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Cristen W. Dutcher

Kennesaw State University, cdutcher@kennesaw.edu

Sonia J. Toson

Kennesaw State University

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Students' Perceptions of Adaptive Textbook Technology as a Learning Tool in Legal Studies Courses

Sonia Toson and Cristen W. Dutcher

Kennesaw State University, USA

Abstract. This article attempts to further the literature on technology in the classroom by performing an initial investigation on an innovative new textbook technology in an undergraduate legal studies course, such as the Legal Environment of Business. First, we discuss the traditional methods of teaching the law at both the law school and undergraduate levels. We also review the history and effectiveness of using technology in law school and legal studies classrooms. Next, we look the use of textbooks in legal education. Then, we introduce an adaptive and interactive textbook technology and compare it to other electronic texts in the current higher education market. Finally, we present and analyze focus group data regarding our students' perceptions of adaptive and interactive textbook technology, and conclude with our recommendations for this technology's use in the undergraduate legal studies classroom.

Keywords: educational technology, adaptive learning, legal studies, adaptive textbook and online learning.

1. Introduction

As students grow in their personal use of electronic technology, post-secondary education shows a "clear trend" toward adding more technology in the classroom.¹ Electronic textbook technology has been edging its way into post-secondary education classrooms over the past 40 years.² This increase in e-learning is due to faculty needs to contend with reduced resources, increased costs, student demand for technology, and the increasing recognition of the benefits of electronic learning tools.³

In 2009, a new electronic textbook was introduced to the higher education market, which includes both interaction and adaptation capabilities.⁴ Our interest in this new technology is in increasing student engagement with the text and

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1. National Center for Education Statistics, *Distance Education at Degree Granting Post-Secondary Institutions: 2006-2007*, <https://nces.ed.gov/pubs2009/2009044.pdf> (last visited Oct. 9, 2015).
 2. Alan Kay, *Dynabooks: Past, Present, and Future*. 70 Lib.Quart. 385 (Jul. 1, 2000).
 3. Rita Shackel, *Beyond the Whiteboard: E-Learning in the Law Curriculum*, 12 QUTLJJ 105 (2011).

student mastery of legal studies material. Much literature has been written on the use of electronic learning tools at many levels of legal post-secondary education.⁵ However, there is little research on adaptive textbooks for legal education courses. This paper introduces adaptive electronic textbooks and shares how they are positively perceived by our students. The paper concludes by giving our recommendations for the use of this technology in an undergraduate legal studies classroom.

2. History of Technology-Enhanced Education

By definition, technology-enhanced learning (“TEL”) leverages technology to maximize learning within sound course design, offers students options in terms of time, place and pace of learning and emphasizes different learning styles.⁶ A review of the literature reveals that technology-enhanced learning developed over three generations: cognitive and behaviorist, social constructivist and connectivist.⁷

The first generation of technology-enhanced learning saw its rise in the latter part of the 20th century.⁸ Referred to as the cognitivist/behaviorist era, this generation of technology-enhanced learning consisted largely of learning through postal correspondence. While teleconferencing was likely the most successful form of TEL available at the time, it was not widely used due to the associated cost and complexity when used in an educational setting. The result was wider use of postal correspondence. Postal correspondence, however, tended to be slow, expensive and not very conducive to interactivity in the learning process.⁹ This gave rise to the next era of technology-enhanced learning, the social constructivist

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4. McGraw-Hill Education, *LearnSmart Advantage*, <http://www.learnsmartadvantage.com/about> (last visited Oct. 9, 2015).
 5. Linda A. Reid & Curt M. Weber, *Using Technology-Enabled Active Learning Tools to Introduce Business Ethics Topics in Business Law Courses: A Few Practical Examples*, 25 J. Legal Stud. Educ. 283 (2008) (ethics taught in undergraduate business law course through the use of technology); Ida M. Jones, *Can You See Me Now? Defining Teaching Presence in the Online Classroom through Building a Learning Community*, 28 J. Legal Stud. Educ. 67 (2011) (examples of technology being used in online undergraduate and graduate legal environment of business courses); Shackel, *supra* note 3 (asserting that law school use of technology must be adopted cautiously and integrated with traditional instruction); Marcia L. McCormick, *From Podcasts to Treasure Hunts - Using Technology to Promote Student Engagement*, 58 St. Louis Univ. L.J. 127 (2013) (suggesting that use of technology given very positive student feedback in law school classroom).
 6. Trentin, G. (2010), *Networked Collaborative Learning: Social and Active Learning*, 1st ed., Witney, Oxfordshire: Chandos Publishing, pp. 1-18.
 7. Anderson, T. & Dron, J. (2012), “Learning Technology Through Three Generations of Technology Enhanced Distance Education Pedagogy”, *European Journal of Open, Distance and E-Learning*, 2, pp. 1-14.
 8. Anderson, T. & Dron, J. (2011), “Three Generations of Distance Education Pedagogy”, *International Review of Research in Open and Distance Learning*, 12(3), pp. 80-97.
 9. *Id.* at 83.

generation. Largely based on the work of Vygotsky and Dewey, the social constructivist generation was marked by the use of two-way communication technologies. In this era, rather than a one-way transmission of information from student to instructor and vice versa, opportunities became available for both synchronous and asynchronous interaction between students and instructors.¹⁰ In this era, learning took place largely via mass media such as television, radio, film and later the web.¹¹ The third generation of technology-enhanced learning, connectivism, emphasizes this concept of participant interaction from the social constructivist era, and builds on it using text, video, web and immersive conferencing technologies.¹² The most recent iterations of the connectivist era involve use of blogs, social media posts and multimedia webcasts.¹³ We have now reached the fourth generation and the beginning of the fifth generation of technology-enhanced learning, which involves “intelligent databases” and “intelligent flexible learning.”¹⁴ The fourth generation focuses on intelligent databases, which are marked by more collaborative and interactive use of the internet through the use of Web 2.0 and semantic web technologies.¹⁵ The fifth generation is merely a variation on the fourth generation. The fifth generation features intelligent flexible learning, which uses these intelligent databases in an asynchronous manner to provide both flexibility and efficiency to students.¹⁶ The fifth generation also often includes interaction with other campus systems and institutional processes.¹⁷

Adaptive learning technology sits squarely in the fifth generation of distance education and may even signal the dawn of the sixth generation. Adaptive learning technology uses artificial intelligence to methodically tailor the content to the student-user’s individual needs.¹⁸ Adaptive learning technology can be considered an intelligent database in that it features an interactive digital content as well as automated learning tools that adapt to the individual student-user. In addition, adaptive learning technology is typically asynchronous and often integrates with other campus systems such as the university learning management

10. *Id.* at 84.

