ZOOM AS AN IN-PERSON LEARNING PLATFORM

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ABSTRACT

During the COVID-19 pandemic, an unprecedented shift to remote learning spurred many legal educators to reassess their pedagogical norms and practices. These reassessments were enabled, in part, by the widespread adoption and acceptance of videoconferencing software, most notably Zoom, that accelerated from March of 2020. Zoom's catalytic effect on pedagogy belies the fact that no single aspect of Zoom, by itself, is particularly path-breaking. What is revolutionary, however, is how Zoom bundles diverse functionalities into a coherent package.

By recasting Zoom as a bundle of classroom functionalities—as an in-person learning platform—this Article presents a novel use case for Zoom in legal education, distinct from the software's role in remote synchronous instruction. This proposed use case unsettles the conventional pandemic-era evaluative frames for Zoom and other videoconferencing applications. Instead of focusing on whether Zoom's virtual environment adequately substitutes for in-person class sessions, this Article argues that faculty can deploy Zoom directly into physical classrooms to enhance in-person teaching. And, instead of translating Zoom-enabled pedagogical practices to in-person instruction on a one-off basis, this Article focuses on Zoom's delivery of an integrated suite of teaching enhancements that instructors can deploy dynamically in physical space. In these ways, Zoom and other videoconferencing software provide leverage to shape our in-person interactions, as well as our virtual ones.

This Article situates Zoom, as an exemplar of videoconferencing software, within the conventional categories of software platforms used in education. Then, this Article discusses eight concrete implementations of Zoom's features that can enhance law school teaching outside of virtual space. Finally, this Article explores the advantages and disadvantages of using Zoom in physical classrooms, with an emphasis on the ways in which Zoom, as an in-person learning platform, refigures conventional modes of instruction.

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I. INTRODUCTION

In spring 2020, the COVID-19 pandemic forced legal education into a rapid, unprecedented shift to remote learning. As in-person classes returned, teachers of law (and their students) worked to reconcile their pandemic experiences with prior pedagogical norms and practices.[1] For many, the pandemic augured new pathways that paired virtual and physical classroom spaces.[2] Others anticipated that law schools would deploy more wholly online modalities,[3] with both positive and detrimental consequences.[4] Some heralded the ways that online environments disrupted and reconfigured

1. The shift back to in-person teaching was, of course, neither linear nor complete. *See*, *e.g.*, Richard K. Neumann Jr., *Violations During the Pandemic of Law School Faculties' Authority to Decide Methods of Instruction*, 70 J. LEGAL EDUC. 413, 414 (2021) (critiquing "simultaneous hybrid teaching" as the practice emerged in fall 2020).

2. *See* Colleen P. Graffy, *Pandemic Pedagogy and Its Applications for International Legal Education and the HyFlex Classroom of the Future*, S. ILL. UNIV. L.J. 45, 48 (2021) (merging online and in-person instruction could "create something new and dynamic"); Agnieszka McPeak, *Adaptable Design: Building Multi-Modal Content for Flexible Law School Teaching*, 65 ST. LOUIS UNIV. L.J 561, 564 (2021) (introducing "adaptable design" as a means to accommodate a continuum of instructional modalities); Anita M. Singh, *From Crisis Springs Opportunity: Using Virtual Learning to Develop More Effective Lawyers*, 65 ST. LOUIS UNIV. L.J. 663, 665 (2021) (arguing that online instruction develops students' "virtual intelligence"); David I.C. Thomson, *Elements of Effective Online Instruction in Law*, 65 ST. LOUIS. UNIV. L.J. 703, 704–07, 709–10 (2021) (claiming that optimal course design should leverage multiple modalities to meet learning outcomes). For pandemic-era case studies involving hybrid-flexible modalities outside of legal education, *see* Ben Andera, *A Pandemic HyFlex Story at Central Michigan University*, *in* HYBRID-FLEXIBLE COURSE DESIGN 3.17 (Brian J. Beatty ed., 2019) (ebook) (collecting stakeholder perspectives on challenges and opportunities presented by hybrid-flexible teaching); Ben Harley & Danette Long, *Evolving HyFlex from Emergency Measure to Sustainable Program: Northern State University*, *in* HYBRID-FLEXIBLE COURSE DESIGN 3.14 (Brian J. Beatty ed., 2019) (ebook) (outlining implementation strategies for hybrid-flexible instruction to meet student and faculty needs).

