

## **CONTROL-ALT-INCOMPLETE? USING TECHNOLOGY TO ASSESS “DIGITAL NATIVES”**

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*Law students matriculating today were “born digital.” As digital natives, they have never known a world without digital technology, and therefore, they think and process information differently than previous generations. Although law school student bodies have changed, law school assessment methods have remained static, with students nearly universally being evaluated entirely by one exam at the end of the course. Best Practices, the Carnegie Report, and more recently the ABA, have acknowledged that this system of evaluation is contrary to learning theory and that periodic assessment of student learning is crucial to improving the performance of both students and teachers. Nevertheless, change has yet to occur.*

*It is time to change. Using technology to assess student learning is one way to begin effectuating this change. Digital natives are comfortable with technology and expect to have it integrated into the curriculum. Moreover, incorporating technology as a means to assess student learning will help prepare future lawyers for the realities of law practice today. Technology also allows law professors to conduct meaningful assessments of large numbers of students more efficiently. This article therefore introduces several examples of how to use a number of today’s technologies—both inside the classroom and outside the classroom—in the hopes of initiating further exploration into effective means of using technology to assess student learning at the course level.*

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*Today's method of teaching law students is not a model of maturation and modernization; it is older than the telephone, the game of basketball, blue jeans, and Coca-Cola.*<sup>2</sup> *Legal education's assessment systems are . . . outdated.*<sup>3</sup>

## I. INTRODUCTION

Students matriculating at law schools today are “digital natives”<sup>4</sup>—“‘native speakers’ of the digital language of computers, video games and the Internet.”<sup>5</sup> The only world that they have ever known has been digital.<sup>6</sup> Unlike the law students of the past, law students today “have always had cable, have never really thought of ‘cookies’ and ‘spam’ as just food items, have never ‘dialed’ a telephone, have never had to use a bottle of ‘White Out’—much less had to retype an entire page—before handing in a paper,” “have always used ‘Google’ as a verb, have probably never ‘rolled down’ a car window, and have never thought that ‘off the hook’ had anything to do with a telephone.”<sup>7</sup>

Growing up as native speakers of modern digital languages, law students today “think and process information fundamentally differently from their predecessors.”<sup>8</sup> They struggle to learn information in a passive,

<sup>2</sup> John O. Sonsteng et al., *A Legal Education Renaissance: A Practical Approach for the Twenty-First Century*, 34 WM. MITCHELL L. REV. 303, 318 (2007).

<sup>3</sup> *Id.* at 343.

<sup>4</sup> Marc Prensky, *Digital Natives, Digital Immigrants*, ON THE HORIZON, Oct. 2001, at 1, 1, available at <http://www.marcprensky.com/writing>. Other terms that have been used are N-[for Net]-gen or D-[for digital]-gen. *Id.*

<sup>5</sup> *Id.* “Digital Natives” are those that were “born after 1980, when social digital technologies, such as Usenet and bulletin board systems, came online.” JOHN PALFREY & URS GASSER, *BORN DIGITAL: UNDERSTANDING THE FIRST GENERATION OF DIGITAL NATIVES 1* (2008). In comparison, those born before the advent of the digital age are “Digital Immigrants,” who “will always retain [their] accents.” FRANCES JACOBSEN HARRIS, *I FOUND IT ON THE INTERNET: COMING OF AGE ONLINE* viii (2005); see Prensky, *supra* note 4, at 1-2.

<sup>6</sup> PALFREY & GASSER, *supra* note 5, at 4. Between 1999 and 2009, computer use by children and teenagers tripled. *Media Use Statistics*, MEDIA LITERACY CLEARINGHOUSE, <http://www.frankwbaker.com/mediause.htm> (last visited June 27, 2012). Between 2004 and 2009, the percent of eight to eighteen year olds who owned an iPod or other type of MP3 player jumped from eighteen percent to seventy-six percent. *Id.* Similarly, cell phone ownership increased from thirty-nine percent to sixty-six percent. *Id.*

<sup>7</sup> Camille Broussard, *Teaching with Technology: Is the Pedagogical Fulcrum Shifting?*, 53 N.Y.L. SCH. L. REV. 903, 913 (2009) (citing *The Mindset List*, BELOIT COLLEGE, <http://www.beloit.edu/mindset> (last visited June 27, 2012)).

<sup>8</sup> HARRIS, *supra* note 5, at viii; Rogelio Lasso, *From the Paper Chase to the Digital Chase: Technology and the Challenge of Teaching 21st Century Law Students*, 43 SANTA

lecture format.<sup>9</sup> Rather, they prefer to learn through interactive mediums and expect immediate feedback.<sup>10</sup> Moreover, they like to work collaboratively and embrace new technologies.<sup>11</sup>

Despite the fundamental differences of law students today, law school assessment methods have remained static. Every year, in law schools across the country, law students are evaluated entirely by one exam that is given at the end of a course.<sup>12</sup> Generally, the examination consists of hypothetical essay questions and multiple-choice questions that students must resolve by applying legal principles that they have memorized.<sup>13</sup> Students have a mere three hours to complete the examination that is the decisive assessment of their grade in the course.<sup>14</sup> Moreover, students generally receive no feedback about their performance on the exam.<sup>15</sup>

Although the single end-of-the-course exam without any feedback has been the almost universal practice in law schools since the mid-nineteenth century, the process is contrary to learning theory.<sup>16</sup> Rather,

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CLARA L. REV. 1, 19 (2002) [hereinafter *Paper Chase*] (“Students entering law school today differ from their predecessors of twenty years ago because they are very technology savvy.”). For students today, computers are “hardwired into their psyche.” Broussard, *supra* note 7, at 904 (quoting Jason Frand, *The Information Age Mindset: Changes in Students and Implications for Higher Education*, EDUCAUSE REV., Sept.-Oct. 2000, at 15, 16, available at <http://net.educause.edu/ir/library/pdf/erm0051.pdf>).

<sup>9</sup> See *infra* Part V(A) (describing digital natives).

<sup>10</sup> See *id.*

<sup>11</sup> See *id.*

<sup>12</sup> See GREGORY S. MUNRO, OUTCOMES ASSESSMENT FOR LAW SCHOOLS 34 (2000); ROY STUCKEY ET AL., BEST PRACTICES FOR LEGAL EDUCATION: A VISION AND A ROADMAP 236 (2007); WILLIAM M. SULLIVAN ET AL., EDUCATING LAWYERS: PREPARATION FOR THE PROFESSION OF LAW 162 (2007); Stephen H. Nickles, *Examining and Grading in American Law Schools*, 30 ARK. L. REV. 411, 414 (1977); Sonsteng et al., *supra* note 2, at 346 (“Law school assessment is infrequent, consisting of only one or two exams per semester.”). Legal research and writing classes are the exception, providing multiple assessment opportunities throughout the course. Cf. STUCKEY ET AL., *supra*, at 239 (“[E]xcept perhaps in legal writing and research courses, the current assessment practices used by most law school teachers are abominable.”).

<sup>13</sup> See MUNRO, *supra* note 12, at 34; STUCKEY ET AL., *supra* note 12, at 236; SULLIVAN ET AL., *supra* note 12, at 162; Nickles, *supra* note 12, at 432.

<sup>14</sup> See MUNRO, *supra* note 12, at 34; STUCKEY ET AL., *supra* note 12, at 236; SULLIVAN ET AL., *supra* note 12, at 162.

<sup>15</sup> See MUNRO, *supra* note 12, at 35; Douglas A. Henderson, *Uncivil Procedure: Ranking Law Students Among Their Peers*, 27 U. MICH. J.L. REFORM 399, 403-04 (1994); Philip C. Kissam, *Law School Examinations*, 42 VAND. L. REV. 433, 471 (1989); Christopher T. Matthews, Essay, *Sketches for a New Law School*, 40 HASTINGS L.J. 1095, 1104 (1989); Steve Sheppard, *An Informal History of How Law Schools Evaluate Students, with a Predictable Emphasis on Final Exams*, 65 UMKC L. REV. 657, 681 (1997); Morrison Torrey, *You Call That Education?*, 19 WIS. WOMEN’S L.J. 93, 98-99 (2004).

<sup>16</sup> See MUNRO, *supra* note 12, at 36 (“The irony in the fact that legal education has chosen the bluebook essay exam as its primary means of evaluation is that the instrument

learning theory<sup>17</sup> suggests that periodic assessment of student learning is crucial to improving the performance of both students and teachers.<sup>18</sup> Periodic assessment throughout a course increases academic achievement because it increases the amount of feedback that students receive.<sup>19</sup> As stated by Arthur W. Chickering and Zelda F. Gamson in the *Seven Principles of Good Practice in Undergraduate Education*,

Knowing what you know and don't know focuses learning. Students need appropriate feedback on performance to benefit from courses. When getting started, students need help in assessing existing knowledge and competence. In classes, students need frequent opportunities to perform and receive suggestions for improvement. At various points . . . students need chances to reflect on what they have learned, and what they still need to know, and how to assess themselves.<sup>20</sup>

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itself lacks a sound basis in educational or assessment principles.”); Henderson, *supra* note 15, at 412 (“[R]eflection on subject matter—and better yet, periodic assessment combined with reflection—provides essential feedback for the learning process.”); Nickles, *supra* note 12, at 412 (“[T]he typical process of evaluation in our law schools is composed of procedures and techniques which have been discredited by research in education and psychology.”). The current one exam at the end of the course approach “function[s] less as a means for measuring student learning than as a means for sorting and ranking students and for ‘weeding out’ students who are not developing the requisite knowledge, skills, and values to pass a bar examination.” STUCKEY ET AL., *supra* note 12, at 236.

<sup>17</sup> Learning theory is defined as “the science of how people learn.” Cathaleen A. Roach, *A River Runs Through It: Tapping into the Informational Stream to Move Students from Isolation to Autonomy*, 36 ARIZ. L. REV. 667, 680 (1994).

<sup>18</sup> See SULLIVAN ET AL., *supra* note 12, at 171. Assessment methods and requirements have a greater influence on how and what students learn than any other single factor. *Id.* at 243 (quoting ALISON BONE, ENSURING SUCCESSFUL ASSESSMENT 2 (Roger Burrige & Tracey Varnava eds., 1999), available at <http://www.ukcle.ac.uk/resources/assessment-and-feedback/bone/> (last visited June 27 2012)). Assessment has been defined as “a coordinated set of formative practices that, by providing important information about the student’s progress in learning to both students and faculty, can strengthen law schools’ capacity to develop competent and responsible lawyers.” SULLIVAN ET AL., *supra* note 12, at 171.

<sup>19</sup> See Ron M. Aizen, *Four Ways to Better 1L Assessments*, 54 DUKE L.J. 765, 777 (2004); Robert C. Downs & Nancy Levit, *If It Can’t Be Lake Woebegone . . . A Nationwide Survey of Law School Grading and Grade Normalization Practices*, 65 UMKC L. REV. 819, 823 (1997) (“A single examination followed by a course grade prevents professors from giving students repeated feedback, which many theorists say is essential to deep learning.”); James D. Gordon III, *How Not to Succeed in Law School*, 100 YALE L.J. 1679, 1692 (1991) (“Studies have shown that the best way to learn is to have frequent exams on small amounts of material and to receive lots of feedback from the teacher.”).

<sup>20</sup> Arthur W. Chickering & Zelda F. Gamson, *Seven Principles for Good Practice in Undergraduate Education*, AAHE BULL., Mar. 1987, at 5.

Frequent and varied assessment of student learning is essential to the learning process because it allows the professor to determine whether the students “are learning what [the professor] want[s] them to learn,”<sup>21</sup> which in turn “can strengthen law schools’ capacity to develop competent and responsible lawyers.”<sup>22</sup>

Despite the abundance of literature regarding learning theory and the role of assessments, law schools still rely on the end-of-the-course exam. Therefore, “[a]ssessment, as defined for purposes of improving student learning and enhancing institutional effectiveness, is woefully inadequate in law schools.”<sup>23</sup> Accordingly, law schools are failing in their mission of fostering learning and “mak[ing] sure students are learning the skills they need to think, perform, and conduct themselves as competent lawyers.”<sup>24</sup>

Recognizing this disconnect, the American Bar Association (“ABA”) is currently addressing assessment in law schools.<sup>25</sup> Specifically, the ABA Section on Legal Education and Admissions to the Bar Standards Review Committee is in the process of proposing revisions to the Standards for Approval for Law Schools (“Accreditation Standards”) that would emphasize outcome measures.<sup>26</sup> An emphasis on outcome measures would

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<sup>21</sup> STUCKEY ET AL., *supra* note 12, at 236.

<sup>22</sup> SULLIVAN ET AL., *supra* note 12, at 171.

<sup>23</sup> MUNRO, *supra* note 12, at 33; see Andrea A. Curcio, *Assessing Differently and Using Empirical Studies to See If It Makes a Difference: Can Law Schools Do It Better?*, 27 QUINNIAC L. REV. 899, 899 (2009) (“These assessment methods have repeatedly been critiqued as an inadequate and inaccurate way to develop and assess the skills and values that new lawyers need to practice law competently.”).

<sup>24</sup> Rogelio A. Lasso, *Is Our Students Learning? Using Assessments to Measure and Improve Law School Learning and Performance*, 15 BARRY L. REV. 73, 75 (2010) [hereinafter *Students Learning*]; see MUNRO, *supra* note 12, at 68-69 (noting the primary purpose of law school is student learning); HERBERT L. PACKER & THOMAS EHRlich, NEW DIRECTIONS IN LEGAL EDUCATION 22 (1972) (asserting law schools purpose is to prepare students for the legal profession); SULLIVAN ET AL., *supra* note 12, at 22 (stating the aim of professional education is to teach novice practitioners to perform like professionals). Every legal institution asserts that preparing law students for practice is one of its principal objectives. See, e.g., John O. Mudd, *Beyond Rationalism: Performance-Referenced Legal Education*, 36 J. LEGAL EDUC. 189, 191 (1986). Some commentators even suggest that preparing students to become good lawyers is the primary role of legal education. See, e.g., ROBERT B. STEVENS, LAW SCHOOL: LEGAL EDUCATION IN AMERICA FROM THE 1850S TO THE 1980S 720 (1983); Paul Brest, *Plus Ça Change*, 91 MICH. L. REV. 1945, 1945 (1993) (stating the “primary aim [of law school] is to prepare students to become skillful and responsible practicing lawyers, policymakers, and judges.”).

<sup>25</sup> See Susan Hanley Duncan, *The New Accreditation Standards Are Coming to a Law School Near You—What You Need to Know About Learning Outcomes & Assessment*, 16 LEGAL WRITING: J. LEGAL WRITING INST. 605, 608 (2010).

<sup>26</sup> See ABA Sec. Leg. Educ. & Admis. to B., Standards Review Committee, *Standards Review Documents Chapters 1-7* (2011) [hereinafter *Standards Review Documents*]

require law schools to in essence abandon the one exam at the end of the semester approach as the only means of assessment and to assess student learning and provide feedback to students throughout the course.<sup>27</sup> While the ABA has not yet changed the Accreditation Standards, it is highly likely that the ABA will revise the Accreditation Standards to require some sort of assessment planning in the future.<sup>28</sup>

This article argues that in light of these projected revisions and the recognition that the twenty-first century law student has been reared almost entirely on digital information, legal educators should use technology to assess student learning.<sup>29</sup> Specifically, this article focuses on the use of technology to assess student learning throughout the semester rather than simply administering one exam at the end of the course.<sup>30</sup> Part II provides some background about law schools' emphasis on input measures and the push to move to outcome measures. Subsequently, Part III discusses assessment of student learning at the course level. Part IV addresses why law professors should use technology to assess student learning and provide feedback. Part V then offers a discussion of some approaches to using technology to assess student learning at the course level. Finally, Part VI provides a brief conclusion.

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<sup>27</sup> *See Standards Review Documents, supra* note 26; *Student Learning Outcomes, supra* note 26.

<sup>28</sup> *See* Victoria L. VanZandt, *Creating Assessment Plans for Introductory Legal Research and Writing Courses*, 16 LEGAL WRITING: J. LEGAL WRITING INST. 313, 316 (2010).

<sup>29</sup> This article, however, is not arguing that professors should only use technology to assess student learning.

<sup>30</sup> *See infra* Part V (discussing various technologies that professors can use to assess student learning and provide feedback). This article does not engage in the debate regarding the use of technology to teach students. *See, e.g.,* Paul L. Caron & Rafael Gely, *Taking Back the Law School Classroom: Using Technology to Foster Active Student Learning*, 54 J. LEGAL EDUC. 551, 551 (2004). Rather, the focus here is on pedagogically appropriate ways to use technology to assess student learning in an effort to improve student learning.

## II. LAW SCHOOLS' FOCUS ON INPUT MEASURES AND THE PUSH TO EMPHASIZE OUTCOME MEASURES

The prevalence of one exam at the end of the semester with little or no feedback is, in part, a reflection of law schools' traditional focus on input measures at both the institutional level and student level. At the institutional level, this is reflected by the ABA's current Accreditation Standards' focus on the resources that law schools invest to attain the goals set forth in both the school's mission and the Accreditation Standards.<sup>31</sup> At the student level, the law schools' input-based model focuses on the topics covered and the types of instruction provided rather than on what students should have learned by the time they graduate.<sup>32</sup>

This traditional focus of law schools on inputs at the student level is inconsistent with learning theory that advocates focusing on outcome measures.<sup>33</sup> Unlike input measures, which focus on the material provided to students, outcome measures focus on what the students have learned from the educational experience.<sup>34</sup> Accordingly, pursuant to outcome measures, the professor's role is not simply to deliver information.<sup>35</sup> Rather, the professor's role is "to design effective learning experiences so that students achieve the course outcomes and to monitor student learning in order to continuously improve their experiences."<sup>36</sup> This translates into providing multiple assessment opportunities throughout the semester rather than a

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<sup>31</sup> See, e.g., ABA Sec. Leg. Educ. & Admis. to B., Chapter 7, available at [http://www.americanbar.org/content/dam/aba/publications/misc/legal\\_education/Standards/2011\\_2012\\_aba\\_standards\\_chapter7.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/publications/misc/legal_education/Standards/2011_2012_aba_standards_chapter7.authcheckdam.pdf); Standard 402, available at [http://www.americanbar.org/content/dam/aba/publications/misc/legal\\_education/Standards/2011\\_2012\\_aba\\_standards\\_chapter4.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/publications/misc/legal_education/Standards/2011_2012_aba_standards_chapter4.authcheckdam.pdf); Standards 201 & 210, available at [http://www.americanbar.org/content/dam/aba/publications/misc/legal\\_education/Standards/2011\\_2012\\_aba\\_standards\\_chapter2.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/publications/misc/legal_education/Standards/2011_2012_aba_standards_chapter2.authcheckdam.pdf). Current Standards also require specific courses and topics to be taught. See ABA Sec. Leg. Educ. & Admis. to B., Standard 302, available at [http://www.americanbar.org/content/dam/aba/publications/misc/legal\\_education/Standards/2011\\_2012\\_aba\\_standards\\_chapter3.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/publications/misc/legal_education/Standards/2011_2012_aba_standards_chapter3.authcheckdam.pdf).

<sup>32</sup> See Robert B. Barr & John Tagg, *From Teaching to Learning*, CHANGE, Nov.-Dec. 1995, at 13, 16, 19-20; Fisher, *supra* note 26, at 228. Pursuant to the traditional input measures, the purpose of law school is to transfer information from professor to student. See Barr & Tagg, *supra*, at 13, 19-20.

<sup>33</sup> See Barr & Tagg, *supra* note 32, at 20. It is inconsistent with learning theory because a focus on input measures does not "provide for, warrant or reward assessing whether student learning has occurred or is improving." *Id.*

<sup>34</sup> See BARBARA E. WALVOORD, ASSESSMENT CLEAR AND SIMPLE 3 (2004); Barr & Tagg, *supra* note 32, at 13.