11. Anderson, T. & Dron, J. (2012), “Learning Technology Through Three Generations of Technology Enhanced Distance Education Pedagogy”, *European Journal of Open, Distance and E-Learning*, 2, pp. 1-2.

12. *Id.* at 2.

13. Anderson, T. & Dron, J. (2011), “Three Generations of Distance Education Pedagogy”, *International Review of Research in Open and Distance Learning*, 12(3), pp. 80-97.

14. Anderson, T. & Dron, J. (2012), “Learning Technology Through Three Generations of Technology Enhanced Distance Education Pedagogy”, *European Journal of Open, Distance and E-Learning*, 2, pp. 1-2.

15. Anderson, T. & Dron, J. (2011), “Three Generations of Distance Education Pedagogy”, *International Review of Research in Open and Distance Learning*, 12(3), pp. 80-97.

16. Taylor, S. (2001), “Fifth Generation Distance Education”, *Instructional Science and Technology*, 4(1), pp. 1-14.

17. *Id.* at 2.

18. Paramythis, A. & Loidl-Reisinger, S. (2004), “Adaptive Learning Environments and e-Learning Standards”, *Electronic Journal on e-Learning*, 2(1), pp. 181-194.

system and other campus web-based services. In reviewing the overall timeline of distance education, it is clear that adaptive learning technology is a product of the fifth generation of distance learning, however a strong case can be made that it actually signals the beginning of the sixth generation of distance education. Unlike prior generations of distance education, adaptive learning technology is the first instance of education technology progressing beyond student to student and student to instructor interaction. With adaptive learning technology, we see actual interaction between the student and the content itself.

3. Traditional Methods of Teaching Law

Legal education has a long and rich history in the United States dating back to 1878.¹⁹ At that time, those who studied law did so for the sole purpose of becoming practicing attorneys. In the first hundred or so years after the Revolutionary War, most attorneys received their legal education either through self-study, an apprenticeship system or some combination of the two.²⁰ Self-study essentially amounted to an in-depth reading of the law. The apprenticeship portion of legal education varied from general observation of courtrooms to the handling of minor legal tasks under the direction of an experienced attorney.²¹ Though the self-study/apprentice system produced a great many noteworthy legal scholars, it was still flawed in nature. The most significant flaw was that there was little predictability in the level or quality of an attorney's legal education. The training of some attorneys was more heavily consumed with reading the work of prominent legal scholars (more self-study focused) while the training of others concentrated more substantially on courtroom observation and hands-on informal practice of the law (more practice-focused). As such, the legal system in the early nineteenth century lacked consistency.²²

This led to the rise of the "law school" as we now know it. Toward the end of the nineteenth century, a number of attorneys began to voice discontent at the lack of standards and professionalism among newly trained lawyers. Advocating for a new model of legal education, this group of attorneys recommended that law students attend law school for at least three years.²³ During this era of legal education content was delivered almost exclusively using a basic lecture-textbook method. Students completed assigned readings in casebooks and professors

19. Katcher, S., *Legal Training in the United States: A Brief History*, 24 *Wisc. Int'l. L. J.* 336 (2006).

20. Leo P. Martinez, *Legal Education in a Modern World: Evolution at Work*, 9 *Charleston L. Rev.* 267, 269 (2015); see also Erwin N. Griswold, *Legal Education: 1878-1978*, 64 *ABA J.* 1051 (1978).

21. Martinez, *supra* note 6 at 270.

22. *Id.* at 272 (stating that "Questions of competence were not even addressed in any significant way...[and] as a result, self-taught lawyers fared worse in general and few achieved a level of competencies necessary to adequately serve their clients' needs.")

23. *Id.* at 105.

lectured on principles of the law. This method has been described as “passive [listening] to lectures, reading textbooks that explained the rules of cases and memorization of cases presented... [with] little or no interaction with the teacher.”²⁴

From this point, legal education progressed to the Langellian method, more popularly known as the Socratic Method. The Socratic Method is named for the Greek philosopher Socrates, who believed that it is the role of the teacher to help students see weaknesses in their ideas and in exposing these weaknesses, guide them in generating new ideas.²⁵ This method began to be heavily used in the 1870s, largely under the leadership of Christopher Langdell. Langdell introduced the method at Harvard Law School and described the method as “...the shortest and best, if not the only way of mastering [legal] doctrine.”²⁶ The Socratic Method involves presentation of an appellate case followed by detailed and often severe questions posed to students regarding the case. The Socratic method combined the best of both worlds in that it provided consistency in the content provided, but unlike the lecture-textbook method that preceded it, it involved a great deal of interaction between the instructor and student. The Socratic Method moved legal education from a passive learning to an active learning environment. Because of this ideal mix of consistency in content and quality interaction with and guidance of students, the Socratic Method has remained one of the most popular methods of delivering legal education in the United States.

