

ARTICLES

Goodbye Christopher Columbus Langdell?

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Summary

The call of this Article was to take “A Prospective Look” at Environmental and Natural Resources Law for the next 40 years with a special focus on law school teaching. Daunted by the hubris involved in prognosticating so far into the future, this piece more modestly explores three areas in which law school teaching is currently changing: I. Methods of Presentation; II. Use of Skills Exercises; and III. Influence of Digital Technologies and the Internet. To add an empirical component, the author canvassed AALS members about pedagogies they used both in class and outside of classroom time, as well as teaching tools they have employed, ranging from traditional exams or writing assessments to electronic devices, online teaching tools, and social networking. The Article summarizes the results of the survey as well as relevant research on effective teaching to provide glimpses into the law school classroom of the future.

Prognosticating requires hubris. Those who attempt to predict the future do so at the risk of facing ridicule when things do not turn out the way they projected. A case in point is predictions of natural gas reserves in the United States. In 2000, the U.S. Energy Information Administration forecast an impending shortage of natural gas.¹ This led to calls for construction of about 40 liquefied natural gas (LNG) import terminals to meet America’s rising demand.² Approximately 10 years later, the U.S. energy landscape has changed dramatically. Natural gas from unconventional sources, such as tight sands and shales, has been a game changer. U.S. electricity comes increasingly from natural gas, displacing power generation from renewables, nuclear, and even coal.³ The current natural gas glut has now fostered talk of converting our LNG ports from import to export terminals to ship U.S. supplies abroad.⁴

Yet, the call of this Article was to take “A Prospective Look” at Environmental and Natural Resources Law for the next 40 years with a special focus on law school teaching.⁵ Daunted by the hubris involved in trying to predict

Author’s Note: University of Denver Sturm College of Law has a strong focus on student learning and alternative learning as part of its strategic plan and its modern learning program. Denver Law is also participating in the Educating Tomorrow’s Lawyers Consortium, which now numbers 27 law schools, including Stanford, New York University, Washington & Lee, Vanderbilt, and Cornell, <http://educatingtomorrowslawyers.du.edu>.

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1. U.S. ENERGY INFORMATION ADMINISTRATION, WORLD ENERGY OUTLOOK 76 (2000).
2. JEFFREY LOGAN ET AL., JOINT INSTITUTE FOR STRATEGIC ENERGY ANALYSIS, NATURAL GAS AND THE TRANSFORMATION OF THE U.S. ENERGY SECTOR: ELECTRICITY 1 (Nov. 2012), available at <http://www.nrel.gov/docs/fy13osti/55538.pdf>.
3. U.S. ENERGY INFORMATION ADMINISTRATION, AEO 2013 EARLY RELEASE OVERVIEW: ENERGY CONSUMPTION BY PRIMARY FUEL (Dec. 5, 2012), http://www.eia.gov/forecasts/aeo/er/early_fuel.cfm (last visited Apr. 9, 2013).
4. JEFFREY LOGAN ET AL., JOINT INSTITUTE FOR STRATEGIC ENERGY ANALYSIS, NATURAL GAS AND THE TRANSFORMATION OF THE U.S. ENERGY SECTOR: ELECTRICITY 11 (Nov. 2012).
5. The author was chosen to speak on a panel for an AALS program co-sponsored by the Property Law and the Natural Resources and Energy Law Sections. This January 7, 2013, program, titled “40 Years of Environmental & Natural Resources Law—A Prospective Look,” was designed to bookend a retrospective program co-sponsored by the Environmental Law and North American Sections.

the next 40 years, this piece will more modestly explore three areas in which law school teaching is currently changing: I. Methods of Presentation; II. Use of Skills Exercises; and III. Influence of Digital Technologies and the Internet. We are seeing some dramatic changes in each of these areas that portend significant impacts on how we may teach in the future.

An empirical component of this Article is a survey about teaching methods, which the author distributed to members of the Natural Resources and Energy (NRE) Section of the American Association of Law Schools (AALS).⁶ The survey (hereinafter 2012 AALS Teaching Survey) canvassed the nature of pedagogies used by professors both in class and outside of classroom time, as well as teaching tools they have employed, ranging from traditional formative assessments (such as mid-term exams and mid-semester writing assignments) to electronic devices, online teaching tools, and social networking (such as clickers, Web 2.0 technologies, and blogs). Fifty-five of the 368 members of that NRE Section, or one-sixth, responded to the survey. Although approximately one-quarter of the respondents had five or fewer years of experience, approximately 35% had more than 20 years of teaching.⁷ In many respects, this group embraced progressive teaching methodologies, but because the survey was anonymous and did not allow tracking of questions, it does not indicate whether the newer or more experienced teachers are the ones most likely to embrace alternative pedagogies. The full survey questions and responses are available as an appendix to this Article.

The 2012 AALS Teaching Survey suggests traditional law school teaching methods are still overwhelmingly being employed in the classroom. So, this Article starts by examining traditional teaching methods in light of developments in cognitive research providing insights into how students best learn. Next, the Article addresses effective ways of adding fundamental legal skills and values to the traditional law school curriculum. Finally, it explores ways to satisfy the needs of today's active learners through digital technologies, flipped classrooms, and Massive Open Online Courses (MOOCs).⁸

I. Methods of Presentation

I hear and I forget; I see and I remember; I do and I understand.

—Chinese proverb⁹

The future stands on the shoulders of the past, so first, we must look back. Christopher Columbus Langdell is often credited with sparking the first revolution in law school teaching when he introduced the case method at Har-

vard Law School in the early 1870s.¹⁰ In the case method, leading cases or case excerpts are assembled into a case book. Before each class, students are assigned a selection of cases to review. Then, during class, the professor calls on individual students to present their briefs of a given case. The professor guides the students through a question-and-answer process to ensure the class appreciates the holding in each case and its significance to the body of law being studied.¹¹

Before Langdell, formal law school training consisted primarily of group lectures.¹² Lectures are lucrative for the sponsoring institution, as one professor can teach many students at the same time. Lectures also can have an advantage over individual apprenticeships, the main form of lawyer training before law schools, for conveying consistent, high-quality information. Lectures can be especially effective for providing an overall conceptual framework, for updating or summarizing scattered material, or for focusing on key concepts.¹³

However, research shows that while lectures may allow a professor to present more than might be covered in an apprenticeship, most of that material does not get into each student's notes or memory.¹⁴ Students have only a passive role in the lecture process, and cognitive psychologists have found that audiences have difficulty remembering information if it is conveyed only through listening.¹⁵

By educational theory standards, the Socratic Method approach, which was a part of Langdell's reforms, was a great step forward. Instead of passively listening to lectures and taking notes, students were now expected to read real cases and derive principles of law for themselves through Socratic questioning. Thus, to the extent the Socratic Method is a discussion, it would track with research that shows discussion methods are more effective than lectures for achieving the main goals of student retention, transfer of knowledge to new situations, development of problem solving, thinking, attitude change, and motivation for additional learning.¹⁶

The 2012 AALS Teaching Survey shows that both lecture and Socratic question-and-answer remain as two of the primary methods of teaching law for natural resources

6. The author did not have access to e-mail distribution lists for the other sponsoring sections.
7. A total of 14.5% of the more experienced professors had over 30 years in teaching.
8. See <http://www.youtube.com/watch?v=CZ5Vy9BgSeY>.
9. KENNETH D. MOORE, EFFECTIVE INSTRUCTIONAL STRATEGIES FROM THEORY TO PRACTICE 5 (Sage 2d ed. 2009).