<sup>35</sup> See Barr & Tagg, *supra* note 32, at 24.

<sup>36</sup> *Id.*

single exam at the end of the semester.

Although law schools have only just begun to think seriously about outcomes and assessment,<sup>37</sup> a focus on outcomes “is neither new [n]or a fad.”<sup>38</sup> A few groundbreaking undergraduate institutions began redesigning their curriculum to embrace assessment practices and outcomes nearly forty years ago.<sup>39</sup> Educators and the public recognized the benefits of assessment in higher education by the mid-1980s.<sup>40</sup> By 1995, over 90% of undergraduate institutions employed some type of assessment.<sup>41</sup>

Consideration of effective assessment practices and a focus on outcome measures is not only prevalent in undergraduate institutions. In addition to undergraduate education, other fields of professional education focus on outcome measures and embrace assessment practices.<sup>42</sup> Accreditors of legal education in foreign countries also employ outcome measures.<sup>43</sup>

While legal education in the United States has lagged behind other fields of professional education and legal education in other countries, in recent years it has started to concentrate on the topic of outcome measures and assessment.<sup>44</sup> The publications of *Educating Lawyers: Preparation for the Profession of Law*,<sup>45</sup> written by the Carnegie Foundation for the Advancement of Teaching (“Carnegie Report”), and *Best Practices for*

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<sup>37</sup> See MUNRO, *supra* note 12, at 50 (“There is little evidence that legal educators in this century have thought seriously about outcomes.”).

<sup>38</sup> *Id.* at 5.

<sup>39</sup> See CATHERINE A. PALOMBA & TRUDY W. BANTA, *ASSESSMENT ESSENTIALS 1* (1999). The undergraduate institutions include Alverno College and the University of Tennessee at Knoxville. *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

<sup>42</sup> ABA Sec. Leg. Educ. & Admis. to B., *Report of the Outcome Measures Committee* 20-24 (July 27, 2008) [hereinafter *Outcome Measures Report*], available at [http://apps.americanbar.org/legaled/committees/subcomm/Outcome Measures Final Report.pdf](http://apps.americanbar.org/legaled/committees/subcomm/Outcome%20Measures%20Final%20Report.pdf).

Currently, the majority of professional education accrediting bodies employ outcome measures in their standards. *See id.* (noting professional education accrediting bodies employ outcome measures in standards in the following fields: allopathic and osteopathic medicine, dentistry, veterinary medicine, pharmacy, psychology, teaching, engineering, accounting, and architecture). In 1988, dental education accreditors were the first to adopt outcome measures. *See id.* at 20.

<sup>43</sup> See STUCKEY ET AL., *supra* note 12, at 45 (noting that Scotland, Northern Ireland, England, and Wales have adopted outcome measures).

<sup>44</sup> See STUCKEY ET AL., *supra* note 12, at 235-74; SULLIVAN ET AL., *supra* note 12, at 162-84.

<sup>45</sup> SULLIVAN ET AL., *supra* note 12. In the Carnegie Report, the authors propose that legal education should focus on three apprenticeships: (1) knowledge, (2) skill, and (3) identity and purpose. *See id.* at 12-14, 27-28.



*Legal Education: A Vision and a Road Map*<sup>46</sup> (“*Best Practices*”) in 2007 fueled this change in focus.<sup>47</sup> Both reports assert undeniably that the current system of legal education in the United States needs to change because “most law school graduates are not as prepared for law practice as they could be and should be.”<sup>48</sup> Accordingly, these reports put forward an extensive array of suggestions on how legal education in the United States can be improved to better prepare students to practice as competent and ethical lawyers.<sup>49</sup> One change is to move from a focus on input measures to a focus on outcome measures with numerous opportunities for assessment of student learning rather than reliance on one end-of-the-course exam.<sup>50</sup>

The recommendations of the Carnegie Report and *Best Practices* make plain that the push to switch the focus to outcome measures in law

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<sup>46</sup> STUCKEY ET AL., *supra* note 12. *Best Practices* is the culmination of a study that law professors conducted to assess law schools’ effectiveness at preparing students to practice law. *See id.* at vii-ix; Benjamin V. Madison, *The Elephant in Law School Classrooms: Overuse of the Socratic Method as an Obstacle to Teaching Modern Law Students*, 85 U. DET. MERCY L. REV. 293, 298 (2008) (describing motivation for *Best Practices* research initiative).

<sup>47</sup> *See Outcome Measures Report*, *supra* note 42, at 5-6.

<sup>48</sup> STUCKEY ET AL., *supra* note 12, at 7; *see generally* SULLIVAN ET AL., *supra* note 12; *see also* Antoinette Sedillo Lopez, *Leading Change in Legal Education—Educating Lawyers and Best Practices: Good News for Diversity*, 31 SEATTLE U. L. REV. 775, 775 (2008).

*Best Practices* stresses that changes are necessary in legal education because “most law school graduates lack the minimum competencies required to provide effective and responsible legal services.” STUCKEY ET AL., *supra* note 12, at 1-2. In the Introduction, *Best Practices* continues by stating that “[l]aw schools do some things well, but they do some things poorly or not at all. While law schools help students acquire some the essential skills and knowledge required for law practice, most law schools are not committed to preparing students for practice.” *Id.*

<sup>49</sup> *See generally* STUCKEY ET AL., *supra* note 12; SULLIVAN ET AL., *supra* note 12 at 185-202; *see also* Harriet N. Katz, *Evaluating the Skills Curriculum: Challenges and Opportunities for Law School*, 59 MERCER L. REV. 909, 911 (2008) (noting *Best Practices* provides a “comprehensive guide to excellence in teaching in both doctrinal and experiential courses”).

<sup>50</sup> *See* STUCKEY ET AL., *supra* note 12, at 235-73; SULLIVAN ET AL., *supra* note 12, at 162-84; *see also* Emily Zimmerman, *An Interdisciplinary Framework for Understanding and Cultivating Law Student Enthusiasm*, 58 DEPAUL L. REV. 851, 881 (2009) (discussing negative repercussions of employing a single end of the course exam as the only assessment measure).

The authors of the Carnegie Report explain that “[f]rom our observations, we believe that assessment should be understood as a coordinated set of formative practices that, by providing important information about the students’ progress in learning to both students and faculty, can strengthen law schools’ capacity to develop competent and responsible lawyers.” SULLIVAN ET AL., *supra* note 12, at 171. According to the authors of *Best Practices*, assessment methods have the largest impact on how and what students learn. STUCKEY ET AL., *supra* note 12, at 235.

schools is not entirely new. Nevertheless, as a general rule, law schools to date have not been required to change their traditional ways, and therefore, few, if any, have implemented the changes recommended by the Carnegie Report and *Best Practices* regarding assessment practices.<sup>51</sup> There is much speculation as to why law schools and its faculty members are resistant to switching to a learning-outcomes approach. Some reasons include concern about academic freedom,<sup>52</sup> trepidation that it will lead to faculty members being blamed unfairly,<sup>53</sup> resistance to changing the status quo, and hesitation over making a change that would require them to work harder,<sup>54</sup> to name a few.<sup>55</sup>

The push to switch to outcome measures and a culture of assessment is finally gaining some traction with the Council of the ABA Section on Legal Education and Admissions to the Bar, the national accrediting agency of law schools.<sup>56</sup> Currently, the accreditation process is being used to incorporate assessment into legal education.<sup>57</sup> The first thing that the Chair of the ABA Section on Legal Education and Admissions to the Bar did, in 2007, was to appoint the Special Committee on Outcome Measures and charged them to

determine whether and how we can use output measures, other than bar passage and job placement, in the accreditation process . . . consider methods to measure whether a program is accomplishing its stated mission and goals . . . and define appropriate output measures and make specific recommendations as to whether the section should adopt those measures as part of the standards.<sup>58</sup>

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<sup>51</sup> See Karen Sloan, *Reality's Knocking*, NAT'L L.J., Sept. 7, 2009, at 18.

<sup>52</sup> See MARY J. ALLEN, ASSESSING ACADEMIC PROGRAMS IN HIGHER EDUCATION 7 (2004); WALVOORD, *supra* note 34, at 8-9.

<sup>53</sup> See ALLEN, *supra* note 52, at 7; WALVOORD, *supra* note 34, at 8-9; Duncan, *supra* note 25, at 609.

<sup>54</sup> See Duncan, *supra* note 25, at 610.

<sup>55</sup> See *id.* at 609-10 (listing numerous objections). Some faculty members "find the call to student outcomes assessment threatening, insulting, intrusive, and wrongheaded." ALLEN, *supra* note 52, at 13; see WALVOORD, *supra* note 34, at 9-10 (articulating that professors "might question whether the real goals of higher education can be measured or argue that student learning is affected by factors beyond faculty control").

<sup>56</sup> See Roy Stuckey, "*Best Practices*" or Not, *It Is Time to Re-Think Legal Education*, 16 CLINICAL L. REV. 307, 312 (2009). The U.S. Department of Education recognizes the Council of the ABA Section on Legal Education and Admissions to the Bar as the national accrediting agency of law schools. See *id.*

<sup>57</sup> See VanZandt, *supra* note 28, at 314; *infra* notes 58-72 and accompanying text (addressing recent activities of the ABA regarding assessments).

<sup>58</sup> *Outcome Measures Report*, *supra* note 42, at 1.

After conducting extensive research, the Outcome Measures Committee filed its report in July 2008.<sup>59</sup> In this report, the Outcome Measures Committee recommended “that the Section on Legal Education and Admissions to the Bar reexamine the current ABA Accreditation Standards and reframe them, as needed, to reduce their reliance on input measures and instead adopt a greater and more overt reliance on outcome measures.”<sup>60</sup>

The ABA’s Section on Legal Education and Admissions to the Bar’s Standards Review Committee responded to this Outcome Measures Committee recommendation by creating the Student Learning Outcomes Subcommittee. This subcommittee was charged with the task of drafting revisions to Chapter 3 of the Accreditation Standards.<sup>61</sup> Looking to the Report of the Outcome Measures Committee<sup>62</sup> for guidance, the Student Learning Outcomes Subcommittee drafted proposed revisions to the Accreditation Standards and Interpretations that would shift law schools’ focus from teaching to student learning and from curriculum to outcomes.<sup>63</sup>

As of February 2012, the proposed revisions to Chapter 3 of the ABA Accreditation Standards would compel law schools to “identify . . . learning outcomes it seeks for its graduating students and for its program of legal education,”<sup>64</sup> “offer a curriculum that is designed to produce graduates who have attained competency in the learning outcomes,”<sup>65</sup> “apply a variety of formative and summative assessment methods across the curriculum to provide meaningful feedback to students,”<sup>66</sup> “conduct regular, ongoing assessment of whether [their] learning outcomes, curriculum and delivery, assessment methods and the degree of student attainment of competency in the learning outcomes are sufficient to ensure that its students are prepared to participate effectively, ethically, and responsibly as entry level practitioners in the legal profession,” and finally, to “use the results of this review to improve its curriculum and its delivery.”<sup>67</sup>

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<sup>59</sup> See generally *id.* In drafting its report, the Committee looked to the material on outcome measures in the Carnegie Report and *Best Practices*. See *id.* at 5-6. In addition, the trend towards outcome measures in undergraduate education and the use of outcome measures in the accreditation process of other fields of professional education prompted the Committee to recommend a shift from the focus on teaching to a focus on student learning. *Id.* at 5-13.

<sup>60</sup> *Id.* at 1.

<sup>61</sup> See *Student Learning Outcomes*, *supra* note 26.

<sup>62</sup> *Outcome Measures Report*, *supra* note 42.

<sup>63</sup> See *Student Learning Outcomes*, *supra* note 26. The revisions reflect some of the changes proposed in *Best Practices* and the Carnegie Report. See *id.*; *Outcome Measures Report*, *supra* note 42, at 6.

<sup>64</sup> See *Standards Review Documents*, *supra* note 26, at Standard 302.

<sup>65</sup> *Id.* at Standard 304.

<sup>66</sup> *Id.* at Standard 305.

<sup>67</sup> *Id.* at Standard 306.

Currently, these proposed revisions to Chapter 3 of the Accreditation Standards would compel law schools to comply with a four-step process.<sup>68</sup> The first step entails identifying learning outcomes.<sup>69</sup> The second step requires that law schools provide a curriculum that enables students to achieve these outcomes.<sup>70</sup> The third step necessitates the assessment of learning outcomes to ascertain if the curriculum is meeting the learning objectives identified in step one.<sup>71</sup> The fourth and final step then obliges law schools to assess the assessment and revise based upon the feedback gathered.<sup>72</sup> While these four steps apply at the institutional, programmatic, and course levels,<sup>73</sup> this article focuses on the third step—designing and using assessment measures—to assess student learning at the course level.

### III. ASSESSMENT OF STUDENT LEARNING AT THE COURSE LEVEL

Although the proposed revisions to Chapter 3 discussed above indicate that “[a] law school need not apply a variety of assessment

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<sup>68</sup> See Duncan, *supra* note 25, at 611; VanZandt, *supra* note 28, at 349-52. This four-step process mirrors an instructional design process known as “backwards design.” GRANT WIGGINS & JAY MCTIGHE, UNDERSTANDING BY DESIGN 29 (highlighted & notations ed., Assn. for Supervision & Dev. 1998); see also PATRICIA L. SMITH & TILLMAN J. RAGAN, INSTRUCTIONAL DESIGN 70, 134 (3d ed. 2005); LINDA SUSKIE, ASSESSING STUDENT LEARNING 4 (2004).

<sup>69</sup> See *Standards Review Documents*, *supra* note 26, at Standard 302; see Duncan, *supra* note 25, at 612-16; Gregory S. Munro, *How Do We Know If We Are Achieving Our Goals?: Strategies for Assessing the Outcome of Curricular Innovation*, 1 J. ASS'N LEGAL WRITING DIRECTORS 229, 232 (2002); VanZandt, *supra* note 28, at 322-36.

<sup>70</sup> See *Standards Review Documents*, *supra* note 26, at Standard 304; see also MUNRO, *supra* note 12, at 139-51; STUCKEY ET AL., *supra* note 12, at 105-234; Duncan, *supra* note 25, at 616-22; Munro, *supra* note 69, at 233-36; VanZandt, *supra* note 28, at 336-37.

<sup>71</sup> See *Standards Review Documents*, *supra* note 26, at Standard 305; see also STUCKEY ET AL., *supra* note 12, at 235-63; Duncan, *supra* note 25, at 622-27; Munro, *supra* note 69, at 236-44; VanZandt, *supra* note 28, at 337-49.

<sup>72</sup> See *Standards Review Documents*, *supra* note 26, at Standard 306; see Duncan, *supra* note 25, at 626-31; Munro, *supra* note 69, at 244-46; VanZandt, *supra* note 28, at 349-52.

<sup>73</sup> See LINDA SUSKIE, ASSESSING STUDENT LEARNING 6-10 (2d ed. 2009) (comparing institutional, programmatic, and course level assessment); Fisher, *supra* note 26, at 229-42; VanZandt, *supra* note 28, at 320. Assessment at the institutional or programmatic level is a “process that provides meaningful feedback to faculty, staff, and various publics about patterns of student and alumnae performance on a range of curriculum outcomes.” MUNRO, *supra* note 12, at 12 (quoting ALVERNO COLLEGE FACULTY, STUDENT ASSESSMENT-AS-LEARNING, AT ALVERNO COLLEGE 3 (1994)). Student assessment at the course level is a “process, integral to learning, that involves observation and judgment of each student’s performance on the basis of explicit criteria, with resulting feedback to the students.” *Id.*

measures in each individual course,”<sup>74</sup> assessment of student learning at the course level could transform the manner in which law students receive a legal education in the United States. These revisions could potentially drive the push to dispense with the traditional means of assessing law students based on a single exam at the end of the course.<sup>75</sup> Rather, professors would develop multiple assessment measures to assess student performance and provide feedback consistent with contemporary learning theory.

Assessment of student learning at the course level is the “process of evaluating students’ attainment of defined learning outcomes” in an individual law school course and providing the students with feedback.<sup>76</sup> Assessment of student learning at the course level focuses on student learning—rather than on teaching—concentrating on whether the students in the course are actually mastering the outcomes that have been identified for the course.<sup>77</sup> Pursuant to the four steps set forth above, a professor would (1) identify and define the desired course outcomes; (2) examine course content and develop a strategy to teach the material so that students can accomplish the learning outcomes; (3) design assessment measures to assess whether the students are achieving the learning outcomes; and (4) analyze the assessment data and make any necessary changes based upon the data gathered.<sup>78</sup>

Course-based assessment focuses on the professor’s use of multiple assessment measures to ascertain what students are learning in the course.<sup>79</sup> An assessment measure is “an activity, assigned by the professor, that yields comprehensive information for analyzing, discussing, and judging a learner’s performance of valued abilities and skills.”<sup>80</sup> An effective assessment instrument allows both the professor and the student to

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<sup>74</sup> See *Student Learning Outcomes*, *supra* note 26, at Standard 304, Interpretation 304-2.

<sup>75</sup> See *supra* notes 12-15 and accompanying text (discussing traditional means of assessing student learning in law school).

<sup>76</sup> VanZandt, *supra* note 28, at 320; see generally THOMAS A. ANGELO & K. PATRICIA CROSS, *CLASSROOM ASSESSMENT TECHNIQUES: A HANDBOOK FOR COLLEGE TEACHERS* (2d ed. 1993) (discussing classroom assessment).

<sup>77</sup> Sarah L. Stone & Donna M. Qualters, *Course-Based Assessment: Implementing Outcome Assessment in Medical Education*, 73 *ACAD. MEDICINE* 397, 397-98 (1998).

<sup>78</sup> See *supra* notes 68-72 and accompanying text. As noted above, this article focuses on the third step, designing assessment measures to assess whether students are attaining the learning outcomes at the course level.

<sup>79</sup> See K. PATRICIA CROSS, *FEEDBACK IN THE CLASSROOM: MAKING ASSESSMENT MATTER* 5 (1988).

<sup>80</sup> Kristin B. Gerdy, *Teacher, Coach, Cheerleader, and Judge: Promoting Learning Through Learner-Centered Assessment*, 94 *LAW LIBR. J.* 59, 69 (2002); see MARY HUBA & JANN E. FREED, *LEARNER-CENTERED ASSESSMENT ON COLLEGE CAMPUSES: SHIFTING THE FOCUS FROM TEACHING TO LEARNING* 9 (2000).

determine whether the student is learning the material.<sup>81</sup>

An assessment measure is only effective if it is valid,<sup>82</sup> fair,<sup>83</sup> and reliable.<sup>84</sup> To be valid, an assessment measure must assess whether the students are learning what the professor is teaching in the course.<sup>85</sup> A fair assessment is one that is “equitable in terms of both process and results.”<sup>86</sup> Finally, a reliable assessment tool is one that “accurately rate[s] those who have learned as having learned and those who have not learned as having not learned.”<sup>87</sup>

To ensure reliable assessment measures, legal educators should avoid norm-referenced assessments<sup>88</sup> and focus on conducting assessments that are criteria-referenced.<sup>89</sup> Unlike norm-referenced assessments that simply notify students how they have performed relative to their classmates,<sup>90</sup> criteria-based assessments assist students in gauging whether

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<sup>81</sup> See Gerdy, *supra* note 80, at 69.

<sup>82</sup> See STUCKEY ET AL., *supra* note 12, at 241; *infra* note 85 and accompanying text (describing valid assessment measures).