At the same time, legal education was developing at the law school level, it began to develop at the undergraduate level in business and accounting programs across the United States. Early on in the history of business education, the study of law was recognized as critical to a sound business education.²⁷ Legal studies continued to grow in importance to business education with the publication of two major studies in 1959, both of which emphasized the importance of the study of business law at the undergraduate level.²⁸

4. The Use of Textbooks in Legal Education

Throughout the evolution of legal education whether at the undergraduate or graduate level, the textbook has been the primary tool used for teaching the law.

24. Cynthia G. Hawkins-Leon, *The Socratic Method-Problem Method Dichotomy: The Debate Over Teaching Method Continues*, 1998 BYU Educ. & L.J. 1, 4 (1998), available at: <http://digitalcommons.law.byu.edu/elj/vol1998/iss1/2>

25. Matt Hlinak, *The Socratic Method 2.0*, 31 J. Legal Stud. Educ. 1, 2-3 (2014).

26. Hawkins-Leon, *supra* note 17.

27. George S. Siedel, *et al.*, *An Executive Appraisal of the Importance of Business Law*, 22 Am. Bus. L.J. 249, 263 (1984), (stating that law was one of the five areas of study required to be included in the first American business school in 1881).

28. George S. Siedel, *Six Forces and the Legal Environment of Business: The Relative Value of Business Law among Business School Core Courses*, 37 Am. Bus. L.J. 717, 729-731 (2000).

At the law school level, the specific type of textbook used is the casebook, which is a collection of appellate cases, background information and summaries illustrating various rules and principles of law.²⁹ At the undergraduate level, students of legal education use textbooks containing more basic summaries of rules and principles of law supplemented by appellate cases that are significantly truncated in an effort to zero in on the specific rule of law being taught in that particular chapter. Undergraduate legal studies textbooks offer graphics, discussion questions, concept summaries and ethical scenarios as opposed to chapters that contain only appellate cases, summaries and questions.

While the content is different depending on law school or undergraduate legal education, some form of textbook has for many years been the backbone of legal studies pedagogy. The textbooks used for legal education have recently progressed to become more digitized in nature. Though this paper focuses on undergraduate legal education, it bears noting that even at the law school level electronic casebooks are becoming increasingly available.³⁰ The trend toward electronic textbooks in legal education courses both at the undergraduate and graduate level has been driven by the increasing trend in undergraduate textbooks to become more digital and more interactive in their features and content.

This trend has occurred due to some noted disadvantages of traditional hard copy textbooks. Hard copy textbooks are not ideal for several reasons. First, they have a physical cost in that they are weighty and must be physically carried to class and to study. Secondly, they have a financial cost in that it is expensive to print books, which contributes to the increased price students must pay for them. The price of textbooks has increased 812% from 1978-2012.³¹ The most recent data from the National Association for College Stores reveals that in Fall 2014, students spent an average of \$323, on average \$77 per course per semester on required course materials.³² This high cost often leads student to choose not to purchase textbooks because they are too expensive.³³ Finally, hard copy textbooks have an environmental cost. Hard copy textbooks are generally less sustainable than electronic options.³⁴ Electronic options do not require paper, glue, manufacturing processes or shipping, all of which leave a sizeable carbon

29. Joseph Scott Miller & Lydia Pallas Loren, *The Idea of the Casebook: Pedagogy, Prestige, and Trusty Platforms*, 11 Wash. J.L. Tech. & Arts 31, 38 (2015). See also Ronald W. Staudt, *Legal Education I: An Essay on Electronic Casebooks: My Pursuit of the Paperless Chase*, 68 Chi.-Kent L. Rev. 291 (1992).

30. *Id.*

31. David Kim & Jeffrey Pomerantz, "Smart Libraries Will Power the Transition to Personalized Learning", *edSurge*, Sep. 22, 2015, <https://www.edsurge.com/news/2015-09-22-smart-libraries-will-power-the-transition-to-personalized-learning> (last visited Oct. 19, 2015).

32. National Association of College Stores, *Higher Education Market Retail Facts and Figures*. <https://www.nacs.org/research/industrystatistics/higheredfactsfigures.aspx> (last visited June 17, 2016).

33. The Federation of State Public Interest Research Groups, *Report: Affordable Higher Education, Fixing the Broken Textbook Market*, Jan. 27, 2014, <http://www.uspirg.org/reports/usp/fixing-broken-textbook-market> (last visited Oct 19, 2015), stating that 65% of students said that they had decided against buying a textbook because it was too expensive.

footprint.³⁵ Furthermore, while hard copy textbooks deliver a great deal of content, they do not interface or interact with the student in the way that an electronic textbook can.

These disadvantages have contributed to the increasing popularity of electronic textbooks.³⁶ Often referred to as “e-books” “e-textbooks” or “e-texts”, these books range from simple electronic versions of the traditional hard copy textbook, usually in pdf format and usually available via online delivery, to more sophisticated interactive texts featuring dynamic content.

Legal studies curricula have followed this trend in some respects, but in general, legal education is seen as traditionally slow to adopt new learning technologies.³⁷ This is largely due to certain restrictions instituted by the American Bar Association (“ABA”), specifically the mandate that law school required regular and punctual class attendance. This according to the ABA’s accreditation standards, required that, as a condition of graduation, students must complete 58,000 minutes of instruction time, with at least 45,000 of those minutes being earned by attending classes at the law school.³⁸ This requirement was perceived as prohibiting any form of online education.

Additionally, it was a challenge for law schools to integrate e-learning tools with traditional instruction methods.³⁹ However, in 1995, we begin to see some critical research demonstrating the effectiveness of incorporating at least some technology into courses at the undergraduate and graduate levels in a variety of non-legal disciplines. This research did not go unnoticed by the legal academy and as a result, the first online and technology-enhanced legal studies courses were introduced in 1995,⁴⁰ followed by the first fully online law school in 1998.⁴¹ By the mid-2000’s, there were several fully-online LL.M. programs.⁴² By 2010, most accredited law schools offered at least some content online.