3. *See generally* LAW TEACHING STRATEGIES FOR A NEW ERA: BEYOND THE PHYSICAL CLASSROOM (Tessa L. Dysart & Tracy L.M. Norton eds., 2021). *See also* A. Michael Froomkin, *The Virtual Law School, 2.0*, 70 J. LEGAL EDUC. 348, 374 (2021) ("The enforced turn to teaching online in turn revived speculation that maybe law teaching would be better, or at least cheaper, if conducted without the encumbrance of a physical law school."); Thomson, *supra* note 2, at 704 ("The debate about whether we should teach law online is over."). For pandemic-informed perspectives on distance learning in higher education, *see generally* UCL PRESS, ONLINE AND DISTANCE EDUCATION FOR A CONNECTED WORLD (Linda Amrane-Cooper et al., eds., 2023) (ebook).

4. *Compare* William S. Blatt, *The Power of Presence in Socratic Teaching: The Effect of Substituting Videoconferencing for In-Person Classes*, 70 J. LEGAL EDUC. 284, 287 (2021) (footnote call number omitted) (arguing that remote modalities "tend to undermine physical, mental, and social presence, and accordingly, cognitive and social skills"), *and* Joseph A. Schremmer, *Join with Me, Won't You? Civic Engagement, COVID-19, and the Millennial Generation of Law Professors*, 69 J. LEGAL EDUC. 689, 696 (2020) ("[O]nline interactions may not necessarily foster civic skills—public speaking and debate, for example—as effectively as in-person interactions."), *with* Yvonne M. Dutton & Seema Mohapatra, *COVID-19 and Law Teaching: Guidance on Developing an Asynchronous Online Course for Law Students*, 65 ST. LOUIS UNIV. L.J. 471, 477 (2021) (noting that "online classes can enhance student engagement and learning"), *and* Nina A. Kohn, *Teaching Law Online: A Guide for Faculty*, 70 J. LEGAL EDUC. 230, 231–32 (2021) (discussing advantages of synchronous online instruction).

existing practices by emphasizing active learning,[5] challenging traditional hierarchies,[6] and encouraging experimentation.[7]

Each of these movements is enabled, in part, by the widespread adoption and acceptance of videoconferencing software, such as Zoom, Google Meet, and Microsoft Teams, that accelerated from March of 2020.[8] These videoconferencing applications evolved and adapted under the pandemic's pressure, emerging as richly featured tools capable of facilitating sophisticated virtual interactions among many synchronous participants.[9] For the first time, teachers of law had a "killer app" that promised to unlock the nascent potential of online legal education.[10] Zoom's catalytic effect on pedagogy belies the fact

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5. *See* Margaret Ryznar, *Lessons from Teaching Tax Online*, 19 PITT. TAX REV. 295, 321 (2022) (discussing the use of formative assessments in a "mix-and-match" approach); Kohn, *supra* note 4, at 249–50 ("Professors who learn to engage and educate students in the virtual classroom are likely to be better teachers when they return to brick-and-mortar classrooms."); McPeak, *supra* note 2, at 564 (emphasizing "asynchronous online active-learning content that forms the framework for the [face-to-face] course").

6. *See* Kinda L. Abdus-Saboor, *Lessons from Pandemic Pedagogy: Humanizing Law School Teaching to Create Equity and Evenness*, 69 J. LEGAL EDUC. 621, 622 (2020) (arguing that "pandemic pedagogy" provides "the opportunity to continue to dismantle the antiquated and dysfunctional ideals that guide legal education and permanently replace them with practices that humanize the law school experience"); Ronald J. Colombo, *Teaching a Synchronous Online Business Organizations Course to J.D. Students: A Case Study*, 48 HOFSTRA L. REV. 873, 917–18 (2020) (noting that, on Zoom, students "did not encounter the unfortunate social cues that sometimes inhibit class participation"); Katherine Pratt, *Reflections on Law Teaching at the Post-Pandemic Crossroads,* 19 PITT. TAX REV. 217, 218 (2022) (discussing communal learning in the wake of the pandemic). *But see* Schremmer, *supra* note 4, at 696 (contending that online interaction may "exacerbate or increase the frequency of inequities already encountered in in-person settings").

