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# Should Laptops Be Banned? Providing a Robust Classroom Learning Experience Within Limits

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# Should Laptops Be Banned? Providing a Robust Classroom Learning Experience Within Limits

By Robin A. Boyle

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"...I advocate a moderate position: Professors should permit laptops in the classroom, but subject to controls that can channel benefits and minimize distractions."

## Introduction

Technology abounds today's law students. Laptops, iPods, iPads, and BlackBerrys are just a few of the newly developed modes of communication, note-taking, and music-storing devices that creep into our vocabulary – and students' backpacks.[1] Given the competitive nature of law school, students understandably bring laptops to class hoping to maximize their performance. Unfortunately for all involved, students use their laptops beyond the task of note-taking. The distractions that present themselves in class have led law professors to complain on various fora about the frequency of laptop use in the classroom.[2] Some posit that students' inappropriate use of laptops in the classroom has exceeded acceptable limits.[3]

As a result, some law professors have banned laptop use in their classes,[4] while others have allowed laptop use with restraint.[5] Research reveals that laptops are beneficial for those whose learning style complements their use; laptop use may also slightly benefit all students, regardless of learning style.[6] Because laptops appeal to both tactual-[7] and visual-oriented learners[8] and may additionally benefit the whole class regardless of learning-style preferences, I advocate a moderate position: Professors should permit laptops in the classroom, but subject to controls that can channel benefits and minimize distractions.[9] Particularly for a skills class, such as Legal Research and Writing, it would be crippling to ban laptops. For casebook courses, some students, if not all, would benefit from continued use of laptops - within limits.

## Learning-Style Model

"Learning style" is "the way in which each person begins to concentrate on, process, and retain new

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1 See generally M. H. Sam Jacobson, *Paying Attention or Fatally Distracted? Concentration, Memory and Multi-Tasking in a Multi-Media World,* 16 Legal Writing: J. Legal Writing Inst. 419 (2010) (describing problems associated with fast-paced technology and students' developing minds).

2 E.g., 2008 AALS Annual Meeting by the Section on Teaching Methods, called Attractions and Distractions: Student Use of Laptop Computers in the Classroom, which was held in N.Y., N.Y.

3 See Jeff Sovern, Law Student Laptop Use During Class for Non-Class Purposes: Temptation v Incentives, draft posted http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1805107 (last visited July 2, 2011) ("This study has found that many students are significantly distracted in law school classes."); Carrie B. Fried, In-Class Laptop Use and Its Effects on Student Learning, 50(3) Computers & Educ. 906, 910 (2008) (reporting that laptop users admitted to spending an average of 17 minutes of a 75-minute class on something other than note-taking).

4 See Kevin Yamamoto, *Banning Laptops in the Classroom: Is it Worth the Hassles?* 57 J. Legal Educ. 477 (2007) (describing his reasons and experience banning laptops in his tax class); Nancy G. Maxwell, *From Facebook to Folsom Prison Blues: How Banning Laptops in the Classroom Made Me A Better Law School Teacher,* 14 Rich. J.L. & Tech. 4 (2007).

5 See, e.g., Kristen Murray, *Let Them Use Laptops: Debunking the Assumptions Underlying the Debate over Laptops in the Classroom,* 36 Okla. City U. L. Rev. 185 (2011).

6 See Maureen Martini, An Analysis of the Relationship(s) Between and Among Computer-Assisted Instruction, Learning Style Perceptual Preferences, Attitudes, and the Science Achievement of Seventh Grade Students in a Suburban, New York School District 15-16 (1986) (Ed. D. dissertation, St. John's University) Dissertation Abstracts Int'l, 47, 877A (on file with author).

7 See *id.* at 15-16 (explaining that to study students' ability to absorb tactually, she provided a lesson through computer-assisted instruction); Robin Boyle & James B. Levy, The Blind Leading the Blind: What If They're Not All Visual or Tactile Learners? 22(2) The Second Draft 6 (2008).