10. Bruce A. Kimball, *The Proliferation of Case Method Teaching in American Law Schools: Mr. Langdell's Emblematic "Abomination," 1890-1915*, 46 HIST. EDUC. Q. 192, 192 (2006).
11. Troy Simpson, *The Art of Written Persuasion: The Problem With the Case Method and the Case for the Problem Method* (Sept. 1, 2008), <http://www.llrx.com/columns/persuasion2.htm> (last visited Apr. 9, 2013), citing Myron Moskovitz, *Beyond the Case Method: It's Time to Teach With Problems*, 42 J. LEGAL EDUC. 241, 244 (1992).
12. As opposed to apprenticeships, which are the ultimate form of hands-on learning.
13. WILBERT J. McKEACHIE & MARILLA SVINICKI, McKEACHIE'S TEACHING TIPS 58 (Houghton Mifflin 12th ed. 2006).
14. James Hartley & Ivor K. Davies, *Note Taking: A Critical Review*, 15 PROGRAMMED LEARNING & EDUC. TECH. 207 (1978); McKEACHIE & SVINICKI, *supra* note 13, at 36.
15. Hartley & Davies, *supra* note 14; McKEACHIE & SVINICKI, *supra* note 13, at 36.
16. McKEACHIE & SVINICKI, *supra* note 13, at 58 (citing WILBERT J. McKEACHIE ET AL., TEACHING AND LEARNING IN THE COLLEGE CLASSROOM: A REVIEW OF THE RESEARCH LITERATURE (2d ed. 1990).

and energy professors. Of those surveyed, 94.5% use lectures and 94.5% use the Socratic Method.

Cognitive psychology shows that if new knowledge is processed more deeply and actively, it is much more likely to be retained and retrieved.¹⁷ Therefore, the “active learning” that the Socratic Method requires may be more effective than lectures. However, the way many professors employ the Socratic Method may undermine its value. The only student that is actively learning is the one who is under the inquisitorial fire of the professor’s barrage of questions. The exchange may still be a relatively passive learning experience for the rest of the students in the class who are simply listening and trying to glean the message they should take from the repartee between the professor and their classmate.

Another drawback of traditional lectures and the Socratic Method has been their heavy reliance on only an auditory style of delivery. Psychologists have identified a number of strategies for better understanding how humans process information, and there is a growing trend for modern educators to make efforts to accommodate differences in students by employing a variety of teaching strategies.¹⁸

Cognitive science research shows that learners differ and these differences affect their performance. Consequently, to be most effective, teachers should take these differences into account through “learner-centered” instruction.¹⁹ Three commonly recognized categories for the way different learners process information or approach problem solving are: (1) Myers-Briggs personality types; (2) VARK learning styles; and (3) Kolb learning styles.²⁰ The psychological theory of “multiple intelligences” also has been embraced by many educators,²¹ but it is less tested at this point and will not be addressed further here.

Myers-Briggs uses a Type Indicator (MBTI) instrument that measures an individual’s tendencies in four categories: Extrovert or Introvert; Sensing or Intuiting; Thinking or Feeling; and Judging or Perceiving.²² The

result is an alphabet soup of categorizations from ISTJ to ENFP and everything in between.²³ One study in a law school setting showed that understanding their MBTI profiles was valuable for learning negotiation skills, because it helped students “see when their behavioral tendencies are effective and ineffective within the strategy-style matrix.”²⁴

VAR²⁵ is one of the most widely used learning-style models.²⁶ Neil D. Fleming of New Zealand is credited with expanding on neurolinguistic programming theories to develop it.²⁷ The acronym VARK stands for four different approaches to learning: Visual (V) (preference for information displayed in images and pictures other than in words); Aural or Auditory (A) (preference for hearing information); Read/write (R) (preference for information displayed as words); and Kinesthetic (K) (“perceptual preference related to the use of experience and practice (simulated or real) either through concrete personal experiences, examples, practice or simulation”).²⁸ Students can identify their preferred style to focus on what works for them, and educators can prepare classes to address each of the areas to make the lesson inclusive for all members of their audience regardless of learning preference.

In 1984, David Kolb, from Case Western Reserve, developed an instrument for plotting individual learning styles on a matrix.²⁹ One axis measured preferences for how to approach new information through Concrete Experience (feeling) or Abstract Conceptualization (thinking). The other axis plotted two ways for transforming experience from Reflective Observation (watching) to Active Experimentation (doing).³⁰ Kolb concluded that these styles are acquired preferences and adaptable, rather than fixed characteristics. Thus, students can learn to learn more effectively in different modalities.

Although there is some controversy over the “matching hypothesis”—i.e., whether matching teaching style to students’ learning preferences predicts better learning outcomes—Kolb and other researchers believe individu-

17. See e.g., SUSAN A. AMBROSE ET AL., *HOW LEARNING WORKS: SEVEN RESEARCH-BASED PRINCIPLES FOR SMART TEACHING* (2010).

18. DEREK BRUFF, *LEARNING STYLES: FACT AND FICTION—A CONFERENCE REPORT* (2011), available at <http://cft.vanderbilt.edu/2011/01/learning-styles-fact-and-fiction-a-conference-report/>.

19. E.g., SUSAN A. AMBROSE ET AL., *HOW LEARNING WORKS: SEVEN RESEARCH-BASED PRINCIPLES FOR SMART TEACHING* 23-24, 133-36 (2010).

20. MICHAEL HUNTER SCHWARTZ, *EXPERT LEARNING FOR LAW STUDENTS* 55-66 (Carolina Academic Press 2d ed. 2008).

21. See, e.g., *HOW PEOPLE LEARN: BRAIN, MIND, EXPERIENCE, AND SCHOOL* 101 (John Bransford et al. eds., 2000) (citing HOWARD E. GARDNER, *FRAMES OF MIND* (1983); HOWARD E. GARDNER, *THE UNSCHOOLED MIND* (1991)). Howard Gardner has identified eight such intelligences: (1) linguistic; (2) logical; (3) musical; (4) spatial; (5) bodily kinesthetic; (6) interpersonal; (7) intrapersonal; and (8) naturalistic. Two of these intelligences—linguistic and logical—are most valued in schools. Although the application of multiple intelligences to teaching is still in its experimental stages, it does suggest different approaches and modes of presenting key concepts and in allowing students to demonstrate their understanding. *Id.*; HOWARD E. GARDNER, *EXTRAORDINARY MINDS: PORTRAITS OF EXCEPTIONAL INDIVIDUALS AND AN EXAMINATION OF OUR EXTRAORDINARINESS* (1997).