34. Thomas F. Gattiker & Scott E. Lowe, *Can E-Books Help Save the Planet? It Depends on You*, Chronicle of Higher Educ., Oct. 1, 2012 at 2, 4 <http://chronicle.com/article/Can-E-Textbooks-Help-Save-the/134680/> (last visited Oct. 19, 2015).

35. Joe Hutsko, *Are e-Readers Greener Than Books?*, N.Y. Times, Aug. 31, 2009 http://green.blogs.nytimes.com/2009/08/31/are-e-readers-greener-than-books/?_r=0 (last visited Oct. 19, 2015).

36. Reynol Junco & Candrianna Clem, *Predicting Course Outcomes with Digital Textbook Usage Data*, 27 Internet & Higher Educ. 54, 55 (2015).

37. John Goldring, *Coping with the Virtual Campus: Some Hints and Opportunities for Legal Education?* 6 Legal Educ. Rev. 91 (1995).

38. Gerald F. Hess, *Blended Courses in Law School: The Best of Online and Face-to-Face Learning?*, 45 McGeorge Law Review, 51, 53.

39. Shackel, *supra* note 3.

40. *Id.*

41. Though it is interesting to note that this school was never accredited by the ABA. This is likely due to the aforementioned restrictions imposed on classroom attendance. See Robert E. Oliphant, *Will Internet Driven Concord University Law School Revolutionize Traditional Law School Teaching?*, 27 Wm. Mitchell L. Rev. 841 (2000).

42. LL.M. refers to the Master of Laws degree. See Gerald F. Hess, *Blended Courses in Law School: The Best of Online and Face-to-Face Learning?*, 45 McGeorge Law Review, 51, 53.

At this point in the history of legal education, there is overwhelming recognition that technology use in law school classrooms will better prepare law students for contemporary legal practice.⁴³ As such, in the post-secondary legal studies classroom, technology is used in many ways, including online readings, audio resources, video resources and the internet.⁴⁴

Researchers have found positive relationships between students' perceived effectiveness of computer technology use in a course and their overall perceived effectiveness of a course generally,⁴⁵ and specifically at the law school level.⁴⁶ Additionally, in the undergraduate legal studies classroom both students' perceived effectiveness and actual effectiveness of technology use in the classroom were shown.⁴⁷

5. Adaptive Textbook Technology

A primary example of adaptive learning technology is adaptive textbook technology. There is currently no literature on adaptive textbook technology for higher education students outside of the discussion of adaptation as a tool to aid students with disabilities, creating a gap in the pedagogy of legal studies literature.⁴⁸ However, as a newly available tool that may help students study more effectively, increase learning, and improve knowledge acquisition and retention, the adaptive textbook should be investigated further. Our initial question regarding adaptive textbook technology involves student perception of its use in comparison to the type of textbook that the students are accustomed to using, either print text or static electronic text. To determine said perceptions, the authors surveyed undergraduate business law students at two 4-year public institutions. Our research question was as follows:

How do students perceive adaptive textbook technology in comparison with traditional print textbooks in an undergraduate legal studies class?

We began by investigating current adaptive technology textbooks available on the market. An extensive search revealed that there are very few digital textbooks that offer more than a static textbook available in an electronic format. Currently textbook options available to students fall into one of four categories:

43. Gary A. Munneke, *Managing a Law Practice: What You Need to Learn in Law School*, 30 Pace Law Rev. 1207 (2010).

44. Jones, *supra* note 5.

45. Gretchen Lowerison, *et al.*, *Are We Using Technology for Learning?* 34 J. Educ. Tech. Systems 401 (2006).

46. McCormick, *supra* note 5.

47. Jones, *supra* note 5.

48. S.G. Rantti Junus & Char Booth, *E-books and E-readers for Users with Print Disabilities*, 48 Lib. Tech. Rpts. 22 (2012).

traditional hard copy textbooks, static electronic textbooks, interactive textbooks and adaptive textbooks.

Traditional print textbooks are widely available in the current textbook market. This form of textbook is typically more expensive than an electronic textbook due to the manufacturing costs. This category of textbook is most available in the current market. The next most available textbook format is the static electronic textbook. This category of textbooks contains virtually the same content as the traditional hard copy textbooks; however, the content has been digitized and is available electronically. The digitized format is often a basic pdf that is static in that it cannot be manipulated or altered by the student in any way. The next category currently available on the market is interactive textbooks. These books are typically web-based and contain varying types of interactive features ranging from ability to highlight and take notes, to dynamic multimedia content and direct links to additional resources.

Interactive books, however, are not nearly as common in the market as print and static electronic textbooks. Of the interactive texts that are available, most are geared toward K-12 classrooms. Very few interactive textbooks have been developed for post-secondary use, although this is changing increasingly.

5.1. K-12

For example, the authors reviewed a popular text designed for K-8 science classes. The text is an online workbook that is interactive in a variety of ways.⁴⁹ Students using this textbook have the ability to “write” in their textbooks, thus personalizing the digital experience. The textbook also includes hands-on inquiry activities designed to coincide with assigned reading. These activities are included before, during and after the reading, allowing the student to self-assess at each point along the way.⁵⁰ Labs and other materials are also accessed online. While this text is interactive in that it allows students to engage with the product in an online environment, it cannot be considered adaptive. Unlike an adaptive text, readings and study materials are not adapted to the specific student based on their performance and assessment. Furthermore, products of this type are typically only available to K-8 and occasionally K-12 students. There is no equivalent product at the post-secondary level offered by this publisher.

49. Pearson Instructional Resources, *Interactive Science: A Science Curriculum by Pearson*, <http://www.pearsonschool.com/index.cfm?locator=PSZtSj&PMDBSOLUTIONID=6724&PMDBSITEID=2781&PMDBCATEGORYID=814&PMDBSUBSOLUTIONID=&PMDBSUBJECTAREAID=&PMDBSUBCATEGORYID=&PMDBProgramID=67681> (last visited Sept. 23, 2015).

