found “[s]tudents who performed well with the CAP were significantly more non-conforming than those who performed well traditionally.”¹³² This finding has been documented in previous studies where the effectiveness of CAPs were measured.¹³³

VI. RECOMMENDATIONS

We found that the CAP was an effective strategy for teaching legal research to law students and for teaching health law to allied health college students. Our recommendation is that professors in colleges and law schools experiment with CAPs in law-related courses. The CAP would be ideal for a lesson plan that encourages students to work independently of their professors’ instruction. So long as a Resource Alternatives List can be constructed, the CAP would permit students to teach themselves. For example, a CAP could be designed for use in teaching students about intentional torts, such as false imprisonment or battery. Locating materials from the Multisensory Resource List, students could read about assigned torts in textbooks and articles, or listen to a description of them on auditory tapes. In the Boyle and Russo study, students also learned the material by lecture and visual aids, the same presentations were made to both the traditional and experimental sections.¹³⁴ Depending on the variety of tasks provided in the Activity Alternatives of the CAP, students could create task cards and word puzzles, act out a screenplay, or find an unlimited number of creative ways to demonstrate their knowledge. A CAP could also be designed to teach other topics such as examinations before trial or jury selection procedures.

On the other hand, a CAP may not be suitable for course material that is extremely difficult and requires a professor’s help in parsing the detail. If students could become easily confused by attempting to teach themselves the general concepts, then select a different lesson plan. For example, the topic of

132. *Id.* at ii.

133. *See* Dunn & Gremler, *supra* note 32, at 29 (stating that CAPs are beneficial for students who are motivated to achieve better grades, motivated out of interest in the topic, and/or prefer to learn alone or with a friend or two); Van Wynen, *supra* note 27, at 48 (“CAPs work well with students who are motivated, auditory, and nonconforming, as well as for those of varied academic levels who are either average, above-average, or gifted students.”). In Van Wynen’s study, students selected activities based upon their individual Productivity Environmental Preference Survey printouts and, therefore, decidedly worked alone or with others. *Id.* at 48-49.

134. Russo, *supra* note 3.

negligence or the Rule Against Perpetuities may be too broad and complex for a CAP for all students. It would be worthwhile, however, to experiment with a CAP involving broad and complex subjects by providing it to those ideally suited for CAPs – those who are motivated, persistent, prefer to learn alone, and who have auditory or visual strengths.

One caveat with respect to designing a CAP for an adult population: some of the Activity Alternatives may seem unusual for a college or law school classroom. For example, suggesting to students that they use their hands and creatively construct task cards initially may feel uncomfortable for the professor. However, in our experience, as students progress through the process of developing visual, tactual, kinesthetic, and auditory materials, they become increasingly enthusiastic about learning, and their professors' fears will dissipate over time. In our classrooms, students appeared exuberant about doing something out of the ordinary and about learning from the experience.¹³⁵

135. Some of the comments from the law students in the Boyle and Russo study were:

- *I felt it was an interesting experience where learning was made easier without feeling as though I was doing work.*
- *The CAP was a nice way to reinforce and clarify the knowledge we gained in class. It was a good way to internalize information.*
- *The CAP provides a great method of learning the material.*
- *It was a fun and interesting deviation from the usual/traditional lectures and readings. A good change from the 'norm'.*
- *I found making the CAP helpful, but I found sharing our CAPs with each other even more helpful. This project definitely exceeded my expectations.*

(students' comments on file with Professor Boyle at St. John's University School of Law).

Some of the comments from the allied health students in the Lefkowitz study were:

- *It was a great way of teaching—that got the students involved—a great way to help us remember what we've learned!*
- *Not boring; can learn information different ways without just memorizing lists.*
- *Fun and easy to remember the material.*

Lefkowitz, *supra* note 9, at 64.