<sup>83</sup> See MUNRO, *supra* note 12, at 105; *infra* note 86 and accompanying text (describing fair assessment measures). An evaluation is fair if it assesses whether students have accomplished the course objectives. See BARBARA GROSS DAVIS, *TOOLS FOR TEACHING* 240-41 (1993); LUCY CHESER JACOBS & CLINTON I. CHASE, *DEVELOPING AND USING TESTS EFFECTIVELY: A GUIDE FOR FACULTY* 5-8 (1992); Gerald F. Hess, *Listening to Our Students: Obstructing and Enhancing Learning in Law School*, 31 U.S.F. L. REV. 941, 944 (1997).

<sup>84</sup> See MUNRO, *supra* note 12, at 107-09; SMITH & RAGAN, *supra* note 68, at 97; STUCKEY ET AL., *supra* note 12, at 243; *infra* note 87 and accompanying text (describing reliable assessment measures).

<sup>85</sup> See GERALD F. HESS & STEVEN FRIEDLAND, *TECHNIQUES FOR TEACHING LAW* 289 (1999); PATRICIA L. SMITH & TILLMAN J. RAGAN, *INSTRUCTIONAL DESIGN* 95 (2d ed. 1999); STUCKEY ET AL., *supra* note 12, at 241 (stating a valid assessment tool is one that “evaluates what was taught”); Munro, *supra* note 69, at 237 (“Validity means it must effect or accomplish that for which it was designed or intended.”); Greg Sergienko, *New Modes of Assessment*, 38 SAN DIEGO L. REV. 463, 465-55 (2001) (“Validity is the ability of the test to correspond to the items the test is meant to address.”). An essential facet of validity is congruence: “the goals of the test must agree with the goals of the instruction.” STUCKEY ET AL., *supra* note 12, at 241; see SMITH & RAGAN, *supra*, at 85.

<sup>86</sup> MUNRO, *supra* note 12, at 109.

<sup>87</sup> STUCKEY ET AL., *supra* note 12, at 243; see SMITH & RAGAN, *supra* note 85, at 97. Moreover, to be reliable, an assessment measure must yield consistent results. See MUNRO, *supra* note 12, at 107.

<sup>88</sup> See *infra* note 90 and accompanying text (discussing norm-referenced assessments).

<sup>89</sup> See *infra* note 91 and accompanying text (describing criteria-referenced assessments).

<sup>90</sup> See STUCKEY ET AL., *supra* note 12, at 243. Frequently, professors use normative assessment measures to adhere to grading curves. See *id.* The curve limits the number of students that can receive a particular grade. See Leslie M. Rose, *Norm-Referenced Grading in the Age of Carnegie: Why Criteria-Referenced Grading is More Consistent with Current Trends in Legal Education and How Legal Writing Can Lead the Way*, 17 LEGAL WRITING:

they have accomplished the educational objectives of the class.<sup>91</sup> Accordingly, the traditional single timed, end-of-the-course exam without any feedback that is graded on a curve falls short on all these criteria and is not well suited for course-based assessment.<sup>92</sup>

Assessment measures used to assess student learning at the course level can be direct or indirect.<sup>93</sup> A direct assessment measure is one in which students exhibit what they have learned.<sup>94</sup> Direct assessment measures include, among other things, exams,<sup>95</sup> clinical performances,<sup>96</sup> or capstone performances.<sup>97</sup> In contrast, an indirect assessment measure consists of the opinion of either the students themselves<sup>98</sup> or that of another observer.<sup>99</sup> Accordingly, an assessment measure may supply quantitative or qualitative information.<sup>100</sup>

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J. LEGAL WRITING INST. 124, 124 (2011). Norm-referenced grading pursuant to a curve has been criticized because at its root is the assumption that there is nothing that teachers can do to advance a student's abilities. *Id.* In addition, norm-referenced grading "increases student stress, interferes with deep learning, and does not adequately inform students whether they have reached a level of competence." *Id.*; see also Leah M. Christensen, *Enhancing Law School Success: A Study of Goal Orientations, Academic Achievement and the Declining Self-Efficacy of Our Law Students*, 33 L. & PSYCHOL. REV. 57, 81 (2009); Peggy Cooper Davis, *Slay the Three-Headed Demon!*, 43 HARV. CIV. RIGHTS-CIV. LIBERTIES L. REV. 619, 622 (2008); Zimmerman, *supra* note 50, at 897; see generally Rose, *supra* (providing a discussion of norm-referenced grading).

<sup>91</sup> See STUCKEY ET AL., *supra* note 12, at 243. In contrast to norm-referenced assessments, "[c]riteria-referenced assessments rely on detailed, explicit criteria that identify the abilities students should be demonstrating . . . and the bases on which the instructor will distinguish among excellent, good, competent, or incompetent performances." *Id.* at 244; see also Sophie Sparrow, *Describing the Ball: Improve Teaching by Using Rubrics—Explicit Grading Criteria*, 2004 MICH. ST. L. REV. 1, 6-15. Criteria-referenced grading increases the reliability of assigned grades. See STUCKEY ET AL., *supra* note 12, at 24; N.R. Madhava Menon, *Designing a Simulation-Based Clinical Course: Trial Advocacy in A HANDBOOK ON CLINICAL LEGAL EDUCATION* 181 (N.R. Madhava Menon ed., 1998). See Rose, *supra* note 90, at 127-28 for a discussion of criteria-referenced grading.

<sup>92</sup> See MUNRO, *supra* note 12, at 143; STUCKEY ET AL., *supra* note 12, at 238; Munro, *supra* note 69, at 237. Relying on one test at the end of the course to assess a student forecloses the ability for a test to provide any meaningful feedback. See Christopher T. Matthews, *Essay, Sketches for a New Law School*, 40 HASTINGS L.J. 1095, 1104 (1989).

<sup>93</sup> See ALLEN, *supra* note 52, at 6.

<sup>94</sup> See *id.*; Fisher, *supra* note 26, at 232.

<sup>95</sup> See ALLEN, *supra* note 52, at 7; SUSKIE, *supra* note 73, at 21.

<sup>96</sup> STUCKEY ET AL., *supra* note 12, at 267; SUSKIE, *supra* note 73, at 21.

<sup>97</sup> STUCKEY ET AL., *supra* note 12, at 267; SUSKIE, *supra* note 73, at 21.

<sup>98</sup> See ALLEN, *supra* note 52, at 103.

<sup>99</sup> See STUCKEY ET AL., *supra* note 12, at 267. These types of indirect assessments include follow-up surveys of graduates or employers or feedback from focus groups. See *id.*; see also ALLEN, *supra* note 52, at 118.

<sup>100</sup> See ALLEN, *supra* note 52, at 8. Quantitative information is conveyed via numerical

Direct assessment measures that professors employ to evaluate student performance can be formative, summative, or both.<sup>101</sup> Formative assessments measures are designed to help students learn and to impart timely and helpful feedback to the students throughout the learning process.<sup>102</sup> Accordingly, formative assessment measures do not need to be graded and are not calculated into the final course grade.<sup>103</sup> In a nutshell, formative assessments are “designed to provide feedback that enhances [a student’s] capacity to build on what [he or she] knows and to address areas of misunderstanding.”<sup>104</sup>

In contrast, the focus of summative assessment measures is not to help students learn. Rather, summative assessment measures focus on assigning a grade.<sup>105</sup> This has been the primary form of assessment in legal education, with little or no feedback given on the final end-of-the-course exam.<sup>106</sup> Summative assessment measures can also perform a formative function if professors hand them back with extensive feedback that explains how students can enhance their performance.<sup>107</sup>

Whether formative or summative, professors should use multiple and varied assessment measures during a course to assess student learning.<sup>108</sup> In addition, professors should provide students with timely feedback on the assessment measures.<sup>109</sup> Unlike one exam at the end of the

scores, while qualitative information is explained verbally. *Id.*

<sup>101</sup> See STUCKEY ET AL., *supra* note 12, at 255.

<sup>102</sup> See MUNRO, *supra* note 12, at 72-73. In addition to providing feedback to the students, formative assessments provide the professor with feedback, conveying “what works and what does not.” Duncan, *supra* note 25, at 623; see ALLEN, *supra* note 52, at 11.

<sup>103</sup> See STUCKEY ET AL., *supra* note 12, at 255.

<sup>104</sup> Judith Welch Wegner, *Reframing Legal Education’s “Wicked Problems”*, 61 RUTGERS L. REV. 867, 886 (2009).

<sup>105</sup> See MICHAEL HUNTER SCHWARTZ ET AL., *TEACHING LAW BY DESIGN: ENGAGING STUDENTS FROM THE SYLLABUS TO THE FINAL EXAM* 154 (2009).

<sup>106</sup> See MUNRO, *supra* note 12, at 73; *supra* notes 12-16 and accompanying text (discussing traditional assessment methods in law school).

<sup>107</sup> See SCHWARTZ ET AL., *supra* note 105, at 154-58; STUCKEY ET AL., *supra* note 12, at 260-61.

<sup>108</sup> MUNRO, *supra* note 12, at 74 (“Effective adult student evaluation schemes have three characteristics: multiple, varied, and fair.”); see DAVIS, *supra* note 83, at 239-47, 252-54; JACOBS & CHASE, *supra* note 83, at 1-3; Duncan, *supra* note 25, at 626 (“Law professors need to assess student attainment of the learning outcomes through multiple measures.”); Steven Friedland, *A Critical Inquiry into the Traditional Uses of Law School Evaluation*, 23 PACE L. REV. 147, 188 (2002); Hess, *supra* note 83, at 944; Nickles, *supra* note 12, at 461-62. These assessment measures can include document drafting exercises, short essay assignments, practice exam questions, group discussions, and multiple-choice questions.

<sup>109</sup> Professors should also use a rubric. A rubric sets forth in writing the grading criteria that the professor will use to assess a student’s performance. See RUBRICS: A HANDBOOK FOR CONSTRUCTION AND USE ix (Germaine L. Taggart et al. eds., 1998). The rubric



course that “prevents the test from providing any educational feedback,”<sup>110</sup> numerous assessments coupled with timely feedback fosters educational development.<sup>111</sup> Students and teachers can monitor progress throughout the course and adjust what they are doing accordingly to improve performance.<sup>112</sup>

In addition to providing numerous opportunities for feedback, multiple summative assessment measures, rather than a single exam at the end of the course, render the final grade more accurate because they allow the professor to adequately assess a student’s aptitude.<sup>113</sup> They also help students prepare for the final exam<sup>114</sup> and minimize the stress associated with one final exam that represents the entire grade in the course.<sup>115</sup> Finally, multiple assessment opportunities boost enthusiasm and encourage student efforts.<sup>116</sup>

These multiple assessment measures, whether conducted in class or outside of class, can be instructor-based, student-based, or peer-based.<sup>117</sup> The traditional form of assessment is instructor-based assessment, where the professor reviews and provides the student with a grade, feedback, or both.<sup>118</sup> Somewhat surprisingly, students prefer instructor-based assessment

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describes not only what knowledge and skills the students should learn but also the criteria upon which the professor relies in determining whether the student has demonstrated success. *See* Sparrow, *supra* note 91, at 8. There are numerous benefits to using rubrics. *Id.* at 16-27. For example, rubrics (1) focus student learning and what the law professor teaches; (2) expose a class’s intricacies; (3) supply constructive feedback to students; (3) assist students in becoming conscious of their learning; (4) convey high expectations; and (5) are intellectually engaging. *Id.*

<sup>110</sup> Matthews, *supra* note 92, at 1104.

<sup>111</sup> *See* MUNRO, *supra* note 12, at 151; STUCKEY ET AL., *supra* note 12, at 256 (noting numerous formative assessments along with timely feedback “ought to be the primary form of assessment in legal education”).

<sup>112</sup> *See* JACOBS & CHASE, *supra* note 83, at 2-7; Hess, *supra* note 83, at 944. Multiple assessment measures with timely feedback throughout the semester convey to the students what the professor expects and provides the students with a chance to practice before the final exam. *See* JACOBS & CHASE, *supra* note 83, at 5-8.

<sup>113</sup> *See* SCHWARTZ ET AL., *supra* note 105, at 155; Duncan, *supra* note 25, at 624; Hess, *supra* note 83, at 944; *see also* DAVIS, *supra* note 83, at 241 (asserting using a variety of assessment measures helps student perform to the best of their ability).

<sup>114</sup> *See* JACOBS & CHASE, *supra* note 83, at 4-7 (noting student performance on final exams improves with frequent assessments); Hess, *supra* note 83, at 944.

<sup>115</sup> STUCKEY ET AL., *supra* note 12, at 260; Friedland, *supra* note 108, at 188; Henderson, *supra* note 15, at 412.

<sup>116</sup> *See* Friedland, *supra* note 108, at 188 (noting multiple assessment measures “increase motivation, reduce test anxiety, increase facility with course material, and stimulate student efforts”); Henderson, *supra* note 15, at 412.

<sup>117</sup> *See infra* notes 118-129 and accompanying text (discussing different types of assessment measures).

<sup>118</sup> *See* Sergienko, *supra* note 85, at 475.

over assessment by their peers.<sup>119</sup> These instructor-based assessment measures can be either formative or summative.<sup>120</sup>

Student self-assessment is another means to provide students with assessment opportunities and to help students build essential self-learning skills.<sup>121</sup> In contrast to instructor-based assessment, student-based assessment is formative and the student evaluates their own work and progress.<sup>122</sup> These self-assessment skills are essential, as “[a]n indispensable trait of the truly competent lawyer, at whatever stage of career development, is that of knowing the extent and limits of his competence: what he can do and what requires the assistance of others.”<sup>123</sup> Professors can create effective self-assessment measures by providing students with explicit criteria to use to evaluate their own performance and by presenting the students with a means to compare their assessment of their work with that of their professors.<sup>124</sup> Despite the benefits, some of the drawbacks of self-assessment measures are that they can be unreliable and biased.<sup>125</sup>

Finally, peer-based assessment is generally formative and entails students reviewing and providing feedback on their classmates’ work.<sup>126</sup> There are several benefits to incorporating peer-based assessment versus self-assessment or instructor-based assessment. First, peer-assessment diminishes the bias of self-assessment.<sup>127</sup> Second, peer-assessment allows for a more impartial review than self-assessment because “the peer assessor does not know what the person being assessed was trying to say or do.”<sup>128</sup>

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<sup>119</sup> See *id.* at 483-84.

<sup>120</sup> See *supra* notes 102-107 and accompanying text (defining formative and summative assessment measures).

<sup>121</sup> See STUCKEY ET AL., *supra* note 12, at 254; see also MUNRO, *supra* note 12, at 124 (“Throughout an attorney’s professional life after law school, her success in practice will depend on the ability to self-assess professional performance, behavior, and attitudes.”); see generally Michael Hunter Schwartz, *Teaching Law Students to be Self-Regulated Learners*, 2003 MICH. ST. L. REV. 447 (2003) (discussing the value of student reflection).

<sup>122</sup> See Sergienko, *supra* note 85, at 479.

<sup>123</sup> Roger C. Cramton, *Lawyer Competence and the Law Schools*, 4 U. ARK. LITTLE ROCK L. J. 1, 8 (1981).

<sup>124</sup> See MUNRO, *supra* note 12, at 124; Lasso, *Students Learning*, *supra* note 24, at 96-97.

<sup>125</sup> See Sergienko, *supra* note 85, at 480-82.

<sup>126</sup> See *id.* at 482-83; see generally *id.* (discussing peer assessment).

<sup>127</sup> See JACOBS & CHASE, *supra* note 83, at 212 (recognizing that peer assessments, rather than self-assessments, tend to more closely correlate to instructor assessments); Sergienko, *supra* note 85, at 482. Peer assessments, however, can be biased if students decide to be forgiving in the hopes that their peers will be lenient with them in the future. JACOBS & CHASE, *supra* note 83, at 212; Sergienko, *supra* note 85, at 482-83. On the other hand, students may assess their peers ruthlessly to make themselves feel better about their ability or to achieve an advantage over their peers. Sergienko, *supra* note 85, at 483.

<sup>128</sup> Sergienko, *supra* note 85, at 483.

Identifying issues in a peer's work may also enable the student to better identify the same deficiencies in his or her own work.<sup>129</sup>

#### IV. WHY LEGAL EDUCATORS SHOULD EMPLOY TECHNOLOGY TO ASSESS STUDENT LEARNING AT THE COURSE LEVEL

Law professors can effectively and efficiently use technology—defined as “anything that was invented after you were born”<sup>130</sup>—to build multiple instructor, peer, and self-assessment opportunities into their courses, consistent with the proposed revisions to the Accreditation Standards and established learning theory. The explosion of technology since the millennium has been staggering: the array of technological tools now available to legal educators is in some senses overwhelming. Currently, technological tools that legal educators can draw on to assess student learning include wikis, email, podcasts, screencasting, text annotation systems, digital video annotation software, online discussion boards, blogs, and computer assisted instruction, to name only a few.<sup>131</sup> If technological advances continue at the current rate, the array of technological tools available to the legal educator will increase exponentially over the next ten years. Recognizing the promise of technology and that students matriculating today have grown up digital, legal educators can effectively use many of these technological tools to assess student learning.

A caveat: While there are many reasons to use technology as a means to assess student learning, professors should not integrate technology into the curriculum for its own sake.<sup>132</sup> In fact, student learning may be

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<sup>129</sup> *See id.* There is an additional benefit for professors. Compared to instructor-based assessment, peer-assessment measures—and self-assessment measures, for that matter—involve a minimal amount of work on the part of the professor. *See id.* In essence, the professor need only delineate the standards that the students should use in assessing their peer's work or their own work. *See id.*

<sup>130</sup> EDUCATION AND TECHNOLOGY: CRITICAL PERSPECTIVES, POSSIBLE FUTURES 194 (David W. Witt & Lucien T. Winegar eds., 2007) (quoting Alan Kay).

<sup>131</sup> *See* discussion *infra* Part V (discussing technologies that professors can use to assess student learning).

<sup>132</sup> *See* PALFREY & GASSER, *supra* note 5, at 247 (“The technology should only be applied in support of our pedagogy, not for its own sake.”); Francis J. Carney, *A Few Words of Caution About Computer Presentations*, 15 UTAH BAR J. 14, 14 (2002); Molly Warner Lien, *Technocentrism and the Soul of the Common Law Lawyer*, 48 AM. U. L. REV. 85, 89-90 (1998); Kathleen Elliott Vinson, *What's on Your Playlist? The Power of Podcasts as a Pedagogical Tool*, 2009 U. ILL. J.L. TECH. & POL'Y 405, 412; Jill Schachner Chanen, *Profs Kibosh Students' Laptops: More Law Schools are Banning Them as a Distraction—Or Worse*, A.B.A. J., Nov. 2007, at 16, available at [http://www.abajournal.com/magazine/article/profs\\_kibosh\\_students\\_laptops](http://www.abajournal.com/magazine/article/profs_kibosh_students_laptops). Legal educators should consider trends in legal practice and the technical prowess of law students

hindered by the inappropriate use or misuse of technology in the classroom.<sup>133</sup> Legal educators should employ technology in a pedagogically appropriate manner that is consistent with learning theory.<sup>134</sup>

There are three reasons why legal educators should use technology as one means to incorporate assessment opportunities into the curriculum beyond one end-of-the-semester exam. First, students matriculating at law schools today are digital natives who are extremely comfortable with technology and expect to have technology integrated into the curriculum.<sup>135</sup> Second, incorporating technology as a means to assess student learning will help to prepare future lawyers for the realities of law practice today.<sup>136</sup> Finally, technology provides an effective and efficient way to provide multiple assessment opportunities to a large number of students.<sup>137</sup>

#### A. Law Students Today are Digital Natives

Law schools should use technology to assess student learning because the majority of students entering law school today are members of the Millennial Generation<sup>138</sup> and thus digital natives.<sup>139</sup> In contrast to

in determining whether to incorporate technology into the curriculum. *See* Kristin B. Gerdy et al., *Expanding Our Classroom Walls: Enhancing Teaching and Learning Through Technology*, 11 LEGAL WRITING: J. LEGAL WRITING INST. 263, 293 (2005).