50. *Id.*

5.2. Post-Secondary

At the post-secondary level, there are even fewer interactive texts. Most interactive textbooks fall into two categories. The first consists of textbooks designed by authors and written to be interactive. One such text, used to teach computer science students the programming language Python, provides a demonstrative example of interactive textbooks currently available to undergraduate students.⁵¹ This text teaches students to code by allowing them to experiment with active code examples embedded directly in the text, providing student-to-context interactivity. Students actively learn the content by actually practicing coding while they read.⁵²

Similarly to the K-12 texts previously discussed, students complete their assignments directly in the textbook environment and answer interactive questions to help them self-assess their understanding of the material. They are also provided with various multimedia resources, such as audio tours and short videos to assist them in understanding and retaining difficult concepts.⁵³ Unlike K-12 texts, however, this text is designed for college-level students or computer science practitioners. In this more mature learning environment, students are able to interact with other learners to discuss assignments, giving it another dimension of interactivity. It should be noted however, that this text also does not adapt to the individual student reading it, based on performance or assessment data.

The second category of interactive textbooks currently available includes those stemming from strategic partnerships between publishers and technology companies. These partnerships seek to offer traditional print textbooks through the use of a digital, interactive platform. The most prevalent example of this type of textbook is iBooks Textbooks. iBooks Textbooks is a partnership between Apple and various textbook publishers to offer textbooks to students via an iPad or iPhone.⁵⁴ iBooks Textbooks attempt to reinvent the traditional static textbook by transforming the publisher's content into an interactive, student-friendly medium. The interactive features of iBooks Textbooks include interactive diagrams, photos and videos contained directly in the textbook containing interactive captions, 3D rotation and cross-references to chapter content.⁵⁵

In addition to interactive reading features, these textbooks also contain interactive study elements. Students are able to highlight, underline and take notes while reading the content.⁵⁶ Highlights and notes taken by the student

51. Brad Miller and David Ranum, *How to Think Like a Computer Scientist: Learning with Python - Interactive Edition 2.0*, <http://interactivepython.org/courselib/static/thinkcspy/index.html> (last visited Sept. 23, 2015).

52. *Id.* at 3.

53. *Id.* at 3.

54. Apple in Education, *iBooks Textbooks for iPad*, <http://www.apple.com/education/ipad/ibooks-textbooks/> (last visited Sept. 25, 2015).

55. *Id.*

56. *Id.*

automatically appear as study cards. Students can also interact with classmates by sharing information directly from the text via social media.⁵⁷ The iBooks method of textbook technology is somewhat more adaptive than the previously mentioned textbook options because it does adapt to the student by creating customized study tools based on the individual student's highlights and notes. There is however, no assessment feature to allow the student to gauge whether they are highlighting and taking notes effectively.

At the law school level, interactive and adaptive texts are extremely rare. This is due to the aforementioned traditionalist theories about the methods that should be used to teach law. Not surprisingly, there are no adaptive textbooks currently available at the law school level. There is, however, one interactive textbook currently available to law school students. The text is a variation of the traditional casebooks used to teach law students legal principles and rules of law. Referred to by the publisher as an "interactive casebook", this type of text is the least interactive of the textbooks currently available on the market. Interactive casebooks are traditional hard copy textbooks that are accompanied by an electronic companion. The online version is interactive in that it contains a visual display typically not used in legal case books. The visual display includes text boxes, diagrams, multimedia and color-segregated feature sections for critical thinking exercises, such as hypotheticals and case problems.⁵⁸ The text also utilizes extensive hyperlinking to additional resources, pictures and video, case law and cross-references to previous or subsequent chapter content.⁵⁹ Despite the fact that these features are fairly common in undergraduate and even graduate textbooks, they are unique and considered innovative at the law school level.⁶⁰

The final category of available textbooks is adaptive textbooks. The next phase in the evolution of legal studies textbooks advances them from student-to-textbook interaction to textbook-to-student interaction. In other words, content is now being tailored to the individual students' needs for the specific course in which the textbook is used. This type of textbook is therefore referred to as "adaptive." Note that adaptive textbooks differ from interactive textbooks in some significant ways. While interactive textbooks allow the student to interact with others (i.e. other students and the instructor) and with the content, (i.e. the text, the learning management system, multimedia tools, additional resources, etc.), the interaction is unidirectional. Interactive textbooks do not allow communication to flow back to the student. Thus, the interactivity is not reciprocal. Adaptive textbooks are unique, as the content is customized to the

57. *Id.*

58. *Id.*

59. *Id.*

60. West Academic, *The Benefits of the Interactive Casebook's Online Version*, <https://www.youtube.com/watch?v=RRyKU6kFmN4>, (stating that the Interactive Casebook Series is the future and gives students exercise in where the practice of law will be in the future, which is online and not in print.) (last visited Sept. 28, 2015).

reader's needs based on real-time feedback related to the student's actual and perceived learning of the content.

The research in this article focuses on adaptive textbook technology currently available to legal studies students. The authors found only one example of adaptive textbook technology available in the legal studies discipline. Adaptive textbooks brand themselves as more of an interactive study tool rather than a textbook in the traditional sense. Adaptive textbook technology is designed to not only deliver content, but also to assess a student's knowledge and comprehension of that content. Based on this assessment, adaptive textbook technology provides real-time feedback regarding the content the student has mastered as well as the specific content requiring additional study. Assessment data is then used to tailor the content to the student's specific needs. The content, therefore, becomes unique to the student and his or her individual requirements.