8 See Martini, supra note 6, at 15-16 (explaining how visual learners prefer to learn through use of pictures, diagrams, books, and "resources that require reading and seeing").

9 See generally Jana R. McCreary, *The Laptop-Free Zone,* 43 Val. U. L. Rev. 989, 1016 (2009) (concluding that both global and analytic learners "can benefit from using a laptop in a classroom" ).

and difficult information."[10] A learning-style model developed by Drs. Rita and Kenneth Dunn ("Dunn and Dunn Model") is based upon more than three decades of research spanning 135 institutions of higher education throughout the world. Currently, the Model includes 26 learning-style elements.[11] These 26 variables are subdivided into six stimulus strands: Perceptual, Psychological, Physiological, Emotional, Environmental, and Sociological.[12] Researchers have verified and offered independent "empirical support of the efficacy of the Dunn and Dunn methodology."[13]

The tactual element is included within the larger category of Perceptual Strengths.[14] Tactual learners need to handle and manipulate instructional materials in order to best absorb new and difficult information. During lectures, tactual learners retain the information best if they engage in small motor skills. Tactual learners learn best by taking notes traditionally, such as with pen and paper or on chart paper.[15]

The visual element is also included within the category of Perceptual Strengths. The Dunn and Dunn Model, along with Building Excellence, an online assessment tool,[16] distinguish between visual-picture learners[17] and visual-text learners.[18] Visual-picture learners learn best if they create or refer to "pictures, flowcharts, or graphs."[19] Visual-text learners prefer text in handouts, overheads, or casebooks to help them retain an auditory presentation or lecture.[20] Not all adults are visual learners, but those who are "can remember 75 percent of the academic information they have read during a 30-40 minute interval."[21]

## Is There Validity to the Theory that Matching Instructional Strategies to Individual Learning Style Improves Learning?

Numerous studies have found that students learn best when taught with "complementary, rather than dissonant, instructional strategies."[22] Although "[i]ndividuals differ in how they absorb and process new and difficult information," the material is best absorbed and processed according to their primary learning-style strengths.[23] Study after study indicates patterns between academic achievement and learning style, giving researchers

"Numerous studies have found that students learn best when taught with 'complementary, rather than dissonant, instructional strategies.'"

[10] Rita Dunn & Shirley A. Griggs, Multiculturalism and Learning Style: Teaching and Counseling Adolescents 14-15 (1998); See Rita Dunn & Kenneth Dunn, Teaching Secondary Students Through Their Individual Learning Styles: A Practical Approach for Grades 7-12, 2 (1993) (applicable to adults as well as young learners).

[11] See the learning-styles website at www.learningstyles.net (last accessed on July 2, 2011); Susan Rundle & Andrea Honigsfeld, with Rita Dunn, Building Excellence: An Educator's Guide to the Learning Individual (2007).

[12] See Rundle, Honigsfeld, with Dunn, supra note 11, at 8-9. Perceptual Strengths includes auditory, visual, tactual, and kinesthetic preferences. Psychological Strengths includes global v. analytic processing, impulsive v. reflective. Physiological Strengths include time-of-day energy levels, food or liquid intake, and mobility while learning. Emotional Strengths include motivation, persistence (completing one task at a time or multi-tasking), responsibility (conformity v. nonconformity), and structure. Environmental Strengths include sound, light, temperature, and furniture/seating design. Sociological Strengths include learning in alone/pairs/groups, with/out an expert, and variety of ways v. consistent patterns. *Id.*; Robin A. Boyle & Rita Dunn, *Teaching Law Students Through Individual Learning Styles,* 62 Alb. L. Rev. 213, 224-25 (1998) (after assessing the learning styles of first-year students at St. John's University School of Law, concluded that "law students were diverse in their learning styles").

[13] Ralph A. Terregrossa, Fred Englander, and Zhaobo Wang, Why Learning Styles Matter For Student Achievement in College Economics, 9(1) J. Economic Educators 16, 30 (Summer 2009).