APPENDIX A – TABLE 1

PRODUCTIVITY ENVIRONMENTAL PREFERENCE SURVEY:
 REPRESENTATIVE CLASS PROFILE OF ST. JOHN'S UNIVERSITY
 LAW STUDENTS – 2002
 (Profile Assessed for Dissertation Study)

Distributions of Opposite – Preferences and Strong Preferences
 for Learning Style Elements
 Group Summary

PEPS ELEMENTS	% OPPOSITE PREFERENCE <39	% STRONG PREFERENCE >60
NOISE LEVEL	2.3	4.6
LIGHT	11.4	11.4
TEMPERATURE	18.1	13.6
DESIGN	11.4	13.6
MOTIVATION	11.4	6.8
PERSISTENCE	4.6	9.1
RESPONSIBILITY	20.6	11.4
STRUCTURE	4.6	65.9
LEARNING ALONE/PEER	18.2	11.4
AUTHORITY FIGURE PRESENT	2.3	34.1
LEARN IN SEVERAL WAYS	9.1	00.0
AUDITORY	2.3	20.4
VISUAL	15.9	6.8
TACTILE	13.7	20.5
KINESTHETIC	6.8	11.4
REQUIRES INTAKE	00.0	25.0
EVENING-MORNING	38.5	2.3
LATE MORNING	25.0	6.9
AFTERNOON	00.0	59.0
NEEDS MOBILITY	2.3	15.8

APPENDIX A – TABLE 2

PRODUCTIVITY ENVIRONMENTAL PREFERENCE SURVEY:
 REPRESENTATIVE CLASS PROFILE OF ST. JOHN'S UNIVERSITY
 LAW STUDENTS – 2001
 (Profile Assessed for Pilot Study)

Distributions of Opposite – Preferences and Strong Preferences
 for Learning Style Elements
 Group Summary

PEPS ELEMENTS	% OPPOSITE PREFERENCE <39	% STRONG PREFERENCE >60
NOISE LEVEL	0.00	14.63
LIGHT	12.20	19.51
TEMPERATURE	24.39	19.51
DESIGN	12.20	14.63
MOTIVATION	7.32	4.88
PERSISTENCE	4.88	17.07
RESPONSIBILITY	21.95	21.95
STRUCTURE	0.00	65.85
LEARNING ALONE/PEER	17.07	21.95
AUTHORITY FIGURE PRESENT	2.44	31.71
LEARN IN SEVERAL WAYS	17.07	9.76
AUDITORY	9.76	24.39
VISUAL	9.76	7.32
TACTILE	4.88	21.95
KINESTHETIC	7.32	26.83
REQUIRES INTAKE	7.32	21.95
EVENING-MORNING	36.59	2.44
LATE MORNING	34.15	7.32
AFTERNOON	0.00	60.98
NEEDS MOBILITY	4.88	41.46

The Productivity Environmental Preference Survey (“PEPS”)¹³⁶ was used to collect data for this study. The data collected represents answers to 100 statements that elicit self-diagnostic responses. Examples of questions are: “The things that I remember best are the things that I hear.” “The one job I like doing *best*, I prefer doing alone.” The student would then choose one answer from the following choices: strongly disagree, disagree, uncertain, agree, or strongly agree. The data yield a computerized profile of each student’s preferred learning style.

The column on the left above (see column above titled “% Opposite-Preferred <39”) indicates the percentage of students who selected “strongly disagree” for a series of questions that related to a particular learning-styles element. The column on the right above (see column above title “% Strong-Preferred >60”) indicates the percentage of students who selected “strongly agree” for a series of questions that related to a particular learning-styles element. Students’ reactions that are in the middle—such as “disagree,” “uncertain,” or “agree” are not indicated in the table above because the data are not strong indicators of preference for the individual elements.

An instrument used for learning-styles assessment needs to be both reliable and valid.¹³⁷ “Both the reliability and validity of the PEPS has been established” in prior studies.¹³⁸

136. The PEPS was scored by Price Systems, Inc., Box 1818, Lawrence, KS. 66044-1818.

137. See Boyle & Dunn, *supra* note 1, at 225-26 & nn. 62-63 (providing definitions of the terms “reliable” and “valid”).

138. *Id.* at app. 1 (providing documentation for reliability and validity of the PEPS); see also Barbara Given et al., *Personality Types and Learning Styles of College Freshmen*, 13 NAT’L F. APPLIED EDUC. RES. J. 23, 29-30 (1999-2000) (reporting on the reliability and validity of the PEPS and determining that “[t]he PEPS is one of the most comprehensive learning style instruments available for adult use.”).

APPENDIX B

SAMPLE FROM BOYLE AND RUSSO CAP

Objective Four (4):

Develop a working knowledge of *secondary authority* needed to write the assigned research memorandum of law.