While adaptive textbooks are designed to help students read and study more efficiently, this type of technology has not been studied in a legal studies classroom and therefore has been not proven to be effective or even desired by students and faculty. A review of the literature indicates that adaptive textbook technology has proven effective in certain disciplines; however, research has not been conducted on its use in the legal studies classroom.⁶¹ As a first step in a series of research on adaptive textbook technology in the legal studies classroom, the authors undertook a study of students' perception of this type of technology in order to gauge their willingness to use it. Thus, the goal of research that is the focus of this paper was to investigate students' perceptions of adaptive textbook technology when compared with traditional print textbooks.

6. Student Perception of Adaptive Textbook Technology

6.1. Methodology

In the fall semester of 2014, two eighty-five student undergraduate Legal Environment of Business classes at Kennesaw State University and one forty student undergraduate Legal Environment of Business class at Southern Polytechnic State University participated in a presentation describing adaptive textbook technology. The specific example of LearnSmart, created by McGraw-Hill, was used to demonstrate adaptive textbook technology. Each presentation included a fifteen to twenty minute demonstration of adaptive textbook technology and a fifteen to twenty minute question and answer session. At the end of the presentation a ten question survey was distributed to participants.

61. McGraw-Hill Higher Education, "McGraw-Hill LearnSmart Effectiveness Study", <http://createwp.customer.mheducation.com/wordpress-mu/connectblog/files/2011/05/McGraw-Hill-LearnSmart-Effectiveness-Study-May-2011.pdf> (last visited June 24, 2016)

Completion of the survey was conducted on a voluntary basis and each participant was instructed that participation in the survey was optional and not required. The survey yielded ninety one responses from Kennesaw State University and twenty three responses from Southern Polytechnic State University resulting in a sample size of one hundred fourteen responses.

6.2. Data Collection

The survey included the option for students to include personal information such as name, email address, and school name for use by the publisher in marketing materials. Some students chose to include this personal information and others did not, thus the survey was not anonymous. Before completing the survey, participants were required to first read and sign a consent agreement, which they were allowed to keep. The student perception survey questions analyzed in this paper used a Yes/No question that included an optional open comment and a five point Likert scale question. These questions asked the students if they would prefer the adaptive textbook over traditional texts, why or why not, and how likely they were to use the adaptive textbook technology if it was offered to them in class. The survey is included as Exhibit A to this article.

6.3. Results

The data consists of ninety-one completed surveys from undergraduate legal studies students at Kennesaw State University and twenty-three completed surveys from undergraduate legal studies students at Southern Polytechnic State University. The goal of the research was to investigate how students perceive adaptive textbook technology in an undergraduate legal studies classroom. Our question inquiring whether students had purchased an e-book before or not, Question number one, is not discussed here. Although we have data indicating whether or not students had made such a purchase, we don't know how heavily their purchased e-book was used, if at all. Thus, the mere purchase of an e-book doesn't necessarily effect their perception of an adaptive e-book, which is very different from a static e-book, as explained above.

This analysis focuses on questions five and six in the survey, as these were yes/no questions and provided participants an opportunity to comment on their perceptions of adaptive textbooks. Question number five investigated students' perception of the adaptive textbook technology by asking about a specific example of this type of textbook. The question utilized a Yes/No format and an optional open comment section. The question read: *Would you prefer LearnSmart to your traditional textbook?* Of the one hundred and fourteen completed surveys, there were eight non-responses, resulting in a sample size of one hundred and six

responses. The frequency and variable outcomes for this survey question are illustrated in Exhibit B, Table 1.

The optional open comment portion of the question prompted participants to explain their choice of yes or no. The authors developed a coding model from the text responses to the optional open comment in which a positive response corresponded to preferring the adaptive textbook and a negative response corresponded to preferring traditional textbooks. Coding yielded five types of comments. Four of these types of comments and examples of a student response to each type are listed in Exhibit B, Table 2.

The fifth type of comment was listed as “No Comment” to indicate participants who did not respond to the optional open comment prompt. The summary statistics and confidence intervals for all five comment types are in Table 3. Table 4 summarizes the analysis of responses to both the Yes/No and optional open comment portions of survey question five. About 57.9% of the students who responded “No” to a preference for adaptive textbooks in survey question five also wrote a comment of the negative type about adaptive textbooks in the open comment prompt. Additionally, about 58.6% of the students who responded “Yes” to a preference for adaptive textbooks in survey question five also wrote a comment of the positive type about adaptive textbooks in the open comment prompt. The proportional difference between these two groups of participants is not significant ($z = -0.06$, $p\text{-value} = 0.95$), which suggests consistency in participants' preference rating of and comments toward adaptive textbooks in survey question five.

The second survey question discussed in this paper's analysis is survey question number six. The question read: *How likely are you to use LearnSmart if it was available to you?* This question investigated student likeliness of adaptive textbook usage with a five-point Likert scale response scheme. The summary statistics and confidence intervals for responses to survey question six are listed in Exhibit B, Table 5.

The final statistical analysis derived was in comparing student responses to both survey questions five and six. The authors sought to ensure the responses to survey questions five and six aligned with one another in terms of positivity or negativity. Specifically, the authors sought to determine if students who responded negatively with a “No” for survey question five also responded to survey question six negatively by choosing “Extremely unlikely” to use adaptive textbook technology. The comparison is illustrated in Exhibit B, Table 6.

6.4. Limitations

The sample derived from only two post-secondary institutions that teach undergraduate legal studies courses, and only one-hundred and fourteen total participants submitted survey responses. A larger data set from multiple

institutions of higher education that teach undergraduate legal studies courses would provide a more generalizable result. Further, although rich qualitative comments were obtained from eighty-nine students, there were only two quantitative survey questions addressing student perception. Additionally, there was no demographic data gathered on the students surveyed to know if the responses were from a cross-cultural range of ages and mix of genders. Including demographic information in a larger survey of this type would ensure both genders, a mix of cultures, races, and ages are included in the data. Finally, participants were not surveyed specifically regarding the cost of the adaptive textbook versus traditional textbooks. An inquiry into whether the cost of the adaptive text affects the desirability of the product would help determine overall student perception.