[14] See Patricia Murphy Raupers, Research on Perceptual Strengths: I See What You Mean; I Hear What You Say; Are You Staying in Touch? Are You Moving My Way? in Synthesis of the Dunn and Dunn Learning-Style Model Research: Who, What, When, Where, and So What? 23, 23 (Rita Dunn & Shirley A. Griggs, eds., 3d ed. 2007).

[15] See Rundle & Honigsfeld, with Dunn, supra note 11, at 23.

[16] For more information, go to www.learningstyles.net (last accessed July 2, 2011).

[17] See Rundle & Honigsfeld, with Dunn, supra note 11, at 18-19.

[18] *See id.* at 20-21.

[19] *See id.* at 19.

[20] *See id.* at 21.

[21] Rita Dunn, Armin P. Thies, Andrea Honigsfeld, Synthesis of the Dunn and Dunn Learning-Style Model Research: Analysis from a Neuropsychological Perspective 8 (2001) (St. John's University, School of Educ. & Hum. Serv.).

[22] *Id.* at 9; Dunn & Griggs, supra note 10, at 20 ("When adolescents were introduced to new material through their perceptual preferences, they remembered significantly more than when they were introduced to similar material through their least-preferred modality.")

[23] Dunn, Thies, & Honigsfeld, supra note 21, at 9; Dunn & Griggs, supra note10, at 7.

"[C]omputer use is both tactual and visual. It is tactual because of the user's heavy reliance upon using one's hands, and it is visual because of the images projected on the screen."

further cause to believe that learning style and brain functions are connected.[24]

For example, Ralph Terregrossa and others recently found that "learning style characteristics of students [in a college economics course] do appear to have a significant relationship to the students' achievement."[25] These researchers inferred that student performance can be positively influenced by conveying the subject material in a congruent manner to the learning style of the students.[26] Similarly, in a study involving adults, Joanne Ingham found that when truck drivers, mechanics and managers were taught using an instructional style that matched their learning-style preferences, they learned significantly more.[27]

Researchers had similar findings for college students. Rachelle Maltzman found positive results when she taught developmental college students reading and writing using instructional strategies that complemented their learning style.[28] Regina Rochford also taught developmental college students with instructional materials that complemented their learning-style preferences.[29] Rochford found statistically higher writing-test scores in her study results when the students' materials complemented their learning style.[30]

Thus, if students' understanding of course content improves when the method for learning complements their learning style, one can deduce that laptop use in the classroom would provide a benefit to those students who prefer tactile and visual learning. Researcher Maureen Martini proved just that.

### Is Computer Use both Tactual and Visual?

According to Maureen Martini's study,[31] computer use is both tactual and visual. It is tactual because of the user's heavy reliance upon using one's hands, and it is visual because of the images projected on the screen.

Martini's study focused on computer usage and the matching and mismatching of students with instructional strategies. She studied the "relationship(s) between perceptual learning style characteristics and computer-assisted instruction and the effects of matched and mismatched conditions on student achievement in science and attitudes toward each strategy."[32] Specifically, after assessing the learning styles of seventh grade subjects, she ascertained which ones were auditory, tactual, or visual, among other learning-style elements.[33] In one part of the study, Martini provided the same science content to students in ways that complemented their learning styles. For instance, auditory-preferenced students received the subject matter by means of a cassette and tape recorder.[34] The tactual students received computer-assisted instruction by "drill and practice, tutorials, simulation, problem solving, games, testing and evaluation, diagnosis and prescription."[35] The visual students received the same science content as the other two, but through

24 See generally Dunn & Griggs, supra note 10, at 15.

25 Terregrossa, et al., supra note 13, at 29.

26 *Id.*

27 Joanne M. Ingham, Matching Instruction with Employee Perceptual Preference Significantly Increases Training Effectiveness, 2(1) Human Resource Development Q 53, 62-63 (Spring 1991).