Instructions: Complete Activity Alternative One (1) and the accompanying Reporting Alternative. Then complete one (1) more pair. This is not an assignment where quantity is important. Instead, please focus on the quality of what you have found.

Activity Alternative One (1):

Write a list of steps that you took in researching secondary authority (such as encyclopedias) for your memorandum assignment.

Provide the sources you used.

Also include your search words and phrases. This listing must include an explanation as to how the material will be used in your memo – does it provide explanation as to a rule of law?

A list of sources without an indication that you read and reflected on the material is not acceptable. (T/V)*

Reporting Alternative One (1):

Provide the list and explanations for Professor Boyle.

Activity Alternative Two (2):

Create a multi-colored chart depicting secondary source print sources that you used in researching your memo. Include words/phrases and key numbers.

(T/V)

Reporting Alternative Two (2):

Provide the chart for Professor Boyle, and be prepared to answer questions about it.

Activity Alternative Three (3):

Write a lesson plan for teaching which secondary authority sources were useful for the memorandum assignment. (T/V/A)**

Reporting Alternative Three (3):

Show the lesson plan for Professor Boyle and be prepared to enact parts of it with her or with classmates.

Activity Alternative Four (4):

Create an audio cassette tape of a library tour using the secondary authority materials used in researching your memo as a basis for the tour.(A/K)***

Reporting Alternative Four (4):

Playing the tape for Professor Boyle.

* (T/V) = Appeals to tactual and/or visual preferenced students.

** (T/V/A) = Appeals to tactual, visual, and/or auditory preferenced students.

*** (A/K) = Appeals to auditory and/or kinesthetic preferenced students.

APPENDIX C

SAMPLE FROM LEFKOWITZ CAP TWO

Behavioral Objective 2: Describe the following five (5) legislative responses to end-of-life issues: Patient Self-Determination Act; Substituted Judgment/Guardianship; Durable Power of Attorney; Health Care Proxy; Living Will.

Complete at least one (1) Activity and Reporting Alternative.

Activity Alternatives

1. Make an audiotape depicting the following scenario: You are a judge describing to a jury what the five (5) legislative responses to end-of-life issues mean.

A

2. Create a game of “Who Wants to Be a Millionaire?” Answering questions on at least five (5) legislative responses to end-of-life issues.

K

3. Design a multi-colored poster illustrating at least five (5) legislative responses to end-of-life issues.

TV

Reporting Alternatives

1. Form a group of six (6) students and listen to the tape. Decide if all group members agree on the accuracy of the tape.

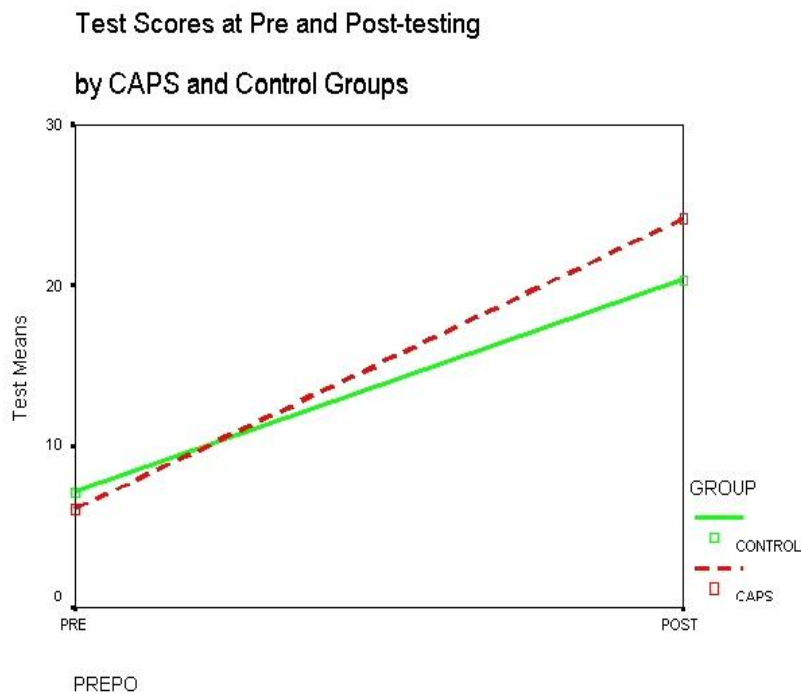
2. Invite a group of four (4) students be the audience.