6.5. Discussion

The results of this study contribute to the literature on the use of new technologies in the classroom. Specifically, this study's focus on adaptive textbook technology begins the discussion on this yet untested new tool for content delivery. The frequency and percentage survey data from Table 1 suggests, using the Clopper Pearson method,⁶² that between 73.7% and 88.2% of legal studies students would respond favorably to adaptive textbook technology. This large percentage of positive responders is encouraging to instructors of undergraduate legal studies courses, such as the Legal Environment of Business and Business Law, who wish to utilize this innovative form of textbook technology.

Additionally, the frequency and percentage survey data from Table 3 suggests that legal studies students commented positively about adaptive textbook technology between 37.2% and 55.8% of the time. Further, the study determined that well over half of legal studies students would be either somewhat likely (between 20.69% and 37.71%) or extremely likely (between 31.51% and 49.91%) to use adaptive textbooks if the technology was offered to them. Lastly, in comparing participant responses to both survey questions five and six, as noted in Exhibit B, Table 6, the authors are confident that the proportion intervals of legal studies students for each response to question six would fall by question five's responses. For example, the proportion of students that would respond "No" to survey question five and "Extremely Likely" to use LearnSmart in survey question six is only between 0% and 2.814%. Thus, legal studies faculty can feel confident that their students will be positively receptive to adaptive textbook technology.

These results can also be interpreted using the Theory of Planned Behavior (TPB). TPB explains human behavior through three determinants of intention: 1)

62. C. J. Clopper & E. S. Pearson, *The Use of Confidence or Fiducial Limits Illustrated in the Case of the Binomial*. 26 *Biometrika* 404 (1934).

a person's attitude toward an action, 2) the subjective norms around an action, and 3) a person's perceived ability to control the action.⁶³ Derived from social psychology, specifically the Theory of Reasoned Action, TPB has been widely used outside of psychology to successfully predict behavioral intention, including the usage and acceptance of new information systems technology,⁶⁴ and technology in post-secondary education.⁶⁵

Our data can be analyzed using attitude and controllability to predict behavior toward adaptive textbook technology. Attitude is defined as "an individual's positive or negative feelings (evaluative effect) about performing the targeted behavior."⁶⁶ As attitude toward an action becomes more positive, the more likely a person intends to act in that way.⁶⁷ Here, the large percentage of positive responses to Question 5 regarding preference for using adaptive textbook technology, as detailed above, predicts intention to use adaptive textbook technology. We can also find intention to use adaptive textbook technology in the controllability determinant of the TPB. Perceived ability to control an action is the "perceived ease or difficulty of performing a behavior", and a component of controllability is the opportunity a person possesses to act on a behavior.⁶⁸ Perceived control rises the more opportunities to act a person believes he or she possesses.⁶⁹ Here, in Question 6 of our survey, detailed above, an opportunity to use adaptive textbook technology is given in the form of potential availability. Participant responses show likelihood to use adaptive textbook technology if given the opportunity.

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63. Icek Ajzen, "The Theory Of Planned Behavior", 50(2) *Organizational Behavior & Human Decision Processes* 179 (1991) (a review of studies that successfully used TPB to predict intention and behavior).
64. Kieran Mathieson, *Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior*. 2(3) *Information Systems Research* 173 (1991); Shirley Taylor and Peter A. Todd, *Understanding Information Technology Usage: A Test of Competing Models* 6(4) *Information Systems Research* 144 (1995); David A. Harrison, et al., *Executive Decisions About Adoption of Information Technology in Small Business: Theory and Empirical Tests* 8(2) *Information Systems Research* 171 (1997).
65. S.G.M Koo and Sze Wan Kwong, *Using Podcasting to Enhance Learning Experience: A Case Study on Subscription Behavior*. Proceedings: *Frontiers in Education*, Paper presented at 36th Annual *Frontiers in Education Conference* 3, doi:10.1109/FIE.2006.322461 (2006) (using the Theory of Planned Behavior to analyze university student podcasting subscription behavior); Sunkanlaya Sawang, et.al, *It's not only what I think, but what they think! The moderating effect of social norms*. 76 *Computers and Education* 182 (2014) (using the Theory of Planned Behavior to analyze college students adoption of a new virtual learning system); Eddie W.L. Cheng and Samuel K.W. Chu, *The role of perceived e-collaborative performance in an extended theory of planned behavior model*. 12(4) *International Journal of e-Collaboration* 24 (2016) (using the Theory of Planned Behavior to analyze secondary and post-secondary student engagement in online collaboration).
66. M. Fishbein & I. Ajzen, *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Addison-Wesley, Reading, MA (1975) (describing the Theory of Reasoned Action, which was extended by the TPB).
67. Ajzen, *supra* note 53.
68. Ajzen, *supra* note 53.
69. Ajzen, *supra* note 53.

When viewed through the lens of the TPB, the data clearly affirms a conclusion of positive student perception of adaptive textbook technology. While it is beyond the scope of this article, future research might involve an expanded TPB analysis. Said analysis might specifically investigate the subjective norm determinant of intention in TPB, further investigate perceived control through determination of participants' knowledge of adaptive textbook technology, including resources and secondhand information available to them,⁷⁰ and even address extensions of the TPB model.⁷¹

7. Conclusions and Recommendations

Students' overall positive perceptions of adaptive textbook technology suggest it will be well received in the legal studies classroom. The authors intend to continue to investigate this topic by conducting research in a number of adaptive textbook technology-related areas. Certainly, the use of this new type of textbook technology warrants further research regarding its actual efficacy in improving study tactics, study time, and content retention. Additionally, an investigation of adaptive textbook technology's actual aide to student learning and results should also be examined. Further research should also include a survey of the demographic background of student participants and should inquire about the effect of adaptive textbook cost on desirability of such technology. Finally, an investigation of the accuracy of student self-assessment in answering confidence levels of content based answers would further advance the literature on student metacognition.