28 Rachelle Maltzman, Effects of traditional versus learning-style strategies on community college students' achievement in and attitudes toward developmental reading and writing 153(2008) (Ed. D. dissertation, on file with St. John's University).

29 Regina Rochford, Effects of learning-style responsive materials on underachieving remedial-writing students at an urban community college (2004) (Ed. D. dissertation, St. John's University). Dissertation Abstracts Int'l, A64 (12) (on file with St. John's University).

30 *Id.*

31 Martini, supra note 6.

32 *Id.* at 11. Students' attitudes in conjunction with their learning styles were explored in this study.

33 See *id.* The Learning Style Inventory was the assessment tool used in this study, which is based upon the Dunn and Dunn Model. Id. at 15-18, 69-71.

34 See *id.* at 16.

35 *Id.*

presentation in written form.[36] The study also mismatched students by random assignment.[37] In this way, students who were tactual, for instance, were given the content in either auditory (by using a cassette) or visual form (reading materials). All students' level of achievement in the subject matter was determined by criterion-referenced tests.[38]

The results of the Martini investigation revealed "the matching of individual students' identified perceptual preferences with complementary instructional methods increased science achievement test performance."[39] Martini summarized her study: "[t]he results verified the effectiveness of matching instructional methods with the diagnosed perceptual preference of individual students."[40]

Martini also found that the computer-assisted instruction "was most effective" for all three categories of learners – auditory, visual, and tactual – although it was more effective for tactual students than for the other two.[41] In applying the Martini study to what we know about the diverse learning styles of law students, laptop use during class may be somewhat beneficial for all students, but ideally for tactual learners.

Researcher William Clarke conducted a study with low-skilled and below-average skilled high school students, measuring whether their math skills improved (or declined) when given computer-assisted instruction.[42] Clarke found that students improved "their math skills to a greater extent in a computer setting than in a non-computer setting."[43] Those with mobility and tactile learning-style preferences showed significant improvement in their math skills.[44] Clarke deduced that because the dominant trait of tactile learners is the continuous hand activity, this need was satisfied with the students' hand manipulation of the computer keyboard.[45]

Thus, students who underachieve academically can improve their academic performance when they are taught in ways that complement their learning style.[46] This is true for tactual (and kinesthetic) students whose learning-style preferences are often overlooked in conventional schools. In applying the findings of these studies to law students, we can predict that those who are tactual and visual would benefit from laptop use in the classroom because it complements their learning style. To prohibit their use of laptops could actually retard their development.

## Are Young Adults More Likely To Be Tactual and/or Visual?

Studies have shown that Generation X is slightly more tactual than others. For example, researcher Renee Cambiano found that Baby Boomers would not find tactual engagement (note-taking) as advantageous as would the Gen X population.[47] Closer to home, Boyle

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[36] *Id.*

[37] *Id.* at 69.

[38] *Id.* at 16-17, 73-76.

[39] *Id.* at 96

[40] *Id.* at 104.

[41] *Id.* at 107.

[42] William Robert Clarke, the effects of computerized instruction on the improvement and transfer of math skills for low-skilled and below average-skilled sophomore students, considering student gender, ethnicity, and learning style preferences 5, 57 (1993) (ed. D. Dissertation, University of La Verne).

[43] *Id.* at 81, 87.

[44] *Id.* at 87.

[45] *Id.*

[46] See Haver Crosley, Effects of Traditional Teaching vs A Multisensory Instructional Package of the Science Achievement and Attitudes of English Language Learners Middles-School students and English-Speaking Middle-School Students, 86 (2007) (Ed. D. dissertation, St. John's University) (on file with author). Haver Crosly found that tactual/kinesthetic-preferenced middle-schoolers achieved their best when using instructional materials (the content was science) that were congruent with their learning styles.