22. *MBTI Basics*, MYERS & BRIGGS FOUNDATION, <http://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/> (last visited Apr. 9, 2013). You can take the test for free at <http://www.humanmetrics.com/cgi-win/jtypes2.asp>.

23. For a breakdown of the U.S. population into Myers-Briggs categories, visit *How Frequent Is My Type?*, MYERS & BRIGGS FOUNDATION, <http://www.myersbriggs.org/my-mbti-personality-type/my-mbti-results/how-frequent-is-my-type.asp> (last visited Apr. 9, 2013).

24. Gini Nelson, *Myers-Briggs Type Indicator (MBTI) Applications in a Law Practice*, 4 LAW TRENDS & NEWS PRAC. AREA NEWSL. (2008), https://www.americanbar.org/newsletter/publications/law_trends_news_practice_area_e_newsletter_home/business_nelson.html (last visited Apr. 9, 2013).

25. *VAR²⁵: A Guide to Learning Styles*, <http://www.vark-learn.com> (last visited Mar. 11, 2013). VARK also addresses multimodal learners. *Id.*

26. Walter L. Leite et al., *Attempted Validation of the Scores of the VARK: Learning Styles Inventory With Multitrait-Multimethod Confirmatory Factor Analysis Models*, in EDUC. & PSYCHOL. MEASUREMENTS 2 (2009).

27. Thomas F. Hawk & Amit J. Shah, *Using Learning Style Instruments to Enhance Student Learning*, 5 DECISION SCI. J. INNOVATIVE EDUC. (2007).

28. Neil D. Fleming & Colleen Mills, *DigitalCommons@University of Nebraska-Lincoln, Not Another Inventory, Rather a Catalyst for Reflection*, 11 TO IMPROVE THE ACADEMY 137, 140-41 (1992).

29. DAVID A. KOLB, *EXPERIENTIAL LEARNING: EXPERIENCE AS THE SOURCE OF LEARNING AND DEVELOPMENT* (1984); *Kolb's Learning Styles and Experiential Learning Model*, <http://www.nwlink.com/~donclark/hrd/styles/kolb.html> (last visited Apr. 9, 2013).

30. KOLB, *supra* note 29; *Kolb's Learning Styles and Experiential Learning Model*, <http://www.nwlink.com/~donclark/hrd/styles/kolb.html> (last visited Apr. 9, 2013).

als learn best when confronted with situations that force them to cross into categories outside of their comfort-zone preferences.³¹ Furthermore, research has shown that “visual thinking tools help everyone” and “people learn new material best when they encounter it multiple times and through multiple modalities.”³²

The 2012 AALS Teaching Survey did not ask specifically about learning style accommodations. However, the responses appear to reflect that law professors are following the trend of other educators to show sensitivity to the concept of presenting information in alternative modes. The highest response rate in the survey was for pedagogies using “review of problems or hypotheticals.” At 96.4%, this method was used more than lectures or Socratic question-and-answer. This may not be a surprise because many of the natural resources and environmental textbooks pioneered problem-based, instead of case-based, learning.³³

In addition, 94.5% of the professors surveyed seemed to make at least some attempt to add a visual component to their classroom teaching by employing PowerPoints, slide-shows, or videos. In addition, 36.4% used mind maps or graphic flow charts; 27.3% used in-class quizzes or polling; and 20.0% used interactive or SMART Boards. The digital technologies discussed in Part III of this Article enhance the opportunities for easily finding methods of presentation that can accommodate the needs of an array of students.

II. Use of Skills Exercises

If you study to remember, you will forget; if you study to understand, you will remember.

—Unknown³⁴

Law schools are changing. Applications and enrollments have been down over the last few years as employment opportunities look gloomy. Although calls for law school reform span more than two decades, they have become front-page news and are having serious impacts on legal education.

In 1992, the MacCrate Report formulated lists of fundamental skills and values that law schools should be teaching. The 10 skills MacCrate identified include: (1) Problem Solving; (2) Legal Analysis and Reasoning; (3) Legal Research; (4) Factual Investigation; (5) Communication; (6) Counseling; (7) Negotiation; (8) Litigation and Alternative Dispute Resolution Procedures; (9) Organization and Management of Legal Work; and (10) Recognizing

and Resolving Ethical Dilemmas.³⁵ MacCrate also identified four Fundamental Values of the legal profession.³⁶

In 2007, the Carnegie Foundation published the results of its extensive field research at law schools across the United States and Canada.³⁷ The “Carnegie Report” notes that traditional law school teaching methods, such as “Socratic case-dialogue,” have been effective for teaching legal analysis and reasoning,³⁸ but they have fallen short in addressing the many other skills and values that students need for the profession of law.³⁹ Consequently, to regain some balance as against the current emphasis on legal analysis, the Carnegie Report recommended more opportunities for teaching professional identity and practice skills throughout the law school curriculum.⁴⁰

Identity and practice skills trainings are best achieved through exercises and problems, rather than through lectures. The 2012 AALS Teaching Survey did not address professional identity, but several of the responses suggest that law professors are attempting to teach many of the legal skills identified in the MacCrate Report. For example, with respect to (1) Problem Solving, 96.4% of those responding use problems and hypotheticals as a pedagogy in class. With respect to (5) Communication, 83.6% assigned written exercises or tests outside of class time, and 43.6% used in-class writings or mid-term tests. And with respect to (8) Litigation and Alternative Dispute Resolution Procedures, 80% employed student presentations and student-led discussions in class.

In addition to addressing these skills corresponding to those identified in the MacCrate Report, the survey showed that 69.1% of those responding used simulations in class, and 50.9% used collaborations outside of class. With current pressures from employers seeking new hires who are prepared to practice as soon as they graduate from law school, we might expect to see the trend toward more skills training continue in the future.

III. Influence of Digital Technologies and the Internet

Communication on the Internet will hence no longer be limited to disembodied, linear typed messages and responses but will consist of dynamic, multisensory interactions between “re-embodied” virtual beings. All of these characteristics of cyber-life in the present and future depict a world that is universally accessible, immensely engaging, endlessly transform-

31. BRUFF, *supra* note 18.

32. *Id.* (referring to Linda Nilson’s keynote at the Lilly Conference on College Teaching at Miami University in Ohio).

33. See, e.g., CHRISTINE A. KLEIN ET AL., NATURAL RESOURCES LAW: A PLACE-BASED BOOK OF PROBLEMS AND CASES (2009).

34. The author of this quotation is unknown, as indicated on this training website for the Philippine army: http://www.army.mil.ph/Army_Sites/PAET/specialization_crse.htm (last visited Apr. 9, 2013).