7. *See* Heather M. Field, *How the Pandemic Flipped My Perspective on Flipping the Tax Law Classroom*, 19 PITT. TAX REV. 267, 268 (2022) (describing successful results from "flipping" portions of courses for the 2020–2021 academic year); Margaret Ryznar, *supra* note 5, at 317 ("The lesson from online teaching for in-person lectures is to make them multi-dimensional with illuminating extra content, along policy and interdisciplinary lines."); Bridget J. Crawford & Michelle S. Simon, *Law Faculty Experiences Teaching During the Pandemic*, 65 ST. LOUIS UNIV. L.J. 455, 464 (2021) ("[T]he pandemic has revived longstanding conversations about the purpose of law teaching."); Daniel Keating, *Finding New Classroom Tricks in a Virtual Teaching World: One 'Old Dog's' Tale*, 70 J. LEGAL EDUC. 462, 462 (2021) (discussing the use of novel pedagogical tools by three faculty members who "have taught for more than 100 years combined").

8. *See* ZOOM, https://zoom.us [https://perma.cc/Q786-WJHG] (last visited June 15, 2024); MICROSOFT TEAMS, https://www microsoft.com/en-us/microsoft-teams [https://perma.cc/Q8RF-FGLN] (last visited June 15, 2024). Although Zoom occupied much of the popular imagination during the pandemic, numerous alternatives exist, such as Cisco WebEx and Google Meet. *See* Mike Isaac & Sheera Frankel, *Zoom's Biggest Rivals Are Coming for It*, N.Y. TIMES (Apr. 24, 2020), https://www nytimes.com/2020/04/24/technology/zoom-rivals-virus-facebook-google html. Although this Article focuses on Zoom, this Article's arguments apply to other products with comparable features.

9. For chronologies of how Zoom implemented various features across different operating systems, *see Release Notes for the Zoom Workplace App*, ZOOM SUPPORT (June 13, 2024, 9:55 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0061222 [https://perma.cc/76SL-WNCK].

10. *See* Froomkin, *supra* note 3, at 366 ("If I had to pick one reason . . . that we spent twenty years teaching in classrooms instead of cyber-something, . . . I'd say it was the absence of a killer app."). *See also* Keating, *supra* note 7, at 463 ("The platform we used [in 2013] was solid for its

that no single aspect of Zoom, by itself, is particularly pathbreaking.[11] What is revolutionary, however, is how Zoom bundles diverse functionalities into a coherent package.[12]

By recasting Zoom as a bundle of classroom functionalities—as an in-person learning platform—this Article presents a novel use case for Zoom in legal education, distinct from the software's (now, relatively pedestrian) role as a vehicle for remote synchronous instruction.[13] This proposed use case unsettles the conventional pandemic-era evaluative frames for Zoom and other videoconferencing applications. Instead of focusing on whether Zoom's virtual environment adequately substitutes for in-person class sessions, I argue that faculty can deploy Zoom directly into physical classrooms to enhance in-person teaching—with spillover benefits for occasional remote instruction.[14] And, instead of translating Zoom-enabled pedagogical practices to in-person instruction on a one-off basis, I focus on Zoom's delivery of an integrated suite of teaching enhancements that instructors can deploy dynamically in physical spaces.[15] In the pandemic's wake, Zoom remains deeply ingrained in daily life—a brand-turned-verb in the vein of Google or Xerox.[16] This familiarity (and, for many, persistent ubiquity) provides leverage in shaping our in-person interactions, as well as our virtual ones.

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time, but not as sophisticated as the one Zoom offers now."); Colombo, *supra* note 6, at 906–07 (describing a "majority view" that Zoom is "robust enough to ensure a smooth class experience"). *But see* Thomson, *supra* note 2, at 706 ("[E]ffective online teaching . . . is not about the technology involved.").

11. The exception might be Zoom's general stability in maintaining quality connections among participants. *See* Shannon Bond, *A Pandemic Winner: How Zoom Beat Tech Giants to Dominate Video Chat*, MORNING EDITION (Mar. 19, 2021, 5:00 AM), https://www npr.org/2021/03/19/978393310/a-pandemic-winner-how-zoom-beat-tech-giants-to-dominate-video-chat [https://perma.cc/SX2R-ADMY] (attributing Zoom's success to its "simplicity, combined with high-quality video and stable connections"); Shira Ovide, *No, the Best Doesn't Win*, N.Y. TIMES (Apr. 27, 2020), https://www nytimes.com/2020/04/27/technology/no-the-best-doesnt-win html ("Why Zoom? Because it nails the basics.").

12. Outside of education, Zoom has positioned itself as a platform for bundled features conducive to hybrid work. *See* Theresa Larkin, *12 Zoom Platform Hybrid Work Features You May Be Missing Out On*, ZOOM BLOG (June 5, 2023), https://blog.zoom.us/12-zoom-platform-hybrid-work-features [https://perma.cc/U5SZ-6WRW].