<sup>133</sup> *See* Craig T. Smith, *Technology and Legal Education: Negotiating the Shoals of Technocentrism, Technophobia, and Indifference*, 1 J. ASS'N LEGAL WRITING DIRECTORS 247, 247, 249 (2002); *see also* Suzanne Ehrenberg, *Legal Writing Unplugged: Evaluating the Role of Computer Technology in Legal Writing Pedagogy*, 4 LEGAL WRITING: J. LEGAL WRITING INST. 1, 3 (1998); Lien, *supra* note 132, at 85-89; 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, 17-21 (2007); Vinson, *supra* note 132, at 412; Ray Fisman, *The \$100 Distraction Device: Why Giving Poor Kids Laptops Won't Improve Their Scholastic Performance*, SLATE (June 5, 2008), <http://www.slate.com/id/2192798/>.

<sup>134</sup> *See* PALFREY & GASSER, *supra* note 5, at 246 (“We should figure out, instead, how the use of technologies can support our pedagogical goals”); Lasso, *Paper Chase*, *supra* note 8, at 23.

<sup>135</sup> *See* Marie Stefani Newman, *Not the Evil TWEN: How Online Course Management Software Supports Non-Linear Learning in Law Schools*, 5 J. HIGH TECH. L. 183, 183-85 (2005); *supra* notes 4-8 and accompanying text (describing characteristics of digital natives); *infra* Part IV(A) and accompanying text (discussing attributes of law students today).

<sup>136</sup> *See* discussion *infra* Part IV(B) (discussing how the use of technology will prepare students for modern law practice).

<sup>137</sup> *See* discussion *infra* Part IV(C) (noting that technology allows professors to efficiently incorporate more assessment measures).

<sup>138</sup> While there is some disagreement, the Millennial Generation—also referred to as Gen Y or the Net Generation—includes individuals born between 1982 and 1995. *See* Thomas C. Reeves & Eunjung Oh, *Generational Differences*, in HANDBOOK OF RESEARCH

members of previous generations, digital natives have had access to the Internet for nearly their entire life.<sup>140</sup> They are younger than the microcomputer<sup>141</sup> and have grown up surrounded by digital and cyber technologies.<sup>142</sup> This exposure to technology from a very early age means that students matriculating at law schools today have had learning

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COMMUNICATIONS AND TECHNOLOGY 295-300 (3d ed. 2006), *available at* [http://faculty.ksu.edu.sa/Alhassan/Hand%20book%20on%20research%20in%20educationa%20communication/ER5849x\\_C025.fm.pdf](http://faculty.ksu.edu.sa/Alhassan/Hand%20book%20on%20research%20in%20educationa%20communication/ER5849x_C025.fm.pdf). *But see* DAVID I. C. THOMSON, *LAW SCHOOL 2.0: LEGAL EDUCATION FOR A DIGITAL AGE* 26 (2009) (maintaining Millennials refers to individuals born after 1982); Neil Howe & Reena Nadler, *Yes We Can: The Emergence of Millennials as a Political Generation*, NEW AM. FOUND., Feb. 2009, at 6, [http://www.womenscolleges.org/files/pdfs/Yes\\_We\\_Can\\_Feb09.pdf](http://www.womenscolleges.org/files/pdfs/Yes_We_Can_Feb09.pdf) (defining Millennial Generation as being comprised of those born between 1982 and 2004); David Madland & Ruy Teixeira, *New Progressive America: The Millennial Generation*, CTR. FOR AM. PROGRESS, May 13, 2009, at 1, [http://www.americanprogress.org/issues/2009/05/pdf/millennial\\_generation.pdf](http://www.americanprogress.org/issues/2009/05/pdf/millennial_generation.pdf) (asserting Millennial generation includes those individuals born between 1978 and 2000).

<sup>139</sup> See *supra* notes 4-8 and accompanying text (defining digital natives).

<sup>140</sup> See 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, 195 (2011).

<sup>141</sup> See THOMSON, *supra* note 138, at 26 (noting that IBM first began mass production of the PC in 1982); Jason L. Frand, *The Information Age Mindset: Changes in Students and Implications for Higher Education*, EDUCAUSE REV., Sept.-Oct. 2000, at 15, *available at* <http://net.educause.edu/ir/library/pdf/erm0051.pdf>.

<sup>142</sup> See Prensky, *supra* note 4, at 1. As early as 2002, twenty percent of college students reported that they first started using computers between the ages of five and eight. Steve Jones, *The Internet Goes to College: How Students are Living in the Future with Today's Technology*, PEW INTERNET & AM. LIFE PROJECT, 2 (Sept. 15, 2002), [http://www.pewinternet.org/~media/Files/Reports/2002/PIP\\_College\\_Report.pdf](http://www.pewinternet.org/~media/Files/Reports/2002/PIP_College_Report.pdf). Moreover, pursuant to one study, ninety-three percent of children in primary or secondary school use a computer, whether at home or at school. Jennifer C. Day et al., U.S. CENSUS BUREAU, CURRENT POPULATION REPORTS: COMPUTER AND INTERNET USE IN THE UNITED STATES 7 (2005). Another study surveyed 7,705 college students in the United States and revealed that just short of one hundred percent of the students possess a computer; almost 95% have a mobile phone; 75% instant message (of which 15% are always logged on); almost 34% use the Internet to access the news; close to 50% browse blogs while 28% maintain their own; and almost 70% have a Facebook account. REYNOL JUNCO & JEANNA MASTRODICASA, CONNECTING TO THE NET.GENERATION: WHAT HIGHER EDUCATION PROFESSIONALS NEED TO KNOW ABOUT TODAY'S STUDENTS 67, 70-80 (2007).

As such, the average law student—by the time they have reached twenty-one years of age—has spent more than 10,000 hours playing video games, sent circa 200,000 emails, and spent 10,000 hours on a cell phone. Cassandra Barnes, Raymond C. Marateo, & S. Pixy Ferris, *Teaching and Learning with the Net Generation*, INNOVATE: J. ONLINE EDUC. (Apr./May 2007), [http://www.innovateonline.info/pdf/vol3\\_issue4/Teaching\\_and\\_Learning\\_with\\_the\\_Net\\_Generation.pdf](http://www.innovateonline.info/pdf/vol3_issue4/Teaching_and_Learning_with_the_Net_Generation.pdf). This is in striking contrast to the mere 5,000 hours spent reading. *Id.*

experiences quite different from their law professors.<sup>143</sup>

As a result of this saturation with technology, digital natives are radically different from the law students of the past.<sup>144</sup> These students do not think and process material in the same way as members of previous generations.<sup>145</sup> Some of the distinct characteristics of digital natives<sup>146</sup> demonstrate the pivotal role that technology can play in providing effective legal education that incorporates multiple assessment opportunities.

Having grown up digital, law students matriculating today have a difficult time absorbing information passively.<sup>147</sup> Digital natives also tend to be visual and kinesthetic learners who learn better through interactive

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<sup>143</sup> See M.H. Sam Jacobson, *A Primer on Learning Styles: Reaching Every Student*, 25 SEATTLE U. L. REV. 139, 151 (2001); Murray, *supra* note 140, at 197. While digital natives have grown up surrounded by technology, many of these students are not digitally literate and do not employ technology “well, appropriately, or optimally.” THOMSON, *supra* note 138, at 28.

<sup>144</sup> PALFREY & GASSER, *supra* note 5, at 4; see NEIL HOWE & WILLIAM STRAUSS, *MILLENNIALS GO TO COLLEGE* 59-60 (2d ed. 2007) (describing Millennials as “confident, conventional, sheltered, team-oriented, achieving, special, and pressured”); Murray, *supra* note 140, at 197.

<sup>145</sup> Prensky, *supra* note 4, at 1 (emphasis omitted); see Jay David Bolter, *Hypertext and the Question of Visual Literacy*, in HANDBOOK OF LITERACY AND TECHNOLOGY: TRANSFORMATIONS IN A POST-TYPOGRAPHICAL WORLD 1 (Reinking et al. eds., 1998); Daniel L. Barnett, “*Form Ever Follows Function*”: *Using Technology to Improve Feedback on Student Writing in Law School*, 42 VAL. U. L. REV. 755, 776-77 (2008); Joan MacLeod Heminway, *Caught in (or on) the Web: A Review of Course Management Systems for Legal Education*, 16 ALB. L.J. SCI. & TECH. 265, 283-89 (2006); Lasso, *Paper Chase*, *supra* note 8, at 1; Craig T. Smith, *Synergy and Synthesis: Teaming “Socratic Method” with Computers and Data Projectors to Teach Synthesis to Beginning Law Students*, 7 LEGAL WRITING: J. LEGAL WRITING INST. 113, 114 (2001). These differences are more profound than educators appreciate. Prensky, *supra* note 4, at 1 (quoting Dr. Bruce D. Berry of Baylor College of Medicine that “[d]ifferent kinds of experiences lead to different brain structures”). In fact, it has been posited that the digital natives’ brains “are likely physically different as a result of the digital input they received growing up.” Marc Prensky, *Digital Natives, Digital Immigrants Part 2: Do They Really Think Differently?*, ON THE HORIZON, Nov./Dec. 2001, at 1, 6, available at <http://www.marcprensky.com/writing>; see PALFREY & GASSER, *supra* note 5, at 239.

<sup>146</sup> See *infra* notes 147-154 and accompanying text (setting forth characteristics of digital natives). In school, they are “[f]ocused on grades and performance,” “[t]alented in digital-mobile technologies,” “[c]apable of multitasking and interested in interactive learning,” and “[c]onventionally minded.” Murray, *supra* note 140, at 197; see HOWE & STRAUSS, *supra* note 144, at 31; see also Joan Catherine Bohl, *Generations X and Y in Law School: Practical Strategies for Teaching the “MTV/Google” Generation*, 54 LOY. L. REV. 775, 781-82 (2008).

<sup>147</sup> See Bohl, *supra* note 146, at 785-86; Lasso, *Paper Chase*, *supra* note 8, at 23; Tracy L. McGaugh, *Generation X in Law School: The Dying of the Light or the Dawn of a New Day?*, 9 LEGAL WRITING: J. LEGAL WRITING INST. 119, 133 (2003).

mediums.<sup>148</sup> Feedback is one of the crucial components of an interactive curriculum that actively engages students.<sup>149</sup> Moreover, digital natives expect immediate evaluations, clear responses, and easy access to materials.<sup>150</sup> Accordingly, today's students would respond well to technological assessment tools that actively engage students and provide instant results because "their technology-laced experience has conditioned them to receive information in small, discrete portions, rather than engaging in a lengthy process of learning with results deferred."<sup>151</sup>

Another defining characteristic of digital natives is that they tend to gravitate towards working collaboratively.<sup>152</sup> Therefore, law students today would respond well to technological assessment measures that allow students to work with their peers on a project.<sup>153</sup> They also have a fascination for new technologies and, not surprisingly, they prefer using a keyboard to working with pen and paper and are more comfortable reading directly from a computer screen as compared to a printout of a document.<sup>154</sup> As a result of these characteristics of digital natives, legal educators should increase their use of technology in the curriculum to provide more assessment opportunities consistent with learning theory.

Growing up digital and using technology in virtually all facets of their life, twenty-first century law students also expect their law professors to use technology.<sup>155</sup> The choice to use technology to assess students not

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<sup>148</sup> See Bohl, *supra* note 146, at 785; Steven I. Friedland, *How We Teach: A Survey of Teaching Techniques in American Law Schools*, 20 SEATTLE U. L. REV. 1, 23 (1996); 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, 288 (2006); Lasso, *Paper Chase*, *supra* note 8, at 23 (recognizing digital natives "learn better when they receive information through a medium that is more dynamic, interactive, and creative than printed text"); Richard A. Matasar & Rosemary Shiels, *Electronic Law Students: Repercussions on Legal Education*, 29 VAL. U. L. REV. 909, 917 (1995).

<sup>149</sup> See Bohl, *supra* note 146, at 785; Ingraham & Boyle, *supra* note 148, at 287; *supra* notes 108-112 and accompanying text (discussing feedback).

<sup>150</sup> See HARRIS, *supra* note 5, at viii; Bohl, *supra* note 146, at 780 (noting digital natives expect instant gratification); Heminway, *supra* note 145, at 288; Prensky, *supra* note 4, at 2 (positing that students today "thrive on instant gratification").

<sup>151</sup> Bohl, *supra* note 146, at 785; see Linda S. Anderson, *Incorporating Adult Learning Theory into Law School Classrooms: Small Steps Leading to Large Results*, 5 APPALACHIAN J.L. 127, 136-42 (2006).

<sup>152</sup> See HOWE & STRAUSS, *supra* note 144, at 66-69; NEIL HOWE & WILLIAM STRAUSS, *MILLENNIAL RISING: THE NEXT GREAT GENERATION* 180-82 (2000); Maria Perez Crist, *Technology in the LRW Curriculum—High Tech, Low Tech, or No Tech*, 5 LEGAL WRITING: J. LEGAL WRITING INST. 93, 99 (1999); Murray, *supra* note 140, at 197.

<sup>153</sup> See Crist, *supra* note 152, at 99 (noting technology generates additional chances for collaborative learning).

<sup>154</sup> See Frand, *supra* note 141, at 15.

<sup>155</sup> See Diana R. Donahoe, *An Autobiography of a Digital Idea: From Waging War*

only meets this expectation but also sends a message to the students that their professors are invested in their success.<sup>156</sup> In turn, students are more motivated when they feel that their professors are invested in their learning.<sup>157</sup> Integrating technology into the curriculum serves as one means to raise student confidence while simultaneously reducing the frustration that the demands of law school can breed.<sup>158</sup>

### B. Prepares Students for Modern Law Practice

Utilizing technology to assess student learning will also provide students with solid technical tools that will prepare them for the realities of law practice today.<sup>159</sup> Dating back to 1992, the three major reports on the status of legal education all maintain that law schools need to do a better job preparing students for the practice of law.<sup>160</sup> Law schools have an obligation to produce technologically savvy lawyers because technology is “an ineluctable part of the practice of law”<sup>161</sup> and essential to any law practice.<sup>162</sup>

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*Against Laptops to Engaging Students with Laptops*, 59 J. LEGAL EDUC. 485, 486 (2010); Stephen M. Johnson, *www.lawschool.edu: Legal Education in the Digital Age*, 2000 WIS. L. REV. 85, 101; Sergienko, *supra* note 85, at 192; Smith, *supra* note 133, at 253 (“The ‘Internet Generation’ expects us to employ technology.”).

<sup>156</sup> See Lasso, *Paper Chase*, *supra* note 8, at 58-60.

<sup>157</sup> See *id.*

<sup>158</sup> See *id.*

<sup>159</sup> See Johnson, *supra* note 155, at 101; Richard L. Marcus, *The Electronic Lawyer*, 58 DEPAUL L. REV. 263, 264 (2009); Murray, *supra* note 140, at 193.

<sup>160</sup> The first report, the *Report of the MacCrate Task Force on Law Schools and the Profession: Narrowing the Gap*, was published in 1992 and recommended that law schools place more focus on enhancing students' practice skills so that law students would be better prepared to practice upon graduating. SECTION OF LEGAL EDUCATION AND ADMISSION TO THE BAR, AMERICAN BAR ASSOCIATION, LEGAL EDUCATION AND PROFESSIONAL DEVELOPMENT-AN EDUCATIONAL CONTINUUM, REPORT OF THE TASK FORCE ON LAW SCHOOLS AND THE PROFESSION: NARROWING THE GAP (July 1992). Subsequently, the Carnegie Report, published in 2007, reaffirmed the need to integrate educational experiences that prepare students for the realities of practice. SULLIVAN ET AL., *supra* note 12, at 88. Finally, *Best Practices*, also published in 2007, echoed this, acknowledging that “one of the basic obligations of a law school is to prepare its students for the practice of law.” STUCKEY ET AL., *supra* note 12, at 16.

<sup>161</sup> THOMSON, *supra* note 138, at 47.

<sup>162</sup> See Tracey Baetzel & Carl W. Herstein, *Virtual Memory: Looking Back at the Changing Relationship Among Lawyers, Law Firms and Technology*, MICH. B.J., May 1998, at 422, 422; see also Fred Galves, *Where the Not-So-Wild Things Are: Computers in the Courtroom, the Federal Rules of Evidence, and the Need for Institutional Reform and More Judicial Acceptance*, 13 HARV. J.L. & TECH. 161, 172 (2000) (noting clients are increasingly insisting that lawyers use technology); Gerdy, *supra* note 132, at 263 (“Law practice is becoming increasingly technical.”); Johnson, *supra* note 155, at 14. At this juncture,



Unlike in the past, today nearly 100% of attorneys have a computer in their office,<sup>163</sup> and 94.7% of attorneys create some of their own documents using word processing programs.<sup>164</sup> The use of law practice management software<sup>165</sup> that provides a central repository for all of the information connected to a case is widespread.<sup>166</sup> This type of software assists with document management, allowing lawyers to efficiently streamline and search the staggering amount of paperwork associated with the practice of law.<sup>167</sup> It also includes calendar, email, report generating, and electronic billing capabilities.<sup>168</sup>

In addition, lawyers are increasingly called upon to use technology for other aspects of law practice. For example, lawyers now file electronically and conference and collaborate electronically.<sup>169</sup> More and

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[i]t is an understatement to say that technology has asserted its dominion within the practice of law. Technology has infiltrated the lawyer's practice in nearly every area—communication with clients and colleagues, legal research, discovery and handling of electronic evidence, and even courtroom presentation and trial practice. Attorneys who ignore technology's dominion do so at their peril.

Nelson P. Miller & Derek S. Witte, *Helping Law Firm Luddites Cross the Digital Divide—Arguments for Mastering Law Practice Technology*, 12 SMU SCI. & TECH. L. REV. 113, 114 (2009); see also Steph Kimbro, *Receiving a Digital Legal Education*, LAWYERIST.COM (Oct. 21, 2010), <http://lawyerist.com/receiving-a-digital-legal-education/> (“Realistically, any legal professional starting out today would be negligent to enter the practice without understanding how technology will play a role in his or her interactions with clients, other professionals, and the justice system.”).

<sup>163</sup> 2008 AMERICAN BAR ASSOCIATION LEGAL TECHNOLOGY RESOURCE CENTER SURVEY REPORT 23 (2008); THOMSON, *supra* note 138, at 45.

<sup>164</sup> THOMSON, *supra* note 138, at 45. Moreover, nearly 95% of lawyers also use computers to facilitate their practice outside of the office. *Id.*

<sup>165</sup> Law practice management software is also referred to as case management software.

<sup>166</sup> In general, law practice management systems include the following: calendar, database of people, email, document creation, standard and customized reports, checklists, daily reports, central storage, integration with research, and remote access capabilities. See Daniel J. Siegel, *Take A (Case) Load Off with the Right Software: Is Your Desk Hidden Under A Mountain of Paper? Case Management Software Can Help You Get Your Records and Your Schedule Under Control—and Keep Them That Way. Choose Carefully*, TRIAL, May 2006, at 56; 1 SUCCESSFUL PARTNERING BETWEEN INSIDE AND OUTSIDE COUNSEL § 11:22.

<sup>167</sup> See Siegel, *supra* note 166, at 56.