35. ABA SECTION OF LEGAL EDUCATION AND ADMISSIONS TO THE BAR, REPORT OF THE TASK FORCE ON LAW SCHOOLS AND THE PROFESSION: NARROWING THE GAP, LEGAL EDUCATION AND PROFESSIONAL DEVELOPMENT—AN EDUCATIONAL CONTINUUM [hereinafter THE MACCRATE REPORT] 138-40 (July 1992).

36. Those Fundamental Values include: (1) Provision of Competent Representation; (2) Striving to Promote Justice, Fairness, and Morality; (3) Striving to Improve the Profession; and (4) Professional Self-Development. *Id.* at 140-41.

37. WILLIAM M. SULLIVAN ET AL., EDUCATING LAWYERS: PREPARATION FOR THE PROFESSION OF LAW (2007).

38. *Id.* at 5-7.

39. *Id.* at 3, 7.

40. *Id.* at 13-14.

able, unfailingly responsive, and, while removed from most physical realities, completely connected within itself.

—David Howes⁴¹

The previous two sections of this Article focused on conventional teaching methodologies and how things have progressed since Langdell's revolution in 1870. Digital technologies and electronic communications are driving a second revolution in legal education. This section will provide some glimpses into that future by addressing two areas of emerging development: (A) The Influence of Digital Technologies and the Internet Generally; and (B) Some Specific Examples.

A. Digital Technology and the Internet Generally

To most law professors, the Internet may be viewed more as an irritant than as a teaching tool, especially if students are using it during class time for purposes other than law school learning. An empirical study of students' in-class Internet behavior at St. Louis University School of Law in the fall of 2010 showed that second-year law students used the Internet for off-task behavior 42% of the entire semester.⁴² The blog reporting these results also noted that first-years were off-task approximately 35% of the time, and third-years spent approximately 28% of their time off-task.⁴³ Professor actions promoting off-task behavior included use of the Socratic Method, with its attention on only one student at a time, and calling on students in an expected order.⁴⁴

However, the blogger concluded that the percentages of individual students who were on-task at any given instant were good: 82% of third-years, 69% of first-years, and 50% of second-years.⁴⁵ Furthermore, the blog entry included some strategies that faculty can use to reduce off-task behavior, such as changing one's voice, announcing transitions, or directing the class to an item in a book, a whiteboard, or in a digital presentation.⁴⁶

As our world is increasingly inundated with digital technologies, resistance will be futile.⁴⁷ We should embrace these technologies as tools to enhance our teaching, and the 2012 AALS Teaching Survey suggests that a number of us are doing so: 89.1% use an Internet course management system, such as TWEN or Blackboard; 36.4% use on-line written discussions; and 21.8% use recorded instruction,

lectures, podcasts, or video discussions outside of classroom time.

In what ways might law professors further employ digital technologies and the Internet? The survey indicated that only 20% of natural resources and energy professors use websites that allow aggregation or sharing of teaching resources that their colleagues are providing on such websites. One such site is the Energy Prof Sharesite, hosted by the University of Denver Sturm College of Law at <http://www.law.du.edu/index.php/energy-prof-share>. This site was created in the summer of 2012 after professors who attended the Vermont Law School Teaching Energy Workshop expressed a desire to share their materials. The website is open to any professor and includes class exercises, simulations and problems, presentations, readings, syllabi, exam materials, and more.

Some educators are looking at the role of computer games in learning.⁴⁸ CALI (Computer Assisted Legal Instruction) has experimented in this area and currently has a game to teach discovery techniques and devices.⁴⁹ While CALI has no environmental law games, it has more than 30 interactive tutorials on environmental law topics.⁵⁰

Similarly, virtual worlds⁵¹ and electronic simulations have been used to help train pilots and other professionals.⁵² Law school training might also benefit from such simulations. At the 2004 CALI conference, an educator in the United Kingdom demonstrated a simulated factory accident on Second Life, a virtual world developed by Linden Lab,⁵³ which he created to train future barristers in client counseling.⁵⁴ This author is not aware of any existing simulations or virtual worlds addressing environmental and natural resource legal issues, but students can currently

41. David Howes, *e-Legislation: Law-Making in the Digital Age*, 47 MCGILL L.J. 39, 46 (2001).

42. Kim Novak Morse, *Before You Ban: Empirical Data on Student Laptop Use*, <http://bestpracticeslegaled.albanylawblogs.org/2012/02/25/before-you-ban-empirical-data-on-student-laptop-use/> (last visited Apr. 16, 2013); see also Kristen E. Murray, *Let Them Use Laptops: Debunking the Assumptions Underlying the Debate Over Laptops in the Classroom*, 36 OKLA. CITY U. L. REV. 185 (2011).

43. *Id.*

44. *Id.*

45. *Id.*

46. *Id.*

47. Star Trek: The Next Generation, Episode TNG 14—"Q—Who?", at http://www.startrek.com/database_article/borg.

48. See, e.g., PAUL MAHARG, *TRANSFORMING LEGAL EDUCATION: LEARNING AND TEACHING THE LAW IN THE EARLY TWENTY-FIRST CENTURY* (2011); SARA DE FREITAS, PAUL MAHARG EDS., *DIGITAL GAMES AND LEARNING* (2011); DAVID WILLIAMSON SHAFER, *HOW COMPUTER GAMES HELP CHILDREN LEARN* (2006).

49. CENTER FOR COMPUTER-ASSISTED LEGAL INSTRUCTION, <http://www.cali.org/> (last visited Mar. 11, 2013).

50. *Id.*

51. VIRTUAL WORLDS REVIEW, <http://www.virtualworldsreview.com/info/what-is.shtml> (last visited Apr. 9, 2013).

52. For example, United Airlines, like most airline companies, use virtual flight simulators. Andy Pasztor & Susan Carey, *United Continental Pilots Split on Training Simulators*, WALL ST. J., June 19, 2011, <http://online.wsj.com/article/SB10001424052702304887904576395850731566080.html> (last visited Apr. 9, 2013).

53. Second Life was launched in 2003, and Linden Lab won a Technology & Engineering Emmy Award for it in 2008. *Winners of 59th Technology & Engineering Emmy Awards Announced by National Television Academy at Consumer Electronics Show*, Fox Bus., Jan. 8, 2008, http://web.archive.org/web/20080112131654/http://www.foxbusiness.com/markets/industries/telecom/article/winners-59th-technology-engineering-emmy-awards-announced-national-television_428278_13.html (last visited Apr. 9, 2013). You can find the exhaustive list of Second Life worlds here: http://wiki.secondlife.com/wiki/Second_Life_Education_Directory (last visited Apr. 9, 2013). For an incomplete list of virtual worlds, see <http://arianeb.com/more3Dworlds.htm> (last visited Apr. 9, 2013). Other virtual worlds can be created using Open Grid and the Unity engines.