13. Similar arguments apply to other videoconferencing applications. This Article addresses Zoom as illustrative (and perhaps hegemonic) but not exceptional.

14. *See* Blatt, *supra* note 4, at 287 ("The unique issue raised by the recent shift to virtual learning is the suitability of videoconferencing as a replacement for live classes, with or without supplementary features.").

15. *See* Graffy, *supra* note 2, at 47 ("[T]he technology used during the pandemic included features that many of us do not want to abandon once we are back in the classroom."); Keating, *supra* note 7, at 472 ("[W]hen it is finally time to return to in-person teaching, I believe that most of the teaching innovations I learned on Zoom can be adapted for the brick-and-mortar classroom.").

16. *See* Jeffrey Cole, *Googling, Ubering and Xeroxing: How Zooming Became a Verb in Six Months*, CTR. FOR DIGIT. FUTURE (Sept. 23, 2020), https://www.digitalcenter.org/columns/zooming/ [https://perma.cc/S6UM-S5Q5].

In this Article, I detail various concrete implementations of Zoom's features for in-person legal education.[17] These implementations arise out of my personal experience in pandemic-necessitated remote education, as well as my own efforts to expand active learning and formative assessments in my courses—especially as my students returned to in-person instruction.[18] My subject area, federal income taxation, shapes the nexus in my teaching between technology and pedagogy.[19] In this context, Zoom works well as an in-person learning platform. The same result may hold across other areas of law to varying degrees.[20] Furthermore, pandemic-related emergency remote teaching mediated my experimentation with Zoom. Had I adopted Zoom more organically, my practices might have evolved differently. For these reasons, I do not claim to establish general theories of Zoom deployment. These caveats should not detract from my central argument: videoconferencing applications can facilitate more effective in-person instruction.

This Article proceeds as follows. Part II situates Zoom (and similar videoconferencing applications) within the conventional categories of educational software platforms. Part III discusses eight features of Zoom that can enhance law school teaching outside of virtual space. Part IV explores the advantages and disadvantages of using Zoom in physical classrooms, with an emphasis on the ways that Zoom, as an in-person learning platform, refigures conventional modes of instruction. Part V concludes.

II. PLATFORMS AND MANAGEMENT SYSTEMS

In the wake of the pandemic, Zoom occupies a position in higher education that is defined, in part, by what the software does not do. Zoom is not an online course marketplace, like Coursera, edX, or Udemy, that matches producers and consumers of higher education content.[21] Neither is Zoom a comprehensive learning management system (LMS) like Canvas, Blackboard, or Moodle. Zoom is not (and is not intended to be) a full-featured course management system (CMS) for running synchronous or asynchronous online

17. *See* discussion *infra* Part II. My focus is on "doctrinal" teaching: the delivery, at scale, of substantive legal topics in discrete units. For skills, writing, and seminar-style courses, an in-person learning platform may not be necessary.

18. For another discussion of these factors in tax teaching, *see generally* Pratt, *supra* note 6.

19. *See generally* Paul L. Caron & Rafael Gely, *Taking Back the Law School Classroom: Using Technology to Foster Active Student Learning*, 54 J. LEGAL EDUC. 551, 558 (2004) (discussing the backlash against technology in law school classrooms and proposing to "take back" classrooms through "a mix of old and new technologies").

20. *See* Kristin B. Gerdy et al., *Expanding Our Classroom Walls: Enhancing Teaching and Learning Through Technology*, 11 LEGAL WRITING: J. LEGAL WRITING INST. 263, 274 (2005) (noting that choices about technology should flow from articulated learning outcomes).

21. *See generally* Stephen Colbran & Anthony Gilding, *MOOCs and the Rise of Online Legal Education*, 63 J. LEGAL EDUC. 405 (2014).

content.[22] Notwithstanding Zoom's incongruence with conventional technology categories in higher education, the application retains a pervasive presence across campuses.

In the education context, Zoom excels at three things. First, Zoom creates a durable shared space for synchronous interchange among individuals. Although primarily mediated by video, this shared space more generally provides a common nexus for real-time communication. Second, Zoom includes various tools directed at specific modes of interaction, such as hand-raising, with clear counterparts in traditional classrooms. These tools both replicate and expand on physical interactions. Third, Zoom is familiar after widespread use during the pandemic. From this perspective, Zoom operates as a custom or convention that lowers transaction costs across groups of disparate individuals.[23] These three qualities—a shared space, a suite of ancillary tools, and familiarity—make Zoom a uniquely viable tool for in-person instruction at law schools.