<sup>168</sup> *Id.*

<sup>169</sup> See Crist, *supra* note 152, at 96-97; Gerdy, *supra* note 132, at 263. For example, increasingly attorneys use wikis to produce documents collaboratively. Broussard, *supra* note 7, at 909. It has been posited that “[t]hese dynamically and collaboratively produced works are going to become a permanent fixture of our media landscape.” Beth Simone Noveck, *Wikipedia and the Future of Legal Education*, 57 J. LEGAL EDUC. 3, 7 (2007).

more, attorneys use document cameras,<sup>170</sup> computer presentation programs,<sup>171</sup> and computer-generated exhibits to present evidence digitally.<sup>172</sup> Moreover, many attorneys believe that electronic service of process will eventually become commonplace.<sup>173</sup> Finally, attorneys are blogging about legal issues and generating clients through blogs.<sup>174</sup>

Despite this vast increase in the use of technology in the practice of law, law schools have generally failed to recognize the impact of the Information Age and do not teach students about the technological tools that can be used to effectively deliver legal services today. Legal educators need to integrate technology into the curriculum to better prepare law students to efficiently and effectively use technology in practice.<sup>175</sup> Employing technology to assess student learning is but one means to answer this call to prepare law students for practice.<sup>176</sup>

### C. Allows Professors to Incorporate Assessment Opportunities in a Less Onerous Manner

Many legal educators are hesitant to stray away from the “one exam at the end of the course” model and to incorporate multiple assessment opportunities into their course because of concerns about the time and effort

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<sup>170</sup> See Michael P. Kenny & William H. Jordan, *Trial Presentation Technology: A Practical Perspective*, 67 TENN. L. REV. 587, 596-97 (2000) (noting that in light of the ease of use, document cameras are one of the technologies that lawyers use most often at trial).

<sup>171</sup> See Gregory Morse, *Techno-Jury: Techniques in Verbal and Visual Persuasion*, 54 N.Y.L. SCH. L. REV. 241, 249-50 (2010); David G. Reis, *Computer Presentations by Lawyers in the Conference Room, Classroom, and Courts*, 78 PA. BAR. ASSOC. Q. 56, 56 (2007).

<sup>172</sup> See Galves, *supra* note 162, at 301. The expression “Computer-Generated Exhibits” (“CGEs”) encompasses various kinds of exhibits. See William F. Lee, *Using Computer-Generated Evidence at Trial*, in HOW TO TRY A COMMERCIAL CASE IN THE 1990S, at 159 (PLI Litig. & Admin. Practice Course Handbook Series No. H4-5214, 1995) available at WL 523 PLI/Lit 159 (explaining types of computer-generated exhibits). For example, the term includes computer projected word-processed documents or illustrations. *Id.* It also includes animated video clips depicting an accident or the 3D re-creation of a crime scene that the lawyer can rotate on the computer to allow the jury to experience the scene from different perspectives. *Id.*

<sup>173</sup> See Francis Ward, *Our Pleasure to Serve You: More Lawyers Look to Social Networking Sites to Notify Defendants*, A.B.A. J., Oct. 2011, at 14. As one judge noted, “Service is critical, and technology provides a cheaper and hopefully more effective way of finding respondent.” *Id.* (quoting Judge Kevin S. Burke, Hennepin County, Minnesota).

<sup>174</sup> See Adrian Dayton, *Blogging Levels the Playing Field*, NAT’L L.J., Oct. 5, 2011, <http://www.law.com/jsp/nlj/PubArticleNLJ.jsp?id=1202517940986> (describing examples of use of blogs by small firm lawyers to generate one million dollars in business and to win business that traditionally goes to large firms).

<sup>175</sup> See Sonsteng et al., *supra* note 2, at 356.

<sup>176</sup> See Matasar & Shiels, *supra* note 148, at 933.

that assessment entails. Creating multiple assessments can be time-consuming, particularly when one recognizes that legal educators generally do not receive any formal training in creating assessment measures.<sup>177</sup> Even if the law professor has expertise in constructing assessment measures, providing feedback can be incredibly time consuming because core classes tend to be large.<sup>178</sup> While legal educators may understand the benefits of committing their time to conducting more than one exam at the end of the semester, they may feel constrained to spend the time on writing, as most law schools focus on scholarly output when making tenure decisions.<sup>179</sup>

Recognizing the proposed revisions to the ABA's Accreditation Standards,<sup>180</sup> legal educators need to consider ways to integrate multiple assessment measures into the curriculum despite these time constraints. Technology provides one solution. Technology allows law professors to conduct meaningful assessments of large numbers of students more efficiently. As fleshed out in more detail below in Part V, using technology to assess digital natives allows for collaborative work resulting in fewer assignments to review, facilitates instantaneous feedback, and lends itself to self-assessment opportunities.

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<sup>177</sup> See Linda R. Crane, *Grading Law School Examinations: Making a Case for Objective Exams to Cure What Ails "Objectified" Exams*, 34 NEW ENG. L. REV. 785, 801 (2000) ("Law professors receive little, if any, training or guidance for teaching, drafting, and grading exams in other than the 'traditional' ways."); Friedland, *supra* note 108, at 178-79 ("The lack of training in the creation of valid and reliable examinations contributes to the overvaluation of examinations as a measuring device.").

<sup>178</sup> See Bethany Rubin Henderson, *Asking the Lost Question: What Is the Purpose of Law School?*, 53 J. LEGAL EDUC. 48, 64 (2003) ("First-year classes almost uniformly are taught in large sections."); Patricia Mell, *Taking Socrates' Pulse: Does the Socratic Method Have Continuing Vitality in 2002?*, MICH. B.J., May 2002, at 46, 46 ("First-year class sizes rang[e] from sixty students to more than 100 students."). Some first-year courses are smaller; in particular, legal writing classes likely have fewer than forty-four students. Aizen, *supra* note 19, at 794.

<sup>179</sup> See Richard L. Abel, *Evaluating Evaluations: How Should Law Schools Judge Teaching*, 40 J. LEGAL EDUC. 407, 415 (1990); Arthur Austin, *The Law Academy and the Public Intellectual*, 8 ROGER WILLIAMS U. L. REV. 243, 254 (2003) (explaining that by 1990, "the ascendancy of a publish or perish requirement was forcing a deluge of manuscripts on the student-run law reviews"); Lasso, *Students Learning*, *supra* note 24, at 95; Robert P. Schuwerk, *The Law Professor as Fiduciary: What Duties Do We Owe to Our Students*, 45 S. TEX. L. REV. 753, 763 (2004) ("Once they are hired, law professors are rewarded primarily for scholarship."); Steve Sheppard, *An Informal History of How Law Schools Evaluate Students, with a Predictable Emphasis on Law School Final Exams*, 65 UMKC L. REV. 657, 693 (1997) ("The exam as the sole method of grading has led to some obvious advantages, particularly in reducing faculty work-load.").

<sup>180</sup> See *supra* notes 64-72 and accompanying text (discussing proposed revisions).

## V. TECHNOLOGY: TOOLS TO ASSESS STUDENT LEARNING AND PROVIDE FEEDBACK

Legal educators have an array of technological tools that they can use to effectively and efficiently assess students and provide them with timely feedback. The suggestions in this article are not exhaustive; rather, this article discusses several examples of how to use a number of today's technologies—both inside the classroom and outside the classroom—in the hopes of initiating further exploration into effective means to use technology to assess student learning.

### A. Technology to Assess Student Learning in the Classroom

Law professors can effectively use technology to assess student learning in the classroom. While some may be concerned about taking the time during class, incorporating multiple assessment opportunities that are self, peer, or instructor-based is consistent with learning theory. Law professors can easily use technology—audience response systems, document cameras, commercial presentation programs, and interactive whiteboards—in the classroom.

#### 1. Audience Response Systems

Audience response systems<sup>181</sup> provide a means to assess student learning electronically in the classroom.<sup>182</sup> These systems allow audience members to submit answers to interactive questions during a presentation using a hand-held computer device commonly referred to as a “clicker.”<sup>183</sup> Providing for real-time audience response, audience response systems engage the audience, assess student learning, and assemble data.<sup>184</sup>

Specifically, prior to class,<sup>185</sup> the professor prepares multiple-choice

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<sup>181</sup> These systems are also referred to as student response systems or classroom response systems.

<sup>182</sup> There are various different types of audience response system software available. See Ashley Deal, *Classroom Response Systems*, TEACHING WITH TECH. WHITE PAPER, Nov. 30, 2007, at 12-13, [http://www.cmu.edu/teaching/resources/PublicationsArchives/StudiesWhitepapers/ClassroomResponse\\_Nov07.pdf](http://www.cmu.edu/teaching/resources/PublicationsArchives/StudiesWhitepapers/ClassroomResponse_Nov07.pdf) (listing various audience response systems on the market). TurningPoint integrates with Microsoft PowerPoint and is one of the most flexible systems available. *Id.* at 12; see TURNING TECHNOLOGIES, <http://www.turningtechnologies.com/> (last visited June 27, 2012).

<sup>183</sup> See Deal, *supra* note 182, at 2.

<sup>184</sup> See *id.* at 2, 4.

<sup>185</sup> Some audience response software also permits the professor to create questions during class.

questions that are displayed on presentation slides built with the audience response system software.<sup>186</sup> During class, the professor projects each question on a screen at the front of the room.<sup>187</sup> Each student then responds to the question by pressing the button on the clicker corresponding to what he or she believes is the correct answer.<sup>188</sup> A receiver that is attached to the presenter's computer records each student's response and the aggregate data is displayed on the screen for the students to review.<sup>189</sup> The responses are anonymous and are displayed as a chart, graph, or score.<sup>190</sup> The professor can also save the responses of each class session for future review and track each student's performance throughout the course.<sup>191</sup>

Audience response systems allow for assessment at the professor and student level. At the professor level, the professor receives immediate feedback from the students in the class.<sup>192</sup> During class, the professor can see how the entire class has answered the question to ascertain whether the students understand the key points.<sup>193</sup> Accordingly, the professor can immediately clear up any student misperceptions rather than waiting until after the final exam.<sup>194</sup> In addition, if the professor tracks each student, the professor can see how each student has answered a question and whether the student comprehends the material being covered. The prompt feedback that students receive also allows the students to self-assess whether they understand the legal concepts being covered.<sup>195</sup>

Legal educators can use audience response systems in various ways to assess student learning at the course level. First, professors can compose various sorts of questions for their students. For example, after covering a particular case, statute, rule, or regulation, professors can pose a question to illustrate the particular rule.<sup>196</sup> Similarly, the audience response systems can

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<sup>186</sup> Deal, *supra* note 182, at 2.

<sup>187</sup> *See id.*

<sup>188</sup> *See id.*

<sup>189</sup> *See id.*

<sup>190</sup> *See id.*

<sup>191</sup> *See id.*

<sup>192</sup> STUCKEY ET AL., *supra* note 12, at 259; Deal, *supra* note 182, at 4; Lasso, *Students Learning*, *supra* note 24, at 105.

<sup>193</sup> See Paul L. Caron & Rafael Gely, *Taking Back the Law School Classroom: Using Technology to Foster Active Student Learning*, 54 J. LEGAL EDUC. 551, 564-65 (2004) (recognizing that these types of assessments allow professors to ascertain "where there are knowledge gaps and misperceptions").

<sup>194</sup> See Caron & Gely, *supra* note 193, at 564; Deal, *supra* note 182, at 4.

<sup>195</sup> See STUCKEY ET AL., *supra* note 12, at 259; Caron & Gely, *supra* note 193, at 563; Lasso, *Students Learning*, *supra* note 24, at 105.

<sup>196</sup> For example, in a tax class, the professor can end a discussion of a particular tax code provision with a question about the application of the code provision to a hypothetical. Alternatively, in a legal methods class, the professor can pose questions about

be used to ask questions about a hypothetical that is being discussed in class. Alternatively, at the end of the discussion of a topic the professor can project some review questions that are exemplary of the types of multiple-choice questions that will be on the end-of-the-year exam. Professors can also place the burden on the students to compose the questions, breaking students into groups and asking the students to compile questions for their peers.

If the professor has assigned a writing exercise, the professor can also compose questions to highlight and address the common issues on the assignment. Finally, professors can provide students with a sample answer to an essay question and, with a rubric,<sup>197</sup> ask students to respond to questions about the sample answer.

## 2. Document Cameras

Replacing overhead projectors, document cameras<sup>198</sup>—frequently referred to as ELMO projectors<sup>199</sup>—are high-resolution webcams that are placed on arms that hold the webcam over the page and magnify and display whatever is placed on it.<sup>200</sup> The live picture taken by the camera is projected onto a screen.<sup>201</sup> In addition to allowing professors to project any document during class, document cameras also allow the professor to write directly on the document being displayed.<sup>202</sup>

Legal educators can use document cameras in class to provide peer and instructor-based assessment of student work. For example, a professor can assign a midterm or sample essay question. Rather than providing individual feedback on all of the papers, the professor can project a student sample or a sample the professor created to provide feedback on what a good answer would entail. Alternatively, the professor can have the students critique an answer using a rubric<sup>203</sup> in class and then project the sample of the suggested edits for class discussion.

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court systems, hierarchy of authority, or citation rules.

<sup>197</sup> See *supra* note 109 (discussing rubrics).

<sup>198</sup> They are also referred to as image presenters, visual presenters, digital visualizers, digital overheads, and docucams. *Document Camera*, WIKIPEDIA, [http://en.wikipedia.org/wiki/Document\\_camera](http://en.wikipedia.org/wiki/Document_camera) (last visited June 27, 2012).

<sup>199</sup> The term ELMO projector comes from the brand name ELMO Digital Visual Presenters. See ELMO, <http://www.elmoussa.com> (last visited June 27, 2012).

<sup>200</sup> See Frederic I. Lederer, *The Road to the Virtual Courtroom? A Consideration of Today's—and Tomorrow's—High-Technology Courtrooms*, 50 S.C. L. REV. 799, 813 (2000) (explaining document cameras change “documents, other physical images, and objects into television or computer images”).

<sup>201</sup> See Kenny & Jordan, *supra* note 170, at 587.

<sup>202</sup> See *Document Camera*, *supra* note 198.

<sup>203</sup> See *supra* note 109 (discussing rubrics).

Similarly, professors can use the document camera to assess a writing exercise that is either completed in class or outside of class.<sup>204</sup> For example, the professor can require the students to draft a contract, interrogatory, document request, complaint, answer, statute, demand letter, or will. Then, in class, the professor can project the document, and the professor and students can live-edit the document and provide feedback to the author or authors. While this takes class time, providing feedback to the class as a whole saves time on providing individual feedback on all of the papers.

### 3. Commercial Presentation Programs

Computer presentation programs are computer software packages that generally display information in slideshow form.<sup>205</sup> Each page or “slide” contains graphics, text, movies, or other objects.<sup>206</sup> The most common computer presentation programs are Microsoft PowerPoint<sup>207</sup> and Corel Presentations.<sup>208</sup>

Computer presentation programs can be used to provide an opportunity for self-assessment and assessment by the professor. First, professors can use these programs to create games that can be used to review or reinforce material that the professor has covered or on which the professor has assigned reading.<sup>209</sup> These games can mimic popular game shows like “So You Want to be a Millionaire,” “Family Feud,” and

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<sup>204</sup> Professors can assign a group of students to work collaboratively to complete a writing exercise outside of class via a wiki or email. *See infra* Parts V(B)(1)-(2).

<sup>205</sup> *See* Reis, *supra* note 171, at 58.

<sup>206</sup> *See id.*

<sup>207</sup> *PowerPoint 2010*, MICROSOFT OFFICE, <http://office.microsoft.com/en-us/powerpoint> (last visited June 27, 2012).

<sup>208</sup> COREL, [www.corel.com](http://www.corel.com) (last visited June 27, 2012). For examples of other common computer presentation programs, see also PREZI, <http://prezi.com/> (last visited June 27, 2012); HARVARD GRAPHICS ADVANCED PRESENTATIONS, <http://www.harvardgraphics.com/products/hgadvancedpresentations.asp> (last visited June 27, 2012); LOTUS FREELANCE GRAPHICS, <http://www-01.ibm.com/software/lotus/products/smartsuite/freelance.html> (last visited June 27, 2012); STAR OFFICE IMPRESS—PRESENTATIONS, <http://www.downloadstaroffice.com/impress.html> (last visited June 27, 2012). More recently, Google Docs, and Microsoft Web Apps allow for collaborative development of presentations. *See* GOOGLE DOCS, <http://www.google.com/google-d-s/presentations/> (last visited June 27, 2012); MICROSOFT OFFICE WEB APPS, <http://office.microsoft.com/en-us/web-apps/> (last visited June 27, 2012).

<sup>209</sup> Professors can also use audience response system software, such as TurningPoint that integrates with Microsoft PowerPoint, to create games. *See supra* note 182 (introducing TurningPoint).

“Jeopardy,” or popular board games like “Bingo.”<sup>210</sup> Once created, these games can be used year after year with minimal updating.<sup>211</sup>

Similar to audience response systems,<sup>212</sup> these games allow the professor to discover what each student has learned by listening to the responses during the game. The professor is also able to ascertain the knowledge of the class as a whole. In their attempt to answer the questions posed in the game, students can also assess their level of understanding of the subject matter. Moreover, even those students that seem to not be taking part in the game can assess their own performance by comparing what their answer would have been to the correct answer.<sup>213</sup>

On a more basic level, professors can assign students, either individually or as groups, to teach a particular topic in class using one of the computer presentation programs. The teacher can then assess the students and provide them with feedback on their presentation. These types of presentations are not only beneficial as an assessment measure; the students giving the presentation gain a deeper understanding of the material from teaching it. They also obtain experience using computer presentation programs that they are likely to use in practice<sup>214</sup> and develop their oral presentation skills.

#### 4. Interactive Whiteboards

Finally, interactive whiteboards—frequently referred to as SMART

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<sup>210</sup> Examples of games created using commercial presentation programs include “Research Jeopardy” to review research skills, “Firm Feud” to review client interviewing basics, and “So You Want to be a Citationaire” and “Bluebook Bingo” to assess citation skills. (games on file with author). An array of audio and visuals for these popular game shows are available online. See, e.g., TELEVISIONTUNES.COM, <http://www.televisiontunes.com> (last visited June 27, 2012); *Jeopardy Songs and Sound Effects Free*, AUDIOMICRO, <http://www.audiomicro.com/jeopardy-songs-and-sound-effects-free> (last visited June 27, 2012).

<sup>211</sup> There are similar types of games available online for a fee. For example, Karin Mika developed a Game Show Presenter quiz on research sources and case law. *Law Game Show*, ALMORALE.COM, <http://www.almorale.com/law/lawgameshow.html>. Game Show Presenter is a quiz making package that allows users to create their own games. *Game Show Presenter*, ALMORALE.COM, <http://www.almorale.com> (last visited June 27, 2012); see Karin Mika, *Games in the Law School Classroom: Enhancing the Learning Experience*, 18 *PERSP.* 1, 5-6 (2009) (discussing use of Game Show Presenter to create games to use in the law school classroom).

<sup>212</sup> See discussion *supra* Part V(A)(1).

<sup>213</sup> See Johanna K. P. Dennis, *Assessing Students Through PowerPoint “Games”*, THE SECOND DRAFT, Spring 2009, at 16, 17, [http://www.lwionline.org/uploads/FileUpload/Second\\_Draft\\_Spring\\_2009.pdf](http://www.lwionline.org/uploads/FileUpload/Second_Draft_Spring_2009.pdf).

<sup>214</sup> See *supra* note 171 and accompanying text (discussing use of computer presentation programs in legal practice).



Boards<sup>215</sup>—can be used in the classroom to assess student learning at the course level.<sup>216</sup> An interactive whiteboard is a piece of equipment that looks like a standard whiteboard but is linked to a computer and a projector.<sup>217</sup> When coupled with the computer and projector, the interactive whiteboard turns into a touch-sensitive version of the computer screen.<sup>218</sup> Accordingly, the presenter does not need to use a mouse to control the computer.<sup>219</sup> Rather, the presenter can manipulate the computer through the interactive whiteboard screen with a stylus or a finger.<sup>220</sup>

With the stylus or a finger, the presenter can retrieve and display any document that can be accessed from the computer.<sup>221</sup> For example, the presenter can access word processing documents, computer presentation programs, photographs, websites, or any other material online.<sup>222</sup> In addition, the presenter can write on the computer applications and save, in digital format, what is written on the interactive whiteboard during class.<sup>223</sup> In turn, the professor can post the saved file to a webpage<sup>224</sup> or distribute the file to students in digital or print format. Therefore, interactive whiteboards can provide an interactive classroom experience.