54. Paul Maharg, *Legal SIMS: From EverQuest to Ardcalloch (and Back Again)*, <http://w.cali.org/conference/2004/agenda.htm#FRI-1-4> (last visited Apr. 9, 2013).

tour a virtual nuclear power plant,⁵⁵ and more opportunities will no doubt become available.⁵⁶

B. Some Specific Examples

Two specific examples of the potential of digital technologies and the Internet to influence the teaching of law in the future are the flipped classroom approach and MOOCs, both described in this section.

Flipped classroom pedagogy is also called “inverted classroom” or “reverse instruction.”⁵⁷ It describes a situation in which the teacher converts what is traditionally considered classroom teaching, such as lectures, into podcasts or short videos for students to review at home. Then, students do problem-solving exercises in class that might traditionally be done for homework.⁵⁸ One of the first to popularize this approach was Salman Khan,⁵⁹ who founded the online Khan Academy.⁶⁰

One of the main advantages of a flipped classroom is that it allows students to play back, as many times as they need, those parts of lectures they did not understand the first go-round.⁶¹ Also, frustrations that students experience or incorrect learning patterns they develop can be reduced when students work on problems in the classroom while being guided by teachers or peers, as dictated by the flipped classroom model.⁶²

So far, flipped classroom teaching is a nascent method, and it is being used mostly in high-school or college-level science and math classes.⁶³ What about law schools? For the one student who is answering the professor’s questions, the Socratic Method is a type of flipped classroom experience, but it is less effective than a true flipped classroom

in which all students can be involved in active learning.⁶⁴ However, law professors are beginning to experiment with more inclusive use of the flipped classroom methodology. For example, some legal writing classes are already using the flipped approach.⁶⁵

The theme of the AALS conference in January 2013 was “Global Engagement and the Legal Academy,” and this final section addresses a phenomenon that has global repercussions—massive open online courses known as MOOCs. Although they have been evolving for a few years, the *New York Times* Education Section declared 2012 “the Year of the MOOC.”⁶⁶

Khan and Bill Gates have promoted the idea of MOOCs as “global OneWorld classrooms.”⁶⁷ Their goal is to bring down the cost of education and to make the best courses available to anyone who has access to the Internet. Thus, MOOCs can bring the best teachers from all over the world to anyone, eliminating cost, time, and distance limitations. Currently, the top three MOOC providers in the United States are Udacity, edX, and Coursera.⁶⁸

Three aspects have set MOOCs apart from previous online courses. First, their size: one Stanford course on Artificial Intelligence had enrolled 160,000 students in 190 countries.⁶⁹ Second, these courses, thus far, have been open and free, making them accessible to all as Khan and Gates envisioned.⁷⁰ Finally, these courses create unique problems with how, or whether, students may receive academic credit for their participation.⁷¹

55. Joel Warner, *With Help From the Feds, a Denver Scientist Helps Second Life Go Nuclear*, WESTWORD, Sept. 18, 2008, <http://www.westword.com/2008-09-18/news/with-help-from-the-feds-a-denver-scientist-helps-second-life-go-nuclear/> (last visited Apr. 9, 2013).

56. If you are aware of these resources or create any, the author encourages you to share them with others. You may send them to kkdudivier@law.du.edu to be posted on the Energy Prof Share website.

57. Jeremy F. Strayer, *The Effects of the Classroom Flip on the Learning Environment: A Comparison of Learning Activity in a Traditional Classroom and a Flip Classroom That Used an Intelligent Tutoring System* Dissertation 1-2, Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of the Ohio State University (2007), available at http://etd.ohiolink.edu/view.cgi?acc_num=osu1189523914.

58. See, e.g., Jane E. Cole & Jeffrey B. Kritzer, *Strategies for Success: Teaching an Online Course*, 28(4) AURAL SPECIAL EDUC. Q. 36, 38-39 (2009); *Flipping the Classroom, Hopes That the Internet Can Improve Teaching May at Last Be Bearing Fruit*, THE ECONOMIST (Oct. 16, 2011), available at <http://www.economist.com/node/21529062/print> (hereinafter *Flipping the Classroom*).

59. *How Can Videos “Flip the Classroom?”*, NPR, June 17, 2012, <http://www.npr.org/2012/06/22/155228627/how-can-videos-flip-the-classroom> (last visited Apr. 9, 2013). Some also credit Jonathan Bergmann and Aaron Sams of Woodland Park, Colorado. See, e.g., Pamela Kachka, *Should I Flip My Classroom?* (Mar. 1, 2013), <http://www.pearsonlearningsolutions.com/blog/channels/online-blended-learning/should-i-flip-my-classroom/> (last visited Apr. 9, 2013).

60. KHAN ACADEMY, <https://www.khanacademy.org/> (last visited Apr. 9, 2013).

61. Grace Hood, *More Teachers “Flipping” the School Day Upside Down*, NPR, Dec. 7, 2012, <http://www.npr.org/2012/12/07/166748835/more-teachers-flipping-the-school-day-upside-down> (last visited Apr. 9, 2013).

62. *Id.*

63. Strayer, *supra* note 57, at 61-65.

64. Paul L. Caron & Rafael Gely, *Taking Back the Law School Classroom: Using Technology to Foster Active Student Learning*, 54 J. LEGAL EDUC. 551, 554-55 (2004).

65. Robert Anderson, *How to Use a Flipped Classroom to Teach Legal Writing*, presentation at the 2013 Rocky Mountain Legal Writing Conference (Boulder, Mar. 23, 2013).

66. Laura Pappano, *The Year of the MOOC*, N.Y. TIMES, Nov. 2, 2012, http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all&_r=0 (last visited Apr. 9, 2013).

67. Salman Khan, *Let’s Use Video to Reinvent Education*, TED TALKS (Mar. 2011), http://www.ted.com/talks/salman_khan_let_s_use_video_to_reinvent_education.html (last visited Apr. 9, 2013); *The Free One-World Global Classroom*, Jan. 29, 2013, <http://schoolmoney.org/the-free-one-world-global-classroom/> (last visited Apr. 9, 2013).

68. *The Big Three, at a Glance*, N.Y. TIMES, Nov. 2, 2012, <http://www.nytimes.com/2012/11/04/education/edlife/the-big-three-mooc-providers.html> (last visited Apr. 9, 2013).

69. Tamar Lewin, *Instruction for Masses to Knock Down Campus Walls*, N.Y. TIMES, Mar. 4, 2012, http://www.nytimes.com/2012/03/05/education/moocs-large-courses-open-to-all-topple-campus-walls.html?pagewanted=all&_r=0 (last visited Apr. 9, 2013). Enrollment dropped to 30 later in the semester, but the course spawned Facebook followers and discussion groups beyond the class.