[47] Renee Cambiano, *Learning Preferences of the Age Cohorts: Generation X, Baby Boomers, and the Silent Generation* 15, 70 (1999) (Ed. D. Doctoral Dissertation, University of Memphis) (on file with author). She found significant differences between the Baby Boomer Generation (birth years 1943-1960) and both the Gen Xers (birth years 1961 – 1981) and the Silent Generation (birth years 1925 – 1942) on tactual preferences. Her results indicated that Gen X and the Silent Generation "prefer to use manipulatives to learn new information" and to engage in note-taking, which would be less effective for the Baby Boomers. *Id.* at 70. The population for the Cambiano study was graduate students. *Id.* at 21.

and Ingham found that Generation Xers in law schools are slightly more tactual than their professors.[48] It is important to note that the percentage of those who strongly prefer to learn tactually or visually is small in any cohort. This Author's empirical studies of law students conducted over a ten-year period indicate that only approximately 20 percent demonstrate a preference for tactual learning and fewer than that, 10 percent, are visual learners.[49] Additionally, Boyle, Minneti, and Honigsfeld found that law students were less tactual compared with their peers in other academic disciplines.[50]

"At the outset, inform students about reported results...indicating that students can be distracted by inappropriate website surfing and emailing during class."

### Implications for the Classroom

Although teachers need to find their own homeostasis in their classrooms, the complete prohibition of laptops is less than optimal for tactual and visual learners who actually use them for appropriate purposes. When students are taught in ways that complement their learning styles, they will improve academically.[51] And, as the Martini study[52] indicated, there may be some benefit to all students, regardless of learning style, who use laptops for note-taking and other instructional purposes while in class. Thus, professors should allow students to use their laptops in their classrooms, but within limits.

To curb laptop distractions, professors could try a variety of approaches:

- At the outset, inform students about reported results from prior studies[53] indicating that students can be distracted by inappropriate website surfing and emailing during class.[54] Explain that there are consequences for distractions.[55]
- Give students notice of penalties[56] for inappropriate laptop use, which could include a ban for the entire class for the remaining class period (this sparks peer pressure on the offending student).
- Announce, "All eyes on me!" when wayward eyes focus on the monitors at unusual times.
- Suggest, at appropriate times, to "close laptops."[57]
- Develop a written laptop policy and place the statement prominently on the course syllabus.[58]
- Move the lecture along to a point where the students need to interact with each other or with pen and paper.

[48] Joanne Ingham & Robin A. Boyle, *Generation X in Law School: How These Law Students are Different from Those Who Teach Them,* 56 J. Legal Educ. 281, graphs A, B, & C (2006).

[49] *See* Boyle & Dunn, supra note 12, at app. 2; Robin A. Boyle, Bringing Learning-Style Instructional Strategies to Law Schools: You Be the Judge! in Practical Approaches to Using Learning Styles Application in Higher Education 158, 160 tbl. 17.4 (Rita Dunn and Shirley A. Griggs eds., Bergin & Garvey 2000); Robin A. Boyle & Lynne Dolle, *Providing Structure to Law Students – Introducing the Programmed Learning Sequence as an Instructional Tool,* 8 Legal Writing: J. Legal Writing Inst. 59, at app. A (2002); Robin A. Boyle, Karen Russo, and Rose Frances Lefkowitz, *Presenting a New Instructional Tool for Teaching Law-Related Courses: A Contract Activity Package for Motivated and Independent Learners,* 38 (1) Gonz. L. Rev. 1, at app. A (2003); Robin A. Boyle, *Employing Active-Learning Techniques and Metacognition in Law School: Shifting Energy from Professor to Student,* 81 U. Det. Mercy L. Rev. 1, at app. A (2003); Robin Boyle, Jeffrey Minneti, and Andrea Honigsfeld, *Law Students Are Different from the General Population: Empirical Findings Regarding Learning Styles,* 17 (3) Perspectives: Teaching Legal Res. and Writing 153 (Spring 2009).

[50] *See* Boyle, Minneti, & Honigsfeld, *supra* note 49, at 158-59.

[51] *See* Martini, *supra* note 6; Terregrossa, et al., *supra* note 13; Matlzman, *supra* note 28; Rochford, *supra* note 29.