Legal educators can use interactive whiteboards to assess student learning in the classroom in the same way that they can use document cameras<sup>225</sup> and commercial presentation programs.<sup>226</sup> An added benefit is

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<sup>215</sup> The term SMART Board originates from a series of interactive whiteboards created by SMART technologies. SMART, <http://www.smarttech.com/> (last visited June 27, 2012).

<sup>216</sup> Other interactive whiteboards include *ActivBoard*, PROMETHEAN, <http://www.prometheanworld.com/en-us> (last visited June 27, 2012); *EBeam*, <http://www.e-beam.com/> (last visited June 27, 2012); *EInstruction*, <http://www.einstruction.com/> (last visited June 27, 2012); *Mimio*, <http://www.mimio.dymo.com/en-US.aspx> (last visited June 27, 2012); *Numonics*, <http://www.interactivewhiteboards.com/www/> (last visited June 27, 2012); *PolyVision*, <http://www.polyvision.com/> (last visited June 27, 2012); and *Starboard Group*, HITACHI SOLUTIONS AM., LTD., <http://www.hitachisolutions-us.com/starboard/> (last visited June 27, 2012).

<sup>217</sup> *What is an Interactive Whiteboard?*, PEARSON ELT, <http://www.pearsonlongman.com/TWBSolutions/what-is-an-IWBs.html> (last visited June 27, 2012).

<sup>218</sup> *Id.*

<sup>219</sup> *Id.*

<sup>220</sup> *Id.*

<sup>221</sup> *Id.*

<sup>222</sup> *Id.*

<sup>223</sup> *Id.* Special software also allows users to manipulate the text and images on the interactive white board. *Id.* For example, the user can rearrange the text and images or alter their size and color. *Id.*

<sup>224</sup> See *infra* notes 236-240 (discussing course management systems).

<sup>225</sup> See discussion *supra* Part V(A)(2).

<sup>226</sup> See discussion *supra* Part V(A)(3).

that changes can be made to the document in class and the changes can be saved and shared with the students digitally. For example, students can be asked to take a form contract and create a contract based on a hypothetical fact pattern. Then, the professor can project these documents for the class to view. As a class, students or the professor can provide feedback and suggest edits to the document from an organizational, macro standpoint and on a more micro level. After class, the professor can provide the students with a digital or print copy of the edited document.

#### B. Technology to Assess Student Learning Outside the Classroom

Law professors can also effectively use technology to incorporate assessment opportunities that take place outside the classroom into their curriculum. Unlike assessments that take place in the classroom, assessment measures conducted outside the classroom do not consume valuable class time. Some examples of technologies that law professors can use outside the classroom include wikis,<sup>227</sup> email,<sup>228</sup> podcasts,<sup>229</sup> screencasts,<sup>230</sup> text annotation systems,<sup>231</sup> digital video annotation software,<sup>232</sup> online bulletin boards,<sup>233</sup> blogs,<sup>234</sup> and computer assisted instruction.<sup>235</sup>

Many of these tools are available in a course management system (“CMS”)<sup>236</sup> or can be incorporated into one.<sup>237</sup> Similar to law practice management software,<sup>238</sup> CMSs are packages of software that provide educators with a website and associated tools that they can employ to administer and teach the course.<sup>239</sup> These software packages generally include, among other things: internal webpages where professors can post

<sup>227</sup> See discussion *infra* Part V(B)(1).

<sup>228</sup> See discussion *infra* Part V(B)(2).

<sup>229</sup> See discussion *infra* Part V(B)(3).

<sup>230</sup> See discussion *infra* Part V(B)(4).

<sup>231</sup> See discussion *infra* Part V(B)(5).

<sup>232</sup> See discussion *infra* Part V(B)(6).

<sup>233</sup> See discussion *infra* Part V(B)(7).

<sup>234</sup> See discussion *infra* Part V(B)(8).

<sup>235</sup> See discussion *infra* Part V(B)(9).

<sup>236</sup> Course management systems are also referred to as virtual learning environments, learning management systems, content management systems, or learning content management systems.

<sup>237</sup> Some examples of course management systems that are frequently used in legal education include BLACKBOARD, <http://www.blackboard.com/> (last visited June 27, 2012), and The West Education Network (“TWEN”), *Administrators Guide to TWEN: The West Education Network*, WESTLAW, <http://store.westlaw.com/administrators-guide-to-twen-west-education-network/1-5702-5/RM157025/productdetail> (last visited June 27, 2012).

<sup>238</sup> See *supra* notes 165-168 and accompanying text (discussing role of law practice management software in law practice today).

<sup>239</sup> See Heminway, *supra* note 145, at 267-68.

announcements, syllabi, assignments, and course-related documents and links; online bulletin boards; email capabilities; assessment mechanisms; places for students to upload their assignments; and wikis.<sup>240</sup> Accordingly, a CMS serves as an easy means to incorporate many of the following technologies to assess student learning.

### 1. Wikis<sup>241</sup>

A wiki is a type of collaborative software that legal educators can easily use to their advantage to incorporate more assessment opportunities into their curriculum. Specifically, a wiki is a website that allows multiple users to edit, add, or delete the webpage content from their own computer using any web browser.<sup>242</sup> Wikis can be private or public,<sup>243</sup> and the users collaborate in forming the content of the website using an online editor, commonly described as a WYSIWYG (“What You See Is What You Get”) editor.<sup>244</sup> The most well-known wiki is Wikipedia, a collaborative online encyclopedia that is the largest wiki site in the world.<sup>245</sup> Numerous hosted wiki services exist.<sup>246</sup> In addition, most CMSs have built-in wiki capabilities.<sup>247</sup>

There are many benefits—beyond learning the substantive information—to incorporating wikis into the curriculum. First, digital natives like to work collaboratively with their peers,<sup>248</sup> and “[w]ikis are ideally suited to the deliberative and collaborative development of

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<sup>240</sup> See *id.* Some CMSs now also have blog capabilities.

<sup>241</sup> The term “wiki” is a Hawaiian word that means quickly. See Noveck, *supra* note 169, at 4.

<sup>242</sup> See Samantha A. Moppett, *Wikis While You Work: Incorporating Wikis in the Classroom*, THE SECOND DRAFT, Spring 2009, at 12, 12, [http://www.lwionline.org/uploads/FileUpload/Second\\_Draft\\_Spring\\_2009.pdf](http://www.lwionline.org/uploads/FileUpload/Second_Draft_Spring_2009.pdf); Noveck, *supra* note 169, at 4; Wiki, WIKIPEDIA, <http://en.wikipedia.org/wiki/Wiki> (last visited June 27, 2012). The majority of wiki software also allows the user to track the changes that students make to a wiki and revert back to earlier versions of the wiki. Moppett, *supra*, at 12.

<sup>243</sup> Noveck, *supra* note 169, at 4. While some wikis are open and anyone can add content, others are private and only those with permission and a password can contribute. *Id.* Alternatively, a wiki can be set up to allow some participants to post and limit others to editing the wiki. *Id.*

<sup>244</sup> See Moppett, *supra* note 242, at 12.

<sup>245</sup> Wiki, *supra* note 242; see Moppett, *supra* note 242, at 12; John Sirman, *The Year of the Wiki*, 68 TEX. B.J. 114, 114 (2005).

<sup>246</sup> While some of the wiki services are free, other charge a fee. For a comparison of wiki tools, see WIKIMATRIX, <http://www.wikimatrix.org/> (last visited June 27, 2012).

<sup>247</sup> See *supra* notes 236-240 and accompanying text (discussing CMSs).

<sup>248</sup> See *supra* note 152 and accompanying text.

knowledge.”<sup>249</sup> Second, creating a wiki in law school will help to prepare the students for the use of wikis in law practice today.<sup>250</sup>

Finally, assigning students to write a wiki with some of their peers affords an efficient means to offer assessment opportunities. Working together on a wiki provides an opportunity for students to get feedback from their peers and to assess how they themselves are performing.<sup>251</sup> Professors can also provide students with feedback on the wiki. An added benefit is that projects created by a group of students via a wiki decrease the professor’s workload, as there are fewer assignments that require feedback.<sup>252</sup>

Wikis can be incorporated into the legal curriculum in various ways. For example, law professors can require students to take turns posting the notes for each class on a wiki.<sup>253</sup> Through this wiki the students can work with their peers to construct a common understanding of the substantive material in the course.<sup>254</sup> In effect, the students can teach themselves through the collaborative writing and editing of the wiki to explain the material covered in class.<sup>255</sup> Moreover, the professor can ascertain whether the students grasp the legal concepts covered in class.

Law professors can also have students draft legal documents, write sample exam answers, or analyze hypotheticals via a wiki. For instance, students can be asked to draft or edit a complaint, answer, will, or contract clause. In addition to the self-assessment and feedback received from peers while creating the wiki, the students can receive additional feedback on the document from their professor<sup>256</sup> or from their professor and peers during class through the use of a document camera or interactive whiteboard.<sup>257</sup>

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<sup>249</sup> Noveck, *supra* note 169, at 7. There are immeasurable pedagogical benefits to cooperative and collaborative learning. Elizabeth L. Inglehart, Kathleen Dillon Narko & Clifford S. Zimmerman, *From Cooperative Learning to Collaborative Writing in the Legal Writing Classroom*, 9 LEGAL WRITING: J. LEGAL WRITING INST. 185, 187-88 (2003); Moppett, *supra* note 242, at 12.

<sup>250</sup> See *supra* note 169 and accompanying text (addressing use of wikis in legal practice).

<sup>251</sup> See Noveck, *supra* note 169, at 8 (“By creating an internal, class-based wiki, students can teach and learn from each other.”).

<sup>252</sup> *Id.*

<sup>253</sup> *Id.*

<sup>254</sup> *Id.*

<sup>255</sup> *Id.*

<sup>256</sup> For example, the professor could provide the feedback via a podcast, *see* discussion *infra* Part V(B)(3), screencast, *see* discussion *infra* Part V(B)(4), or annotated PDF, *see* discussion *infra* Part V(B)(5).

<sup>257</sup> See Curcio, *supra* note 23, at 907; discussion *supra* Parts V(A)(2), V(A)(4).

## 2. Email

Electronic mail, commonly called email, is one technological tool that even technophobes can feel comfortable using to assess student learning outside the classroom. In essence, email is a system by which individuals can send and receive electronic messages between personal computers via a computer network.<sup>258</sup> Email is a standard feature of a CMS.<sup>259</sup>

Over the last forty years, email has developed into one of the prevailing methods of written communication with its own conventions and rules. Every week, people send trillions of emails.<sup>260</sup> As such, email is an essential tool in the practice of law as its use has surpassed the use of memos and letters as the predominant means by which lawyers communicate with each other and their clients.<sup>261</sup> Accordingly, law students must be proficient in communicating via email. Therefore, using email as a tool to assess student learning not only provides a means to give students feedback; it also trains students to send professional emails.

In addition to facilitating questions from students too shy to ask questions in class, continuing discussions begun in class, and making it possible to email announcements regarding administrative matters,<sup>262</sup> legal educators can use email to incorporate assessment measures. For example, professors can email students a short-answer question, hypothetical, or sample essay question and require students to submit an answer to the professor—via email—by a particular deadline.<sup>263</sup> Similar to wikis, professors can also employ email to conduct collaborative writing

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<sup>258</sup> *Email*, THE FREE DICTIONARY, <http://www.thefreedictionary.com/email> (last visited June 27, 2012). Email predates the creation of the Internet; the encoding standards were introduced as early as 1973. *Email*, WIKIPEDIA, <http://en.wikipedia.org/wiki/email> (last visited June 27, 2012).

<sup>259</sup> See *supra* notes 236-240 and accompanying text (discussing course management systems).

<sup>260</sup> Email is the top online pursuit in the United States, with more than 147 million people using email on nearly a daily basis. *Email Statistics*, POWERPRO DIRECT, [http://powerprodirect.com/index.php?option=com\\_content&view=article&id=132:email-statistics&catid=63:blog&Itemid=50](http://powerprodirect.com/index.php?option=com_content&view=article&id=132:email-statistics&catid=63:blog&Itemid=50) (last visited June 27, 2012). In 2007, individuals were sending an average of 274 personal emails a week. *Id.* The number of business emails sent a week was even greater, averaging 304. *Id.*

<sup>261</sup> Steven V. Armstrong & Timothy P. Terrell, *The Perils of Email*, 14 PERSP. 166, 166 (2006).

<sup>262</sup> See Richard Warner et al., *Teaching Law with Computers*, 24 RUTGERS COMPUTER & TECH. L.J. 107, 143-47 (1998) (noting benefits of email).

<sup>263</sup> See Lasso, *Students Learning*, *supra* note 24, at 105. Legal educators can either create the questions themselves or simply take the questions from the “Questions” sections in case books.

projects.<sup>264</sup> Collaborative writing of these types of assignments via email has similar benefits to using wikis, including a decreased workload on the professor, particularly in large classes.<sup>265</sup>

Email not only provides a vehicle for incorporating assessment measures but also provides a means for providing students with feedback without sacrificing class time. For example, professors can email specific feedback to each student or student group in response to their particular email submission. Alternatively, the professor can email a sample answer to the students in the text of the email or via an attachment of an annotated file,<sup>266</sup> a screencast,<sup>267</sup> or a podcast.<sup>268</sup> The students can compare their answer to the sample answer to assess their own performance.

Finally, student answers can be emailed to other students and the professor can ask students to assess their peers based on a rubric that the professor provides.<sup>269</sup> Once the student or students have assessed their peer's work, the professor can post a sample answer as additional feedback for the students. In addition, the professor can assess the knowledge level of both the students who originally created the document and the students who commented on it.

### 3. Podcasts

Put simply, the term "podcast" refers to digital media files that can be listened to on portable media players or a personal computer.<sup>270</sup> Podcasts are easy to create and make available to students. Anyone can create a podcast by recording an audio file through the use of a digital voice

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<sup>264</sup> See discussion *supra* Part V(B)(1) (discussing wikis). Professor I. Trotter Hardy of the College of William and Mary School of Law reported an innovative example of this. Warner, *supra* note 262, at 144-47. He assigned a class of fourteen seminar students to draft a constitution for a hypothetical country, using only email communication. *Id.*

<sup>265</sup> See *supra* notes 249-255 and accompanying text (cataloguing benefits of wikis).

<sup>266</sup> See discussion *infra* Part V(B)(5) (discussing text annotation systems).

<sup>267</sup> See discussion *infra* Part V(B)(4) (discussing screencasts).

<sup>268</sup> See discussion *infra* Part V(B)(3) (discussing podcasts).

<sup>269</sup> Alternatively, the professor can display the document on a document camera or interactive whiteboard and have the students and professor provide feedback in class. See discussion *supra* Parts V(A)(2), V(A)(4); *supra* note 109 (discussing rubrics).

<sup>270</sup> See Diane Murley, *Regular Features: Technology for Everyone . . . : Podcasts and Podcasting for Law Librarians*, 99 LAW LIBR. J. 675, 675 (2007); Roy Balleste et al., *Podcasting, Vodcasting, and Law Libraries: How to Understand the Newest "It" Technology and Use It in Your Library*, AALL SPECTRUM, June 2006, at 8. The term "podcast" originates from a combination of the words "iPod" and "broadcast." *Definition of:* *Podcast*, PCMAG.COM, [http://www.pcmag.com/encyclopedia\\_term/0,1237,t=podcast&i=49433,00.asp](http://www.pcmag.com/encyclopedia_term/0,1237,t=podcast&i=49433,00.asp) (last visited June 27, 2012).

recorder or free digital audio editor and recording programs.<sup>271</sup> Once the podcast is recorded, the professor can upload it to a thumb drive, media server, CMS, or podcast hosting service.<sup>272</sup> Then, students can easily access the podcast from within a web browser.<sup>273</sup>

Podcasts present yet another technological tool that professors can use to incorporate assessment measures outside the classroom. For example, law professors can require individual students or groups of students to create a podcast that reviews the material covered in class or that introduces a new topic tangentially related to what is covered in class. Subsequently, the professor can listen to the podcast to assess the student's or students' knowledge and then post it on the CMS for other students to listen to.

Podcasts are also particularly well-suited to bestowing feedback outside the classroom. For example, professors can assign students—either individually or as a group—to answer a hypothetical or sample exam question, complete a short-answer question, or draft a legal document. The student or students can submit the assignment as a word-processing document on paper or upload it online, via a wiki<sup>274</sup> or via email.<sup>275</sup> Once submitted, the professor can provide individual critique on each of the assignments, placing numbers in the margins that correspond to comments related to the material in that part of the text, with each number corresponding to a numbered audio file.<sup>276</sup> Alternatively, the professor can provide one global comment podcast for each submission addressing what the student or students did well and what needs work.

Podcasts also afford an opportunity for self-assessment on the part of the student or students. Rather than individually commenting on all of the assignments submitted, the professor can create a sample answer. On the sample answer, the professor can place numbered comments that correspond to audio files that discuss why the sample is correct<sup>277</sup> or provide one global comment.

There are additional benefits to using this medium to provide

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<sup>271</sup> See Sabrina DeFabritiis, *Can You Hear Me Now? Using Voice Comments to Provide Feedback on Student's Memoranda*, THE SECOND DRAFT, Spring 2009, at 7, 7, [http://www.lwionline.org/uploads/FileUpload/Second\\_Draft\\_Spring\\_2009.pdf](http://www.lwionline.org/uploads/FileUpload/Second_Draft_Spring_2009.pdf); Vinson, *supra* note 132, at 410 (explaining how to create a podcast). One popular free open source software for recording and editing is Audacity. See AUDACITY, <http://audacity.sourceforge.net/> (last visited June 27, 2012).

<sup>272</sup> See Vinson, *supra* note 132, at 410.

<sup>273</sup> See *id.*

<sup>274</sup> See discussion *supra* Part V(B)(1) (discussing wikis).

<sup>275</sup> See discussion *supra* Part V(B)(2) (discussing email).

<sup>276</sup> See DeFabritiis, *supra* note 271, at 7.

<sup>277</sup> These numbered comments can also correspond to a rubric that the professor uses to assess the assignment. See *supra* note 109 (discussing rubrics).

feedback. First, the information is delivered in a manner which appeals to different learning styles.<sup>278</sup> Moreover, podcasts as a teaching tool enhance the law school experience because of their convenience, transportability, and simplicity.<sup>279</sup>

#### 4. Screencasts

A screencast,<sup>280</sup> also referred to as a video screen capture, is similar to a podcast but with visual aids.<sup>281</sup> In essence, a screencast is a screen capture and screen recording tool that allows a person to create a video of the changes that a user sees on the computer screen, along with an audio narration.<sup>282</sup> The video can contain images of websites, PowerPoint presentations, imported media files, and anything else that can be placed on the computer screen.

During the screencast, the presenter can draw the audiences' attention to material on the screen by moving the cursor or highlighting material. In addition, the presenter can edit material on the screen during the screencast. To view the screencast the student simply opens the file and clicks play.<sup>283</sup>

Pedagogically, there are many benefits to incorporating screencasts into the curriculum. For example, students can view the screencasts at their

<sup>278</sup> See Vinson, *supra* note 132, at 408.