70. As with other Internet phenomena that started as free, there may eventually need to be some funding mechanism.

71. Udacity has partnered with Pearson to do a final evaluation for its courses for \$89. One of Udacity’s courses has been accepted for credit at Colorado State University. CSU Global Campus will accept Udacity’s course on search engines for credit. Katherine Mangan, *A First for Udacity: A U.S. University Will Accept Transfer Credit for One of Its Courses*, CHRON. HIGHER EDUC., Sept. 6, 2012, <http://chronicle.com/article/A-First-for-Udacity-Transfer/134162/> (last visited Apr. 9, 2013); Coursera, the platform with Stanford roots, has partnered with ACE College Credit Recommendation Service, which provides credit recommendations to 2,000 colleges and universities. They are also using web proctoring services to prevent cheating. William Oremus, *Coursera’s Big Next Step: Online College Courses for Credit, for a Fee*, SLATE, Nov. 13, 2012, http://www.slate.com/blogs/future_

Law schools are not immune from the MOOC phenomenon. Harvard and the Massachusetts Institute of Technology created the nonprofit edX in the summer of 2012, and have since added a number of additional university partners.⁷² According to the *National Law Journal*, edX sponsored the first free online law school course in the winter of 2013—featuring Prof. William Fischer III teaching copyright law.⁷³ Harvard claims the course was not a true MOOC because it did not involve thousands, but it was open to 500 students who participated in online seminars each week, as well as prerecorded lectures and guest speakers. Also, the Harvard course broke students into sections of approximately 25 people to participate in real-time discussions with facilitators.⁷⁴

Harvard may not have been the first, however. Prof. Karl Okamoto, from the Earle Mack School of Law at Drexel University, conducted a MOOC on “The Basics of Acquisition Agreements” in the fall of 2012.⁷⁵ Okamoto and others have created a website that allows one to construct one’s own similar online teaching experience, either to employ as a MOOC or to integrate into a conventional course.⁷⁶

Will MOOCs and large courses such as Harvard’s lead to “the McDonaldization of global higher education” as

Jason Lane and Kevin Kinser warn in their September 28, 2012, article in the *Chronicle of Higher Education*?⁷⁷ It is certainly food for thought.

IV. Conclusion

In 2012, “energy” was added to the name of one of the AALS sections that sponsored this program—now titled the “Section on Natural Resources and Energy Law.” Consequently, I will use an energy metaphor to wrap up this Article. Thomas Edison would recognize our current electricity delivery system. The coal-fired power plants, generators, substations, and incandescent light bulbs of Edison’s day are still in use. But just because Edison and Langdell were contemporaries does not mean that we should be teaching law only in the way we did over 100 years ago.

Research in the fields of cognitive psychology and education has given us new insights into how people process and retain knowledge. Digital technologies and the Internet have given us new tools for teaching and learning. Few law professors have expertise in psychology, education, and digital technologies, so to teach well, we still have a lot to learn.

tense/2012/11/13/online_classes_coursera_to_offer_college_credit_for_some_courses_starting.html (last visited Apr. 9, 2013); edX is sponsored by Harvard and MIT and only really offers certificates under the auspices of the universities who create the courses with “x” appended: MITx and Harvardx. 7 *Things You Should Know About MOOCs*, EDUCAUSE LEARNING INITIATIVE, Nov. 2011, available at <http://net.educause.edu/ir/library/pdf/ELI7078.pdf>; Kevin Carey, *Into the Future With MOOCs*, CHRON. HIGHER EDUC., Sept. 3, 2012, <http://chronicle.com/article/Into-the-Future-With-MOOCs/134080/> (last visited Apr. 9, 2013).

72. edX, <https://www.edx.org/>. This platform is also devoted to research about how people learn, which makes it an exciting contributor to the ongoing evolution of educational models like MOOCs.

73. Karen Sloan, *Harvard Law Offering First Free Online Courses*, NAT’L L.J., Dec. 27, 2012, http://www.law.com/jsp/nlj/PubArticleNLJ.jsp?id=1202582652536&Harvard_Law_offering_first_free_online_course&slreturn=20130210165314 (last visited Apr. 9, 2013).

74. *Id.*

75. *Law Professor Creates First Massive Open Online Course (MOOC) to Teach Business Acquisition Skills*, DREXELNOW, Sept. 17, 2012, <http://Drexel.Edu/Now/News-Media/Releases/Archive/2012/September/Law-MOOC/> (last visited Apr. 9, 2013).

76. LAWMEETS, <http://www.lawmeets.com> (last visited Apr. 9, 2013).

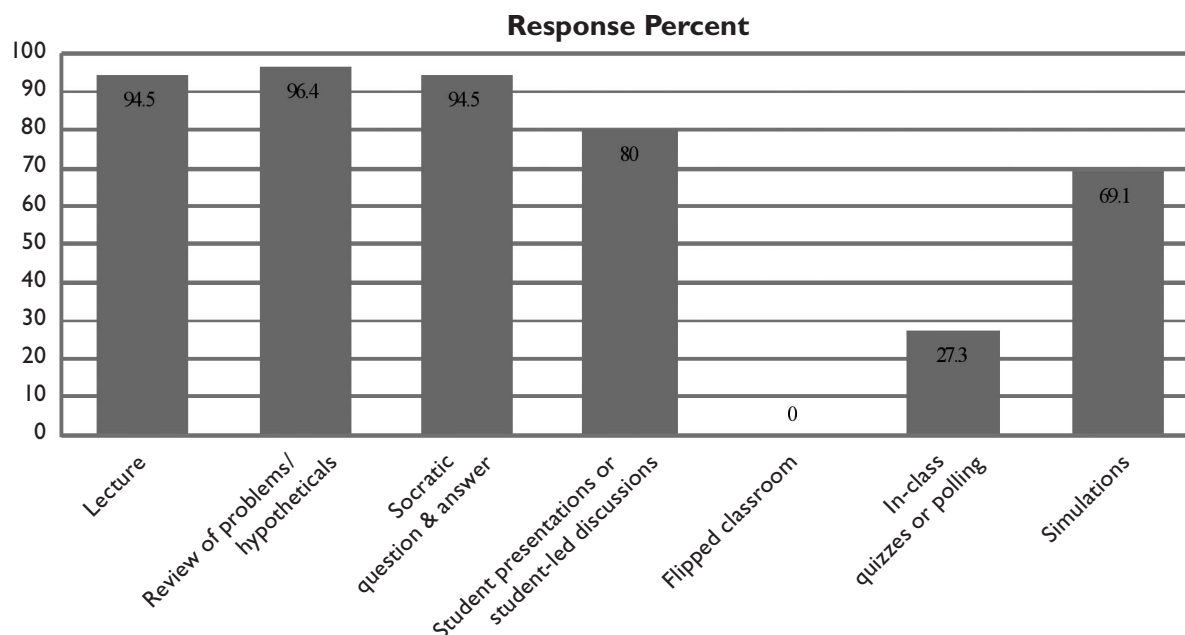
77. Jason Lane & Kevin Kinser, *MOOCs and the McDonaldization of Global Higher Education*, CHRON. HIGHER EDUC., Sept. 28, 2012, <http://chronicle.com/blogs/worldwise/moocs-mass-education-and-the-mcdonaldization-of-higher-education/30536> (last visited Apr. 9, 2013); 7 *Things You Should Know About MOOCs*, *supra* note 71; Carey, *supra* note 71; *The Big Three, at a Glance*, *supra* note 68.