[52] *See* Martini, *supra* note 6.

[53] *See, e.g.,* Sovern, *supra* note 3; Fried, *supra* note 3.

[54] *See* Tracy McGaugh, *Laptops in the Classroom: Pondering the Possibilities,* 14 (3) Perspectives: Teaching Legal Res. & Writing 163 (2006) (suggesting that professors first acknowledge to students that there is a potential problem with inappropriate laptop use in class).

[55] *See* Fried, *supra* note 3, at 912 (suggesting that professors warn students about the pitfalls of inappropriate laptop use during class time).

[56] *See* McGaugh, *supra* note 54.

[57] This Author has singled out one or two individuals and stated flatly, "close your laptops" when these students were blatantly smirking and typing at inappropriate times. This curbing sets a tone for the rest of the class. I have also talked to students outside of class about whether their use of laptops pertained to class matters.

[58] For example, I provide the following written policy on my syllabi: "Laptop policy: Students may use their laptops in class for purposes of taking notes or other academic work associated with my course. Laptop use inconsistent with this policy may result in suspension of laptop privilege in class."

- Have a laptop free zone by reserving certain rows for those with and without laptops.[59]

The following approaches would provide effective use of laptops:

- Have students use their laptops to draft answers to exercises in casebook or in legal writing texts. (For my Contracts class, I have students draft an essay based upon a former exam question. For my Legal Analysis and Writing class, I have students draft an application of law to fact paragraph. For my Drafting: Contracts class, I have students draft a provision of a contract.) Then have students send the drafts to an electronic assignment drop box (TWEN or another forum, such as the professor's email account), and allow the class to view these drafts on a screen. Provide a live critique of work displayed.
- Use Internet access for students to research short legal questions in class.
- Use laptops to access the documents you have previously posted (syllabus, course materials, assignments).
- In the classroom, explore wikis and customized polling features. The wiki will allow multiple students to edit a document. A professor can pose a question on the poll function and students can send in "yes" or "no" responses.
- Encourage students to be creative in designing a learning exercise in the form of a game (a word game, crossword puzzle) or PowerPoint slide show while in class.[60]

In conclusion, laptops can provide a classroom without walls. Students can research, create and send documents during class, and edit written work-in-progress. This will benefit those whose learning style is complementary with laptop use.[61] And by setting proper limits, all students may find their laptops beneficial for class use.



"[L]aptops can provide a classroom without walls. Students can research, create and send documents during class, and edit works-in-progress."

[59] See McCreary, supra note 9, at 104 (advocating an optimum learning environment because students have varied learning styles).

[60] See Boyle, Russo & Lefkowitz, supra note 49. When my students appear to need a fresh way to approach material, such as difficult concepts of contract building blocks or legal research, I suggest that they create their own resources using the Contract Activity Package. Id. I also include an open category for students to come up with their own ideas. Often, they turn to their laptops and create a game or slide show.

[61] After reading this Article, my Research Assistant commented, "I would feel crippled without a laptop in class." His comment sums up the point of this piece.

## Another **Perspective**

"Whether managing distractions, minimizing stress, or maximizing sleep, the bottom line is that we must attend to attending. Minds have always wandered, but our attention has never been more challenged than in this multi-media, high-tech world. Media and technology must be our tools, not our masters. Without learning to attend to the things that matter, we will be fatally distracted by every beep, flash, and pop-up, and therefore, be unable to perform the sophisticated cognitive work required of the study and practice of law. If the study and practice of law require attention, then attention needs developing just like any other skill. Developing attention requires practice, self-reflection, and diligence. ...If professors find their students are not attending to the class material, but instead are engaged in computer games, e-mail, instant messaging, and other technological distractions, professors need to ask why. ...The *why* may be that students are so used to being distracted that they have not yet learned how to pay attention."

M.H. Sam Jacobson, *Paying Attention or Fatally Distracted? Concentration, Memory, and Multi-Tasking in a Multi-Media World,* 16 Legal Writing 419, 461 (2010).