<sup>279</sup> *Id.*

<sup>280</sup> There are numerous screencast applications. See, e.g., *Adobe Captivate*, ADOBE.COM, [http://success.adobe.com/en/na/sem/products/1110\\_2800\\_captivate.html?sdid=EQFPS&skwcid=TC|22196|adobe%20captivate||S|b|626610170](http://success.adobe.com/en/na/sem/products/1110_2800_captivate.html?sdid=EQFPS&skwcid=TC|22196|adobe%20captivate||S|b|626610170) (last visited June 27, 2012); *BBFlashback*, BBSOFTWARE.COM, <http://www.bbsoftware.co.uk/bbflashback/home.aspx> (last visited June 27, 2012); *CamStudio*, CAMSTUDIO.ORG, <http://camstudio.org/> (last visited June 27, 2012); *Camtasia Studio*, TECHSMITH.COM, <http://www.techsmith.com/camtasia.html> (last visited June 27, 2012); *Fraps*, FRAPS.COM, <http://www.fraps.com/> (last visited June 27, 2012); *iShowU*, SHINYWHITEBOX.COM, <http://www.shinywhitebox.com/> (last visited June 27, 2012); *Jing*, TECHSMITH.COM, <http://www.techsmith.com/jing.html> (last visited June 27, 2012); *ScreenFlow*, TELESTREAM.NET, <http://www.telestream.net/screen-flow/overview-a.htm> (last visited June 27, 2012); *Wink*, DEBUGMODE.COM, <http://www.debugmode.com/wink/> (last visited June 27, 2012). For a discussion of Camtasia and Adobe Captivate screencasting software, see Diane Murley, *Technology for Everyone . . . Tools for Creating Video Tutorials*, 99 L. LIBR. J. 857 (2007).

<sup>281</sup> Screencasts are frequently used for step-by-step software tutorials and product presentations.

<sup>282</sup> See Murley, *supra* note 280, at 858. Users can record the audio narration and video separately. *Id.*

<sup>283</sup> See Alison Julien, *Using Webcasting to Expand the Classroom Walls*, THE SECOND DRAFT, Spring 2009, at 6, 6, [http://www.lwionline.org/uploads/FileUpload/Second\\_Draft\\_Spring\\_2009.pdf](http://www.lwionline.org/uploads/FileUpload/Second_Draft_Spring_2009.pdf).



own pace.<sup>284</sup> Second, conveying information in a screencast allows educators to cover subjects for which there is not enough time to cover in class. Finally, professors can use screencasts as an assessment measure as well as to provide assessment opportunities outside of class.

As an assessment measure, professors can assign a student or group of students to create a screencast on a topic using a commercial presentation program, rather than taking time during class.<sup>285</sup> For example, in a legal research and writing class, professors can assign a student or group of students to create a screencast addressing a citation rule or demonstrating the answer to a difficult citation question—using commercial presentation programs and the online *Bluebook*.<sup>286</sup> Subsequently, the professor can assess the screencast outside of class, and depending on how good the screencast is, the professor can post it on the CMS for students to view.

As a means of providing feedback, screencasts facilitate both self and instructor-based assessments. For instance, professors can assign students to answer a hypothetical or exam question, draft a legal document, or complete a series of multiple-choice questions. If the professor collects the assignments electronically, the professor can create a screencast for each assignment that provides feedback on how each student performed, identifying problems or omissions and making suggested edits. If the professor uses a rubric to assess assignments, the professor can create a dual-screen screencast where the professor provides feedback while referencing the rubric. Alternatively, rather than providing individual feedback, professors can create a screencast that reviews a sample answer or corrects a sample assignment so that students can assess their own performance.

## 5. Text Annotation Systems

Text annotation<sup>287</sup> systems allow the user to easily edit, highlight, and add notes to existing files.<sup>288</sup> If students submit their assignments

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<sup>284</sup> *Id.*

<sup>285</sup> See discussion *supra* Part V(A)(3) (discussing computer presentation programs).

<sup>286</sup> THE BLUEBOOK: A UNIFORM SYSTEM OF CITATION (Columbia Law Review Ass'n et al. eds., 19th ed. 2010), available at <http://www.legalbluebook.com>.

<sup>287</sup> An annotation is an explanatory note or comment.

<sup>288</sup> Moreover, users can embed sound and external files. *Adding Audio Comment to Your PDF*, ADOBE.COM, [http://blogs.adobe.com/edtechatadobe/2010/03/adding\\_audio\\_comment\\_to\\_your\\_p.html](http://blogs.adobe.com/edtechatadobe/2010/03/adding_audio_comment_to_your_p.html) (last visited June 27, 2012).

electronically, users can insert comments and edit the text of both word processing<sup>289</sup> and Portable Document Format (“PDF”) files.<sup>290</sup>

Similar to typical written margin comments, annotations allow the reviewer to identify and explain—in the margins—why aspects of an assignment are good and to suggest how the student can improve the assignment.<sup>291</sup> The user can also provide a global comment at the end of the assignment. In addition, there is software available that includes comments that are already drafted and that can be inserted into a Microsoft Word document via the click of the mouse.<sup>292</sup>

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<sup>289</sup> For example, Microsoft Word enables the user to edit text and insert comments. See *Microsoft Office Online*, MICROSOFT.COM, <http://office.microsoft.com/en-us/word-help/track-changes-while-you-edit-HA001218690.aspx?CTT=1> (last visited May 4, 2012); see also Barnett, *supra* note 145, at 790 n.119, 791 n.121, 792 n.123 (providing instructions on editing and inserting comments in Microsoft Word).

<sup>290</sup> A PDF preserves the visual appearance of a document including the layout, fonts, and graphics. *Portable Document Format (PDF)*, TECHTARGET.COM, [http://whatis.techtarget.com/definition/0,,sid9\\_gci214288,00.html](http://whatis.techtarget.com/definition/0,,sid9_gci214288,00.html) (last visited May 17, 2012). Examples of PDF software that allows the user to incorporate annotations include *Adobe Acrobat*, ADOBE.COM, [http://success.adobe.com/en/na/sem/products/acrobatx/1108\\_8209\\_acrobatxpro.html?kw=try&ssid=IAZXY&skwid=TC|22188|adobe%20acrobat|S|e|765629906](http://success.adobe.com/en/na/sem/products/acrobatx/1108_8209_acrobatxpro.html?kw=try&ssid=IAZXY&skwid=TC|22188|adobe%20acrobat|S|e|765629906) (last visited June 27, 2012); *Foxit Reader*, FOXITSOFTWARE.COM, [http://www.foxitsoftware.com/Secure\\_PDF\\_Reader/](http://www.foxitsoftware.com/Secure_PDF_Reader/) (last visited June 27, 2012); *Nitro PDF Reader*, NITROREADER.COM, <http://www.nitroreader.com/> (last visited June 27, 2012); and *PDF-XChange Viewer*, TRACKER-SOFTWARE.COM, <http://www.tracker-software.com/product/pdf-xchange-viewer> (last visited June 27, 2012); and *Xournal*, XOURNAL.COM, <http://xournal.sourceforge.net/> (last visited June 27, 2012). With Adobe Professional, a user can add annotations to a PDF by pointing, clicking, and typing. To add a comment, simply click on the “Review and Comment” button and choose to “Show Commenting Toolbar.” Then, click on the “Sticky Note” option and place your cursor wherever you want the comment to appear. The sticky note format allows comments of any length, but only the first twenty lines will be visible to the reader upon clicking on the sticky note. In addition, there are tools that allow the user to replace selected text, insert and delete text, and highlight selected text.

<sup>291</sup> See Barnett, *supra* note 145, at 770 (discussing electronic typed comments and editing changes). Users can also create macros to use as their annotations. See Joseph Kornowski, *Computer Counselor, Optimizing WordPerfect and Word: Getting What You Need to Ensure Peak Performance* L.A. LAW., Dec. 1996, available at <http://www.lacba.org/showpage.cfm?pageid=394> (“A macro is a series of word-processing commands that you can combine as a single command to facilitate frequent tasks. Typically, once you have created a macro, you can assign it to a menu item, toolbar button, or shortcut key to use as a built-in word-processing command.”).

<sup>292</sup> See *Annotate for Legal Writing Edition*, 11TREES.COM, <http://11trees.com/annotate-for-legal-writing.html> (last visited June 27, 2012). *Annotate for Legal Writing* contains 350 pre-written comments that the user can edit. *Id.* In addition, *Grade Assist*, PAPPASVOLK.COM, <http://www.pappasvolk.com/gradeassist>, is currently in the process of creating a version that legal educators can use to annotate student papers.

Annotated PDFs have additional benefits. For example, the student controls how he or she reviews the comments when he or she receives the annotated PDF because the student cannot immediately see the comments.<sup>293</sup> Rather, in Adobe Acrobat Professional, the student has to put the cursor over the sticky note image that identifies the comment in order to see the comment.<sup>294</sup> The student can choose when to read the comments and can focus his or her attention on one comment at a time, combating the overwhelming nature of receiving extensive margin comments on an assignment.<sup>295</sup> In addition, the students are more engaged with the comments because they are compelled to place the cursor over the sticky note image to view a comment.<sup>296</sup>

Legal educators can use annotations to provide instructor-based assessment of assignments that students submit electronically or in print.<sup>297</sup> For example, these assignments can include answering essay exam questions, drafting legal documents such as complaints and answers, or responding to short hypotheticals. The students can submit these assignments individually or collaboratively via a wiki<sup>298</sup> or email<sup>299</sup> and the professor can add comments and suggested edits.

In similar fashion, legal educators can use text annotations to provide self-based assessment opportunities. Rather than individually annotating all of the assignments, the professor can comment on a few papers that exemplify the common problems. Alternatively, the professor can post an annotated sample answer with a detailed explanation so students can assess their own progress.

Finally, annotations also afford a means of providing peer-based assessment. Specifically, rather than annotating the document themselves, professors can require students to provide their peers with detailed feedback

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<sup>293</sup> See Jennifer Murphy Romig, *Teaching Effective Legal Writing Through Annotated PDFs*, THE SECOND DRAFT, Spring 2009, at 28, 28, [http://www.lwionline.org/uploads/FileUpload/Second\\_Draft\\_Spring\\_2009.pdf](http://www.lwionline.org/uploads/FileUpload/Second_Draft_Spring_2009.pdf).

<sup>294</sup> *Id.* The student can also look at all of the comments at the same time or generate a list of changes. *Id.*

<sup>295</sup> *Id.*; see generally Kirsten K. Davis, *Building Credibility in the Margins: An Ethos Based Perspective for Commenting on Student Papers*, 12 LEGAL WRITING: J. LEGAL WRITING INST. 73 (2006) (discussing impact of margin comments).

<sup>296</sup> See Romig, *supra* note 293, at 29 (“kinesthetic act of moving the cursor represents a small but real form of engagement with annotations.”).

<sup>297</sup> If students submit their assignments as a Microsoft Word or WordPerfect document, they can be saved as a PDF file. Similarly, if students hand in a paper copy, the assignment can be scanned into a PDF file.

<sup>298</sup> See discussion *infra* Part V(B)(1) (introducing wikis).

<sup>299</sup> See discussion *infra* Part V(B)(2) (discussing email).

on the assignment. To assist in this process, professors should provide a detailed rubric for students to follow.<sup>300</sup>

## 6. Digital Video Annotation Software

Annotation as a method of providing feedback is not limited to written assignments. Similar to text annotation systems, which provide a means to assess written work, professors can use video annotation tools to view and assess video and provide students with feedback outside the classroom. Video annotation tools let users “do for video what the red pen does for papers.”<sup>301</sup>

Video annotation software allows users to upload and view a video.<sup>302</sup> These videos can be a student simulation, a clinical rehearsal, or a pre-recorded sample.<sup>303</sup> While viewing the video, the user can stop the video and identify and tag specific segments in the video.<sup>304</sup> In addition, the video annotation software allows multiple people to write comments or annotations that correspond to segments within the digital video recording.<sup>305</sup> Accordingly, there is a direct connection between the feedback and the segments of the video.

The video annotations are then saved in a separate file and can be

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<sup>300</sup> See *supra* note 109 (discussing rubrics).

<sup>301</sup> *MediaNotes*, CALI.ORG, <http://www.cali.org/medianotes> (last visited June 27, 2012). There is a variety of Digital Video Annotation Software available. See, e.g., *id.*; *Anvil*, ANVIL-SOFTWARE.DE, <http://www.anvil-software.de/> (last visited June 27, 2012); *Communicoach*, ISOPRIME.COM, <http://www.isoprime.com/communicoach/introduction.htm> (last visited June 27, 2012); *Video Annotation & Reference System*, VARS, <http://vars.sourceforge.net/> (last visited June 27, 2012); *VCode* and *VData*, UIUC.EDU, <http://social.cs.uiuc.edu/projects/vcode.html> (last visited June 27, 2012).

<sup>302</sup> Video can come from a camera hooked up to the computer or the user can input previously recorded video from a digital video tape.

<sup>303</sup> *MediaNotes*, *supra* note 301.

<sup>304</sup> *Id.*; see Gerald R. Williams, Larry C. Farmer & Melissa Manwaring, *New Technology Meets an Old Teaching Challenge: Using Digital Video Recordings, Annotation Software, and Deliberate Practice Techniques to Improve Student Negotiation Skills*, 24 *NEGOTIATION J.* 71, 80 (2008) (explaining how to use *MediaNotes* to “facilitate[] written, customizable annotation of events within a digital video recording”). *MediaNotes* also allows the user to tag events and identify specific skills using a common vocabulary developed in class. See *MediaNotes*, *supra* note 301. For example, in an appellate argument the user can tag the parts of the argument, such as the introduction, roadmap, and conclusion.

<sup>305</sup> *MediaNotes*, *supra* note 301; see also Williams et al., *supra* note 304, at 80. As with written comments on papers, the commentary can be a standardized feedback point or commentary unique to the specific video. See *id.* *MediaNotes* also allows the professor to attach examples of the preferred actions in video format. See *id.* at 81.

viewed, along with the video, by other users such as the professor or the student.<sup>306</sup> Once received, the student can effectively and efficiently review the feedback provided because the software allows them to navigate through the various segments to feedback regarding a specific portion of the video with a simple click of the mouse.<sup>307</sup>

Facilitating analysis of video, digital video annotation software is a relatively novel and helpful instrument for assessing students. Video annotation software allows professors to evaluate student performance on a particular lawyering task. For example, video annotation software is well-suited for recording student practice of negotiation, counseling, interviewing, appellate advocacy, and trial advocacy skills and providing students with feedback.

This assessment can occur on many levels. First, professors can assess the students' performance of the skills being taught using a rubric.<sup>308</sup> Second, students can annotate their peers' videos and assess their performance. Finally, video annotation software permits self-assessment. Specifically, students can annotate their own video or professors can annotate a sample of a good student simulation or pre-recorded sample that students can review.

Legal educators can also use video annotation software to incorporate assessment measures. For example, as an assessment measure, professors can ask students to comment on a clinical practice, a pre-recorded video example, or a peer's recorded simulation. By viewing the student feedback on the annotated video, the professor can gauge the student's understanding of the material.

## 7. Online Bulletin Boards

Online bulletin boards, often referred to as discussion boards, discussion forums, message boards, or online forums, are another tool that professors can use to enhance assessment opportunities beyond traditional in-class limits. Online bulletin boards are web applications that manage user-generated content.<sup>309</sup> Specifically, they provide online forums for users to engage in conversations in the form of posted messages.<sup>310</sup> Most CMSs

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<sup>306</sup> See Williams et al., *supra* note 304, at 80.

<sup>307</sup> Moreover, the user can limit the comments that he or she sees to a particular reviewer.

<sup>308</sup> See *supra* note 109 (introducing rubrics).

<sup>309</sup> See *Internet Forum*, WIKIPEDIA, [http://en.wikipedia.org/wiki/Internet\\_forum](http://en.wikipedia.org/wiki/Internet_forum) (last visited June 27, 2012).

<sup>310</sup> See *id.*; *Discussion Board*, TECHTARGET.COM, [http://whatis.techtarget.com/definition/0,,sid9\\_gci211961,00.html](http://whatis.techtarget.com/definition/0,,sid9_gci211961,00.html) (last visited June 27, 2012).

contain an online bulletin board function.<sup>311</sup>

Discussion forums on online bulletin boards are hierarchical and can consist of multiple subforums, which in turn may have several topics.<sup>312</sup> Each new discussion under a topic is referred to as a “thread” and is comprised of a series of messages—or “posts”—about the topic.<sup>313</sup> Each post by a user—or member—comprises an individual contribution to the conversation, similar to a single email.<sup>314</sup> The posts can be anonymous or attributed to a member, and the moderator—the professor—can set it up so that messages must be approved before being posted to the thread.<sup>315</sup> To read a message in a thread, the user need only click on it.<sup>316</sup> To add a message to the thread, the user can reply to an existing message or create a new topic and post a message there.<sup>317</sup>

There are numerous benefits to using online bulletin boards.<sup>318</sup> For example, unlike chat rooms, which allow for synchronous communication,<sup>319</sup> online bulletin boards allow for asynchronous communication, allowing the members to read all the posts at a convenient time.<sup>320</sup> In addition, the threads are retained indefinitely<sup>321</sup> and can be printed out. Moreover, shy or withdrawn students may be more likely to participate in a discussion on an online bulletin board.<sup>322</sup>

Finally, online bulletin boards provide an environment for instructor, peer, and self-assessment.<sup>323</sup> Professors can post short answer questions,<sup>324</sup> hypotheticals, or multiple-choice questions on the online bulletin board. Students can then post answers and receive feedback from

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<sup>311</sup> See *supra* notes 236-240 and accompanying text.

<sup>312</sup> See *Internet Forum*, *supra* note 309.

<sup>313</sup> See *id.* There are three basic display formats: non-threaded, semi-threaded, and fully-threaded. *Id.*

<sup>314</sup> *Id.*; see discussion *supra* Part V(B)(2) (discussing email).

<sup>315</sup> See *Internet Forum*, *supra* note 309.

<sup>316</sup> See *id.*

<sup>317</sup> See *id.*

<sup>318</sup> See Michael A. Geist, *Where Can You Go Today?: The Computerization of Legal Education from Workbooks to the Web*, 11 HARV. J.L. & TECH. 141, 169-71 (1997) (discussing benefits and drawbacks of discussion groups). In fact, Villanova University School of Law now automatically establishes a discussion group for every course offered. See *id.*

<sup>319</sup> Synchronous communication is communication all at the same time. Frank G. Evans et al., *Enhancing Worldwide Understanding Through ODR: Designing Effective Protocols for Online Communications*, 38 U. TOL. L. REV. 423, 432 (2006)

<sup>320</sup> Asynchronous communication refers to discussion over time. *Id.* at 433.

<sup>321</sup> See Warner et al., *supra* note 262, at 148.

<sup>322</sup> See Geist, *supra* note 318, at 169-71.

<sup>323</sup> *Id.*

<sup>324</sup> The professor can either draft the questions or use the questions in the casebook.

their professor and peers.<sup>325</sup> The discussion can also provide an opportunity for students to assess their own understanding of the material. In addition, professors can gauge whether students comprehend course material by following the discussion on the online bulletin board.<sup>326</sup>

## 8. Blogs

In general, a blog, or web log, is a website that contains a writer's or group of writers' experiences, observations, insights, and opinions, frequently combined with images and links to other websites.<sup>327</sup> This collection of writings appears in reverse chronological order.<sup>328</sup>

In addition to these blog entries, blogs also have a comment feature where people can make remarks or respond to the blog entries.<sup>329</sup> This interactivity, the ability to comment on blog entries, distinguishes blogs from other static websites.<sup>330</sup> By the end of 2011, there were over 188 million public blogs in the blogosphere.<sup>331</sup>

The blogosphere is comprised of various types of blogs, differing in terms of who can post, the type of content, and the manner in which the content is delivered.<sup>332</sup> For example, in terms of who can post, a personal blog, an ongoing diary or commentary by an individual, is the traditional, most common type of blog.<sup>333</sup> There are also blogs that are authored by multiple authors.<sup>334</sup> In the academic arena, these blogs can be course blogs

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<sup>325</sup> See Geist, *supra* note 318, at 169-71. Professors can also use online bulletin boards to conduct online lessons. See *id.* (discussing a Contracts class that covered Statute of Frauds online via “a moderated discussion that included questions posed to the entire class and commentary on the responses received from students”).