3. Display the poster in the front of the room for all to view.

APPENDIX D

FINDINGS FROM BOYLE AND RUSSO STUDY

In the Boyle and Russo study, law students in both sections had relatively similar scores on the pre-test. On the post-test, however, students in the experimental section who received the CAP performed statistically significantly better, $p < .001$, than those in the traditional section who received the traditional research protocol.¹³⁹ The results of this magnitude might occur by chance around one in a thousand times.



139. See *supra* note 104 (providing discussion of scoring pre-tests and post-tests).

APPENDIX E

FINDINGS FROM LEFKOWITZ STUDY¹⁴⁰Achievement

Table 1 displays the findings of the means and standard deviations for all four different presentations delivered by two treatments (Traditional 1, CAP 2, Traditional 3, and CAP 4) to the allied health students.

A repeated-measures ANOVA was performed on four achievement means for the allied health students of four participating classes. The analysis yielded results based on three tests: (a) main effect of program; (b) main effect of treatment; (c) program by treatment interaction. The following are the results of the study with respect to achievement (Table 2):

The main effect of program sought to determine whether the four participating allied health programs scored differently from one another on average across the four instructional presentations. The test revealed that no significant difference among the programs was evident based on this analysis, $F(3,82)=0.92$, $p=0.43$.

The main effect of treatment sought to determine whether the CAP method differed from the traditional method of instruction on average over the four participating programs. Results of this analysis demonstrated that the CAP method displayed a significant p value, indicating a difference between the traditional versus the CAP method of instruction, $F(1,82)=528$, $p<.0001$. The Effect Size, calculated by dividing the difference between the means by the square root of the error means square, was 1.27, which indicated a very strong difference between the two methodologies.

Program by treatment interaction analysis sought to ascertain whether the advantage of CAP over the traditional method was constant for the four program types, or was it that the CAP was more effective for some of the programs than for other programs? Results indicated that the advantage of CAP over traditional method of instruction was constant over the four participating programs, $p=.6019$ yielding no significance.

140. Lefkowitz, *supra* note 9, at 51-55.

Table 1

Means and Standard Deviations of Four Different Presentations:

CAP (C2 and C4) versus Traditional (T1 and T3)

<u>Presentation</u>	<u>M</u>	<u>SD</u>	<u>n</u>
T1	81.90	5.23	86
C2	90.02	4.40	86
T3	82.80	4.67	86
C4	91.41	4.07	86

Table 2

Repeated Measures ANOVA

<u>Source</u>	<u>df</u>	<u>Mean Square</u>	<u>F Value</u>	<u>Sig. of F</u>
Program	3	37.55	0.92	0.4339
Error	82	40.71		
Treatment	1	5713.00	528.16	<.0001
Treatment X Program	3	6.74	0.62	0.6019
Error	82	10.81		

Attitude

To analyze the Semantic Differential Scale for all four participating allied health programs, a series of one-sample t- tests were performed for each item on the scale. These t-tests were designed to compare the mean ratings for each sample versus a hypothetical value of three, indicating a neutral preference. The Bonferroni method was used to adjust *p* values for multiple tests. All *p* values remained significant after this adjustment. The means of all items were significantly greater than three (Table 3).

These findings demonstrated that all items in the SDS indicated significantly higher attitude ratings for the CAP over the traditional methodology.

Table 3

Semantic Differential Scale Comparing Attitude Ratings Of CAP Versus Traditional Methodology for Allied Health

Students (n=86)

<u>Trait</u>	<u>M</u>	<u>SE</u>	<u>p</u>
Helpful	4.60	.058	<.0001
Clear	4.30	.077	<.0001
Energizing	4.59	.060	<.0001
Calming	4.06	.084	<.0001
Strengthening	4.17	.072	<.0001
Relaxing	4.25	.083	<.0001
Wonderful	4.19	.075	<.0001

2002/03]	PRESENTING A NEW INSTRUCTIONAL TOOL	31	
Steady	4.22	.074	<.0001
Good	4.19	.080	<.0001
Sharp	4.45	.061	<.0001
Interesting	4.58	.053	<.0001