70. Ajzen, *supra* note 53.

71. Viswanath Venkatesh, *et al. User Acceptance of New Technology: Toward a Unified View* 27(3) MIS Quarterly 425 (2003).

EXHIBIT A

STUDENT PERCEPTIONS OF ADAPTIVE TEXTBOOK TECHNOLOGY SURVEY

1. Have you purchased an eBook versus a printed textbook previously for a course?

Yes

No

2. When do you read your current textbook? (Check all that apply.)

I read before class, so I can be prepared for discussions and lectures.

I read after class, to reinforce what was discussed in class.

I read right before quiz or exam to prepare.

I have not read my book.

I didn't buy the book.

3. How prepared are you to speak about the course concepts when you come to class?

I am super prepared.

I feel prepared sometimes.

I have a vague idea of what we are talking about.

I will learn what I need to learn in class.

4. What concepts do you spend your time studying before the exam?

I know exactly what I need to study and focus my time on certain topics I know I struggle with.

I study everything because I don't know where to focus my time.

I have no idea what to study and feel lost, so I don't study much.

SmartBook/LearnSmart is an adaptive reading experience that customizes your textbook based on what you need to know. Much like Pandora, SmartBook/LearnSmart constantly builds your personal reading playlist so that you can focus on the topics you need to study. Based on what was discussed in the focus group you attended, answer the following questions.

5. Would you prefer SmartBook/LearnSmart to your traditional textbook?

Yes

No

Why or why not?

6. How likely would you be to use SmartBook/LearnSmart if it was available to you?

Very likely

Somewhat likely

Neither likely or unlikely

Somewhat likely

Extremely unlikely

7-9. Optional entry of personal contact information.

10. Would you like to learn more about SmartBook/LearnSmart?

Yes

No

EXHIBIT B

TABLES

Table 1: Survey Question No. Five: “Would you prefer LearnSmart to your traditional textbook?”

	Frequency	Percent
Yes	87	82.08
No	19	17.92
<i>Total surveys N = 114</i>		
<i>Total responses, n = 106</i>		
<i>Total missing m = 8</i>		

Table 2: Survey Question No. Five “Why would you or why would you not use LearnSmart if it was offered to you?”

Category	ID	Response
Negative	KSU-S43	“I like a textbook hard copy to be able to have it in my hands.”
	SPSU-S16	“I like adaptive ability, but I prefer a physical book over an eBook.”
Neutral	KSU-S19	“Depending on the class.”
	SPSU-S19	“Maybe, it really depends on the class and teacher.”
Positive	KSU-S5	“It helps me find and focus on what I need to spend time on.”
	SPSU-S8	“I think that it is a great product that could help me prioritize, and I also fell the practice sections are highly beneficial.”
Unclassified	KSU-S17	“Infinite UI, portable because online across devices.”
	SPSU-S20	“I would prefer, but cost will be the deciding factor.”

Table 3: Survey Question No. Five Open Comment Response Statistics

Type	Frequency	Percent	Std. Err. of Percent	95% Confidence Limits of Percent
Negative	15	13.16	3.18	13.16 ± 6.30
Neutral	13	11.40	2.99	11.40 ± 5.924
No Comment	25	21.93	3.89	21.93 ± 7.71
Positive	53	46.49	4.69	46.49 ± 9.30
Unclassified	8	7.02	2.40	7.02 ± 4.76
<i>Total surveys N = 114</i>				
<i>Total responses, n = 106</i>				
<i>Total missing m = 8</i>				

Table 4: Survey Question No. Five Yes/No and Open Comments

	No			Yes			Total
	Frequency	Std. Err. of Percent	95% CI	Frequency	Std. Err. of Percent	95% CI	
Negative	11	3.00	10.34±5.90	3	1.62	2.83± 3.02	14
Neutral	3	1.62	2.83± 3.02	6	2.26	5.66 ± 4.47	9
No Comment	2	1.33	1.89 ± 2.26	22	3.96	20.75 ± 7.85	24
Positive	1	0.94	0.94 ± 1.41	51	4.88	48.11 ± 9.67	52
Unclassified	2	1.33	1.89 ± 2.26	5	2.07	4.72 ± 4.10	7
Total	19			87			106

Total surveys N = 114
Total responses, n = 106
Total missing, m=8

Table 5: Survey Question No. Six “How likely would you be to use LearnSmart if it was offered to you?”

Response	Frequency	Percent	Std. Err. of Percent	95% Confidence Limits of Percent
Extremely unlikely	19	16.81	3.53	16.18 ± 7.00
Somewhat unlikely	12	10.62	2.91	10.62 ± 5.77
Neither likely nor unlikely	3	2.65	1.52	2.65 ± 2.83
Somewhat likely	33	29.20	4.30	29.20 ± 8.51
Extremely likely	46	40.71	4.64	40.71 ± 9.20

Total surveys N = 114
Total responses, n = 113
Total missing m = 1

Table 6: Comparison of Survey Responses to Questions Five and Six

	No			Yes			Total
	Frequency	Std. Err. of Percent	95% CI	Frequency	Std. Err. of Percent	95% CI	
Extremely unlikely	4	1.86	3.78 ± 3.69	15	3.40	14.15±6.74	19
Somewhat unlikely	4	1.86	3.78 ± 3.69	7	2.42	6.60 ± 4.81	11
Neither likely nor unlikely	2	1.33	1.89 ± 2.56	1	0.94	0.94 ± 1.41	3
Somewhat likely	8	2.58	7.55 ± 5.11	20	3.82	18.87±7.57	28
Extremely likely	1	0.94	0.94 ± 1.41	44	4.81	41.51±9.53	45
Total	19			87			106

Total surveys N = 114
Total responses, n = 106
Total missing m = 8