<sup>326</sup> See *id.*

<sup>327</sup> See FRANCES JACOBSEN HARRIS, I FOUND IT ON THE INTERNET: COMING OF AGE ONLINE 61 (2d ed. 2010) (defining a blog as a “personal website that consists of brief entries generally written by one person”).

<sup>328</sup> See Yoany Beldarrain, *Distance Education Trends: Integrating New Technologies to Foster Student Interaction and Collaboration*, 140 DISTANCE EDUC. 139, 140-42 (2006).

<sup>329</sup> See Windy Schweder & Cheryl A. Wissick, *Bloggling In and Out of the Classroom*, 22 J. SPECIAL EDUC. TECH. 63, 63 (2007).

<sup>330</sup> See *id.*

<sup>331</sup> NIELSEN, STATE OF THE MEDIA: U.S. DIGITAL CONSUMER REPORT: Q3-Q4 2011 (2012), available at <http://www.nielsen.com/content/dam/corporate/us/en/reports-downloads/2012-Reports/Digital-Consumer-Report-Q4-2012.pdf>.

<sup>332</sup> See *infra* notes 333-335 and accompanying text. Twitter is a microblogging service that allows the user to post short entries of up to 140 characters in length “via the web, text messaging, and a variety of third-party applications.” HARRIS, *supra* note 327, at 62.

<sup>333</sup> HARRIS, *supra* note 327, at 61 (“Blogs are ‘personal’ only insofar as they reflect an identifiable voice or tone.”).

<sup>334</sup> *Id.* at 61-62.

where all students enrolled in the course can contribute to the blog by posting entries and comments.<sup>335</sup> They can also be group blogs, wherein subsets of students in the course can post blog entries and comments while the remaining students in the course can only post comments. Generally, professors can edit and delete entries and comments.

Professors can use blogs to implement out-of-class assessment measures into the curriculum. For example, professors can instruct students to keep a personal blog throughout the semester that documents their progress and reflects on the learning process or contains opinion pieces on material covered in class.<sup>336</sup> Alternatively, professors can create a group or course blog and require students to post periodically on various topics such as newly decided cases, news, or ongoing litigation that is relevant to the class.<sup>337</sup>

During the semester, students can receive feedback from their peers and professor through the blog's comment function. In addition, at the end of the semester the professor can review the blog and provide students with feedback on their reflections and development in the course. Finally, students can assess themselves by reading the comments and the posts of their professor and peers.

## 9. Computer Assisted Instruction

Having its roots in the behaviorist theories,<sup>338</sup> computer assisted

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<sup>335</sup> See Matthew T. Bodie, *Open Access in Law Teaching: A New Approach to Legal Education*, 10 LEWIS & CLARK L. REV. 885, 893-94 (2006) (discussing use of class blogs in legal education).

For some examples of class blogs, see *Copyfutures*, TYPEPAD.COM, <http://lsolum.typepad.com/copyfutures> (last visited June 27, 2012); *ip + internet*, IPINTERNET.COM, <http://ipinternet.blogspot.com/> (last visited June 27, 2012). See Michael Madison, *Law Teaching and Social Soft[ware]*, MADISONIAN.NET (Jan. 22, 2006), <http://madisonian.net/archives/2006/01/22/law-teaching-and-social-software/> [sic], for a discussion of law school blogs.

<sup>336</sup> See Beldarrain, *supra* note 328, at 141 (noting that “[e]ach student blog is a reflective piece, documenting the student’s personal and intellectual growth throughout the course”).

<sup>337</sup> See Schweder & Wissick, *supra* note 329 (discussing use of classroom blogs in secondary education).

<sup>338</sup> *Computer-Based Training*, EDUCTECHWIKI, [http://edutechwiki.unige.ch/en/Computer-based\\_training](http://edutechwiki.unige.ch/en/Computer-based_training) (last modified Aug. 8, 2009). Interestingly, going as far back as 1921, Edward Thorndike wrote, “If, by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one would page two become visible, and so on, much that now requires personal instruction could be managed by print.” *Id.*



instruction (“CAI”)<sup>339</sup> is an “interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place.”<sup>340</sup> To improve student learning, CAI features a combination of text, graphics, sound, and audio.<sup>341</sup> While CAI can be used alone to instruct students, the combination of conventional or “face-to-face instruction” and CAI is the most effective in increasing student performance.<sup>342</sup> The term CAI encompasses various different pedagogical strategies that have numerous benefits as a teaching and assessment tool.

#### a. Pedagogical Strategies

CAI pedagogical strategies include, among other things, drill-and-practice,<sup>343</sup> tutorials,<sup>344</sup> games,<sup>345</sup> simulations,<sup>346</sup> discovery,<sup>347</sup> and problem solving.<sup>348</sup> This article focuses on drill and practice,<sup>349</sup> tutorials,<sup>350</sup> and games<sup>351</sup> because they lend themselves to assessment opportunities. Each of these pedagogical strategies allows professors to incorporate multiple assessment opportunities that take place outside the classroom into their curriculum.

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<sup>339</sup> CAI is also referred to as, among other things, computer aided instruction (“CAI”), computer assisted learning (“CAL”), computer based education (“CBE”), computer based instruction (“CBI”), computer based training (“CBT”), web based instruction (“WBI”), and web based training (“WBT”). All of these terms refer to the use of a computer to provide instruction. *Computer Assisted Instruction*, WIKIEDUCATOR, [http://www.wikieducator.org/Computer\\_Assisted\\_Instruction\\_\(CAI\)](http://www.wikieducator.org/Computer_Assisted_Instruction_(CAI)) (last modified Sept. 19, 2008, 06:16 AM).

<sup>340</sup> *See id.*

<sup>341</sup> *See id.*

<sup>342</sup> *What Is Computer-Assisted Instruction?*, WISEGEEK, <http://www.wisegeek.com/what-is-computer-assisted-instruction.htm> (last visited June 27, 2012). CAI is used throughout the educational process, from preschool to professional school, and is also used to train employees. *Id.* Students who are engaged in CAI exhibit improved attitudes towards the learning process and perform moderately better than students who do not use CAI. *Id.*

<sup>343</sup> *See discussion infra* Part V(B)(9)(a)(i).

<sup>344</sup> *See discussion infra* Part V(B)(9)(a)(ii).

<sup>345</sup> *See discussion infra* Part V(B)(9)(a)(iii).

<sup>346</sup> Simulation software allows the student to learn in a simulation of the real world without the real risks. *See Computer Assisted Instruction, supra* note 339.

<sup>347</sup> With discovery, the student is provided with “a large database of information specific to a course or content area and [the student is] challenge[d] . . . to analyze, compare, infer and evaluate based on their exploration of the data.” *Id.*

<sup>348</sup> This pedagogical strategy focuses on developing the student’s problem solving skills. *Id.*

<sup>349</sup> *See discussion infra* Part V(B)(9)(a)(i).

<sup>350</sup> *See discussion infra* Part V(B)(9)(a)(ii).

<sup>351</sup> *See discussion infra* Part V(B)(9)(a)(iii).

## i. Drill and Practice

Drill and practice, one of the most common types of educational software, generally denotes an instructional strategy that focuses on reviewing information that has already been learned.<sup>352</sup> This type of software “promotes the acquisition of knowledge or skill through systematic training by multiple repetitions.”<sup>353</sup> Similar to an automated flash card, students answer questions one at a time and receive immediate feedback.<sup>354</sup>

Professors can easily create self-scoring multiple-choice quizzes. Most CMSs provide the means to create automatically scored quizzes,<sup>355</sup> and in addition, independent drill and practice programs exist.<sup>356</sup> The professor or teaching assistant can draft the questions and place the questions online at the beginning of the semester before the course begins. The professor can also assign the students to create questions for the class.

Professors can use drill and practice exercises to address any number of things. For example, the exercise can include questions that exemplify the types of multiple choice questions that students will see on their exam or review key points addressed in the assigned reading.<sup>357</sup> In addition, professors can use these exercises to assess, among many other things, a student’s ability to read an opinion, synthesize a rule, or identify analytically significant facts.<sup>358</sup>

## ii. Tutorials

While the purpose of drill and practice software is to review information, tutorials are designed to educate the user.<sup>359</sup> Generally, tutorials begin by instructing the student on an aspect of the topic to be

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<sup>352</sup> See *Computer Assisted Instruction*, *supra* note 339.

<sup>353</sup> ENCYCLOPEDIA OF THE SCIENCES OF LEARNING 1040 (Norbert M. Seel ed. 2012).

<sup>354</sup> See *Computer Assisted Instruction*, *supra* note 339.

<sup>355</sup> See *supra* notes 236-240 and accompanying text (discussing CMSs).

<sup>356</sup> One example is Cyber Workbooks. CYBERWORKBOOKS.COM, <http://www.cyberworkbooks.com/> (last visited June 27, 2012). Among other things, Cyber Workbooks has a feature that allows for self-assessment: the platform times, scores, and records student responses. *Id.*

<sup>357</sup> See Sergienko, *supra* note 85, at 485-505 (discussing multiple-choice questions); see generally Samantha A. Moppett, *Research Diagnostics: An Interactive Assessment Tool*, THE SECOND DRAFT, Spring 2008, at 7, 7, available at <http://www.lwionline.org/publications/seconddraft/spring08.pdf> (addressing use of multiple-choice questions to reinforce research skills).

<sup>358</sup> See Sergienko, *supra* note 85, at 496-505.

<sup>359</sup> Monica Ward, *Chapter 2: Computer Assisted Instruction and Learning Issues*, DCU SCHOOL OF COMPUTING 17, 19, <http://www.computing.dcu.ie/~mward/mthesis/chapter2.pdf> (last visited June 27, 2012).

covered.<sup>360</sup> Then, the tutorial provides the user with an opportunity to practice the material learned and assess the user's knowledge.<sup>361</sup> Depending on how well the student performs, the tutorial will remediate by re-teaching the material or move on to provide further instruction. Accordingly, tutorials also "assess the learner."<sup>362</sup>

Currently, there are numerous free web-based tutorials available for legal educators to use. Most notably, the Center for Computer Assisted Legal Instruction ("CALI")<sup>363</sup> offers tutorials on many legal fields of study.<sup>364</sup> Additional examples include LexisNexis and Westlaw, which provide tutorials on legal research and citation.<sup>365</sup> Professors can also craft their own tutorials using free software.<sup>366</sup>

### iii. Games

In light of the omnipresent influence of video games on American culture,<sup>367</sup> educators are striving to harness the motivating facets of this third CAI pedagogical strategy—game software—to facilitate learning and increase assessment opportunities.<sup>368</sup> In essence, game software mimics video games and creates a competitive environment wherein the user is competing against other students or the computer.<sup>369</sup> The objective of the computer game is to reinforce material that the user has already been taught.<sup>370</sup> Currently, there are some law video games available.<sup>371</sup>

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<sup>360</sup> See *id.*

<sup>361</sup> See *id.*; *Computer Assisted Instruction*, *supra* note 339 (noting tutorials include drill and practice, games, or simulations).

<sup>362</sup> See Ward, *supra* note 359, at 19.

<sup>363</sup> CALI, <http://www.cali.org/> (last visited June 27, 2012).

<sup>364</sup> See *id.* for a list of topics covered by CALI.

<sup>365</sup> See, e.g., ICW, LEXISNEXIS.COM, <http://www.lexisnexis.com/icw/> (last visited June 27, 2012) (Interactive Citation Workstation covers *ALWD* and *Bluebook* citation); *Lexis Advance*, LEXIS.COM, <https://advance.lexis.com/> (last visited June 27, 2012) (providing tutorials on researching in Lexis Advance; click "Help" and then "Tutorials"); *Market Info Display*, WESTLAW.COM, <http://lawschool.westlaw.com/shared/marketinfodisplay.asp?code=WT&id=1> (last visited June 27, 2012) (supplying tutorials on researching using Westlaw).

<sup>366</sup> For example, CALI provides free software called CALI Author that allows professors to create their own tutorials. *Cali Author*, CALI, <http://www.cali.org/caliauthor> (last visited June 27, 2012).

<sup>367</sup> See *supra* note 142 (noting the number of hours that the average law student has spent playing video games).

<sup>368</sup> See Sonsteng et al., *supra* note 2, at 414-15.

<sup>369</sup> See *Computer Assisted Instruction*, *supra* note 339.

<sup>370</sup> See Ward, *supra* note 359, at 19.

<sup>371</sup> For example, there are two games that introduce students to criminal law—*Murder*

As a teaching tool, gaming is particularly effective for adult learners<sup>372</sup> as video games present many of the characteristics reminiscent of a successful learning environment.<sup>373</sup> Specifically, the “[g]ame players control their actions, pursue their own goals, challenge themselves to the optimal extent of their abilities, and receive feedback on their performance.”<sup>374</sup> In addition, the leaders in the area of learning-through-game-playing have observed a number of benefits of using video games as a teaching tool as compared to conventional teaching methods.<sup>375</sup> Despite these numerous benefits, legal education has yet to fully harness the potential of game software.

#### b. Benefits of Computer Assisted Instruction

CAI allows professors to create opportunities for instructor-based assessment and self-assessment of student learning at the course level.<sup>376</sup> Instant feedback allows students to self-evaluate whether they understand the legal concepts covered in the class.<sup>377</sup> The assessment results also permit the professor to gauge whether a particular student or the class as a

*One and Drug Bust*—that are suitable for an introductory class. See John McClusky, *Review of Two CD-ROM's: MurderOne and Drug Bust*, 3 J. CRIM. JUST. & POPULAR CULTURE 127, 127-28 (1995); Sonsteng et al., *supra* note 2, at 416 (describing *Murder One* and *Drug Bust*). Other games include *In the First Degree* and *Ace Attorney*. See Sonsteng et al., *supra* note 2, at 416; Robert Widdison et al., *Computer Simulation in Legal Education*, 5 INT'L J.L. & INFO. TECH. 279, 297 (1997).

<sup>372</sup> See Sonsteng et al., *supra* note 2, at 415. The United States Army has used game software extensively as a training tool. See *id.* at 416. Moreover, firefighters and health care workers employ game software to instruct their trainees because it teaches the trainees how to react to pertinent circumstances. *Id.*

<sup>373</sup> See *id.* at 414-15. Gaming software creates a successful learning environment by “providing clear goals, challenging students, allowing for collaboration, using criterion based assessments, giving students more control over the learning process, and incorporating novelty into the environment.” *Id.*

<sup>374</sup> *Id.* at 415.

<sup>375</sup> See *id.* Specifically, gaming software allows students to place themselves into a different role and attempt to “solve problems they have not mastered, receive immediate feedback on the consequences, and try again.” *Id.* Games are more engaging than course books because they permit the student to immediately perform the skill rather than waiting until they have attained expertise. *Id.* Moreover, games motivate students to better their performance because games “keep things ‘pleasantly frustrating.’” *Id.*

<sup>376</sup> See STUCKEY ET AL., *supra* note 12, at 255 (noting formative assessment opportunities provided by computerized and automatically scored quizzes).

<sup>377</sup> See *id.*; Lasso, *Students Learning*, *supra* note 24, at 97. This instant feedback on multiple assessments enhances student performance. See Newman, *supra* note 135, at 200. Student performance is also enhanced because students are encouraged to continue working until they comprehend the material being tested. See *id.*

whole understands a legal concept.<sup>378</sup>

Another benefit of CAI is the manner in which the students receive the feedback.<sup>379</sup> Significantly, students receive instant feedback on their performance. Moreover, this feedback is private, which may help shy or slow learners who fear making an error in class.<sup>380</sup> Another defining characteristic of CAI feedback is that it is individualized and students can proceed at their own pace.<sup>381</sup> For example, with tutorials, students can review material as many times as they want and repeat the tasks. Similarly, students can retake drill and practice quizzes or play the games multiple times to achieve mastery.

The fact that the computer automatically provides the feedback also benefits the professor in that it reduces the professor's grading burden.<sup>382</sup> Particularly in larger classes, the reduced burden allows professors to incorporate assessment measures throughout the class. This benefits students in two ways. First, students receive frequent feedback.<sup>383</sup> Second, the frequent assessments force students to keep up with the work in the course.<sup>384</sup>

Interestingly, some studies have shown that students who learn material using CAI learn the material faster than they would with conventional instruction.<sup>385</sup> An active learning process, drill-and-practice exercises, tutorials, and games force students to engage with the information rather than simply sit in class listening to their professors and peers speak. Therefore, students are more likely to pay attention.<sup>386</sup> Moreover, the ability to repeat the material and the step-by-step approach of CAI makes it more likely that students will retain the information.<sup>387</sup>

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<sup>378</sup> See Geist, *supra* note 318, at 153-54; Newman, *supra* note 135, at 200. The professor can then adapt the lectures to correspond with the level of student understanding. See Geist, *supra* note 318, at 153-54; Sergienko, *supra* note 85, at 485.

<sup>379</sup> See *supra* notes 149-151 and accompanying text (asserting that digital natives expect immediate evaluations and instant results).

<sup>380</sup> See Ward, *supra* note 359, at 18.

<sup>381</sup> See *id.*; Warner, *supra* note 262, at 127. Computerized tutorials are "patient drill master[s]" because they allow students to complete the tutorial numerous times in an effort to master the material. Warner, *supra* note 262, at 127.

<sup>382</sup> See JACOBS AND CHASE, *supra* note 83, at 51-52.

<sup>383</sup> Sergienko, *supra* note 85, at 486; see *supra* notes 108-112 and accompanying text (discussing feedback).

<sup>384</sup> Sergienko, *supra* note 85, at 486.

<sup>385</sup> See Geist, *supra* note 318, at 153-54; McGaugh, *supra* note 147, at 136 (noting "[a] simple computer program that requires students to interact with the information by answering simple questions or completing exercises will help keep their attention so they can absorb the information in the reading").

<sup>386</sup> See Geist, *supra* note 318, at 153-54.

<sup>387</sup> See *id.*

## VI. CONCLUSION

Law schools in the United States are in turmoil. Legal education is subject to tremendous pressure on many fronts. The economic downturn has led to fewer jobs while simultaneously tuition and student debt are rising.<sup>388</sup> In addition, the number of law school applications has decreased significantly<sup>389</sup> and complaints that those attending law school are not receiving the instruction they need to succeed in the legal market are increasing.

In the midst of this turmoil, law schools should at the very least strive to enhance law students' educational experience. Recognizing that "[l]aw schools and lawyers will find [their] lives breathtakingly transformed by technological change"<sup>390</sup> and that "assessment puts students at the center of . . . education,"<sup>391</sup> legal educators should strive to use technology to incorporate multiple assessment opportunities into the law school curriculum. In addition to improving the educational experience, using technology to assess student learning at the course level will also teach the students the skills that they need to practice law today. Finally, an increase in assessment may even help to build back the public's trust in the wake of the current turmoil, because "[a]n institution's genuine commitment to assessment is a clear public statement of its desire to offer quality programs and improve student learning and development."<sup>392</sup>

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<sup>388</sup> See Brian Tamanaha, *FAILING LAW SCHOOLS* ch. 9 (forthcoming 2012) (addressing the rise in tuition rates, the resulting increase in student debt, and the high percentage of law school graduates who do not obtain jobs as lawyers).

<sup>389</sup> See *id.* at ch. 13 (discussing decrease in law school applicants and ramifications for law schools).

<sup>390</sup> Jeremy Paul, *The Evolution of the American Law School: Reforms Shaped by Economic Shifts, Technology Changes and Globalization*, *CONNECTICUT LAW TRIBUNE*, Jan. 2, 2012.

<sup>391</sup> See PALOMBA & BANTA, *supra* note 39, at 18.

<sup>392</sup> *Id.*