APPENDIX

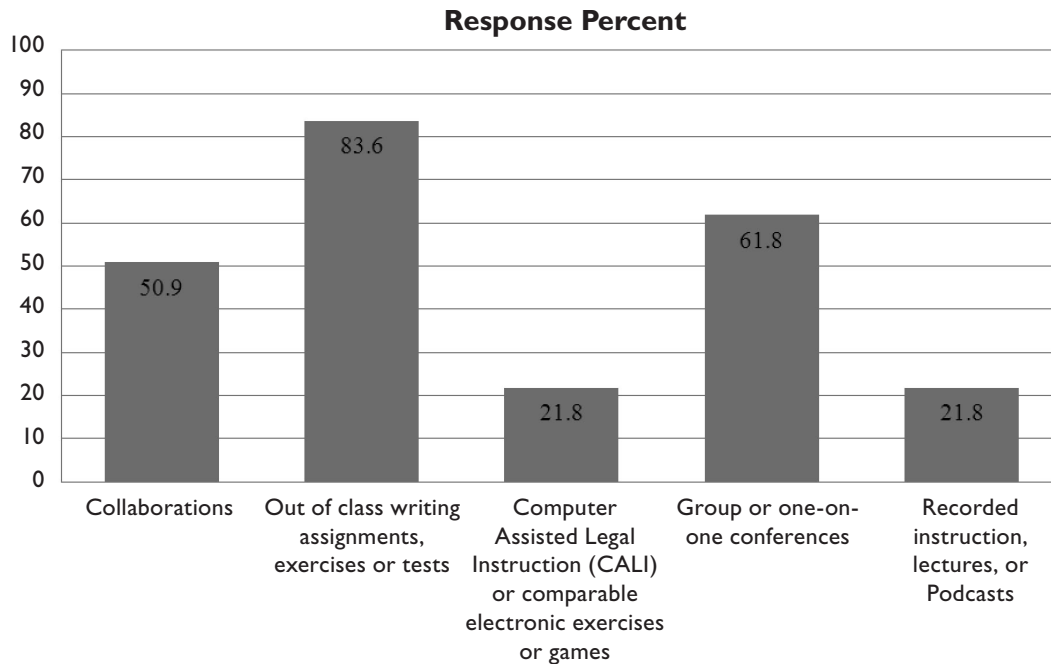
2012 AALS Teaching Survey

Results of December 2012 Survey of American Association of Law Schools Professors in the Section on Natural Resources & Energy Law for “40 Years of Environmental & Natural Resources Law—A Prospective Look” Law Teaching in the Future Program on January 7, 2013.

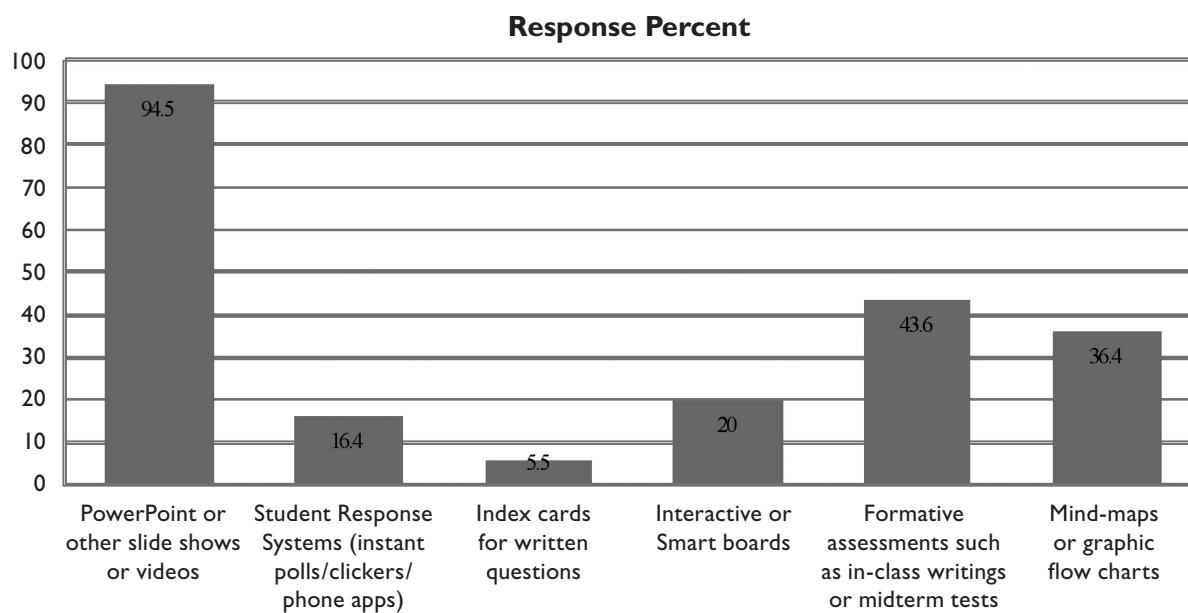
1. *For this and all of the subsequent questions, please check all answers that apply to any classes you teach, not just classes in the environment, energy, or natural resource areas. If you want to give me any feedback on the survey or have any other ideas to add, please e-mail me at kkduviver@law.du.edu. Which of the following classroom pedagogies have you used?*



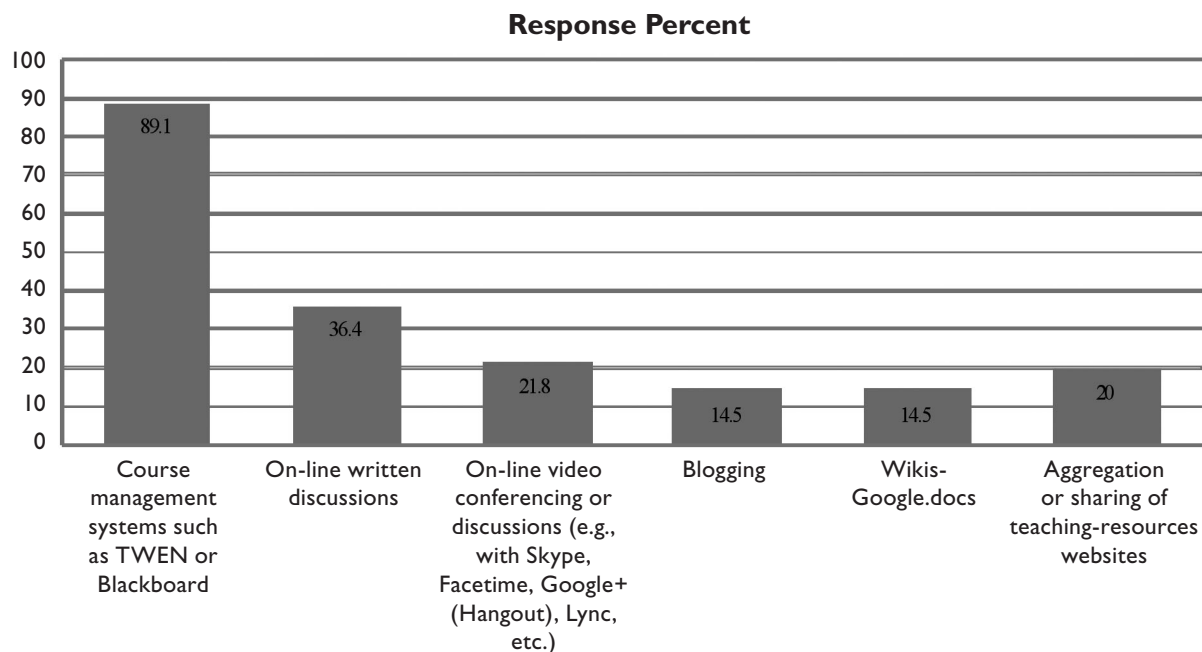
2. *Which of the following pedagogies have you used outside of classroom time?*



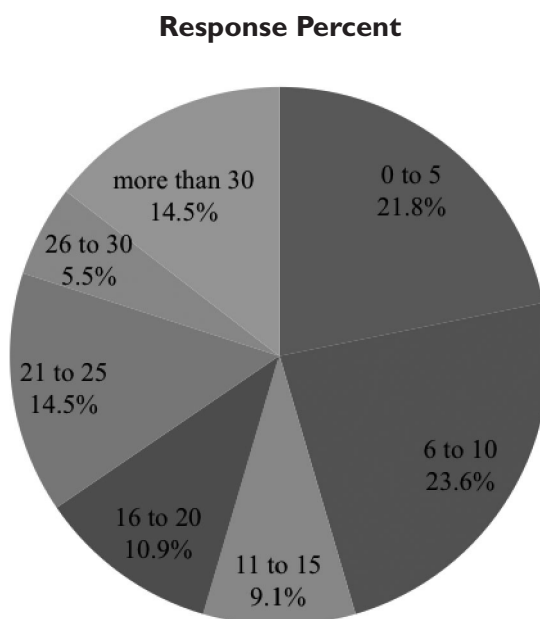
3. Which of the following tools have you used in class?



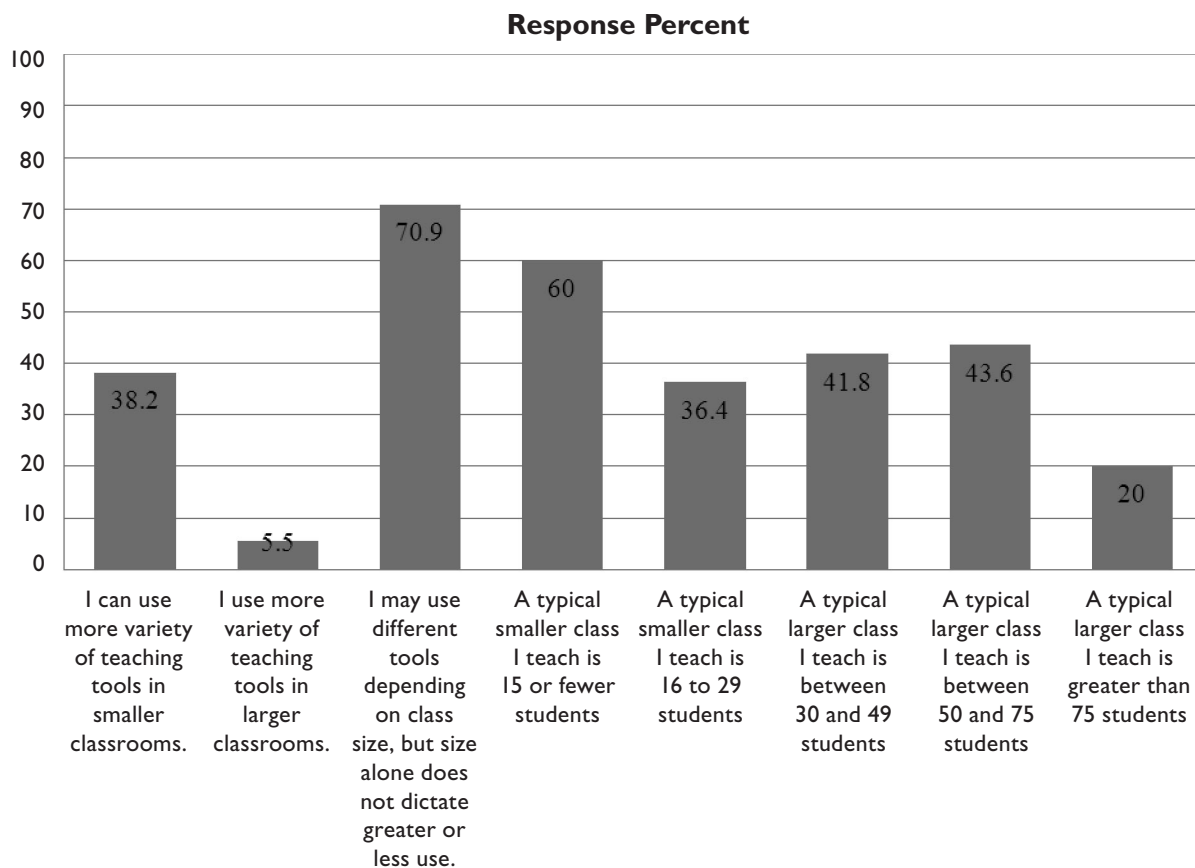
4. Which of the following electronic tools have you used outside of classroom time?



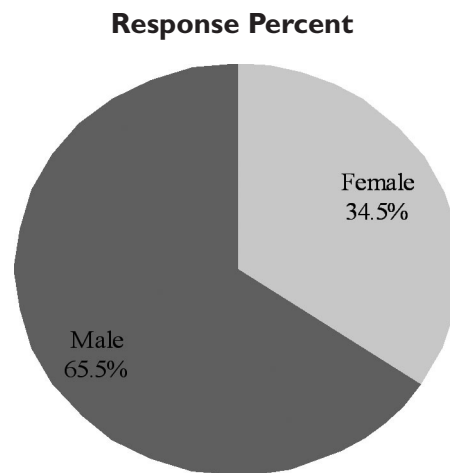
5. *Number of years you have been teaching:*



6. *Please check all of the following that apply:*



7. *What is your gender?*



8. *Is your school Private, Public, or other?*