From a holistic perspective, Zoom functions as a type of "learning platform," a term that attempts to capture the infrastructure-like qualities and bundled functionalities of contemporary videoconferencing software.[24] Much like an in-person classroom, Zoom structures learning within narrow spatial and temporal boundaries.[25] For remote synchronous instruction, Zoom typically is the teaching environment. The application mediates students' instructional experience in ways that run from the tangible (such as polling) to the less overtly perceptible (such as screen-sharing by an instructor). Whether remote or in-person, Zoom stops when class ends. The application acts as a limited-scope platform for synchronous teaching. This Article claims that Zoom operates—perhaps better—as an in-person learning platform.[26]

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22. *See* Froomkin, *supra* note 3, at 387 ("[T]he technology most in use in fall 2020 or spring 2021 just was not good enough to equal or surpass the quality of in-person teaching in most cases."). For the distinction between LMSs and CMSs, *see* William R. Watson & Sunnie Lee Watson, *An Argument for Clarity: What Are Learning Management Systems, What Are They Not, and What Should They Become?*, TECHTRENDS, Mar.-Apr. 2007, at 28, 29–30.

23. For example, the Zoom application already may be installed on many student and faculty devices.

24. For a discussion of platforms in higher education, *see* Stephen Marshall & Michael Sankey, *The Future of the Learning Management System in the Virtual University*, *in* TECH.-ENHANCED LEARNING AND THE VIRTUAL UNIV. 12–16 (Michael David Sankey et al. eds., 2023).

25. Zoom describes itself as a "virtual classroom," but this term lacks clear parameters. *See An Educator's Guide to Using Zoom in the Classroom*, ZOOM, https://www.zoom.com/en/industry/education/resources/educator-guide/ [https://perma.cc/Q4UF-XMYD] (last visited June 15, 2024).

26. *See*, *e.g.*, Keating, *supra* note 7, at 462. One corollary is that in-person use of Zoom mitigates some of Zoom's drawbacks in online education. *See infra* Part II. For a list of challenges when teaching with Zoom, "the most commonly used platform for synchronous teaching" in the pandemic, *see* Froomkin, *supra* note 3, at 387.

This in-person use case for Zoom complements the integration of more comprehensive software platforms—namely, LMSs—in higher education. LMSs provide deep course-management features, such as assessment devices and student progress metrics, as well as communication tools and shared interactive spaces such as discussion threads.[27] LMSs are "complex ecosystem[s] of interconnected technologies providing a range of services" that students and faculty can access at any time through their Internet-connected devices.[28] Although LMSs may include classroom-oriented features such as polling, LMSs principally facilitate asynchronous out-of-class interactions.[29] Essentially, LMSs support "traditional classroom-based communications."[30] Although LMSs have near-universal acceptance, these systems leave a gap where synchronous instruction occurs.

Other classroom technologies fill the gap created by LMSs, typically on an idiosyncratic basis.[31] Student laptops allow for notetaking as well as on-demand access to digital textbooks, primary materials, and secondary authorities. Presentation software, such as PowerPoint, runs on projection equipment to share instructors' visual content with students. Polling and other feedback mechanisms operate by software or hardware interfaces. Recording occurs through setups ranging from automated capture of class sessions to one-off instructor-driven contrivances.[32] The scattershot implementation of classroom technologies contrasts LMSs' comprehensive scope—and typically imposes significant transaction costs on instructors.

Behind the fragmentation of classroom technologies lies instructors' varied pedagogical preferences. To the extent instructors adopt these

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27. *See* Marshall & Sankey, *supra* note 24, at 7–8; *see also* Yvonne M. Dutton & Margaret Ryznar, *Law School Pedagogy Post-Pandemic: Harnessing the Benefits of Online Teaching*, 70 J. LEGAL EDUC. 252, 259–60 (2021) (arguing that instructors in asynchronous online courses have an incentive to use LMSs' features fully).

28. *See* Marshall & Sankey, *supra* note 24, at 5.

29. For example, Instructure piloted Polls for Canvas, a mobile polling application that was discontinued in early 2021. At present, third-party polling applications, such as Zoom and Poll Everywhere, can be integrated with Canvas. *See Configuring Polling and Assignments with Canvas*, ZOOM SUPPORT (Oct. 28, 2023, 1:16 AM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0065267 [https://perma.cc/S43X-CDTP]. LMSs also enforce structure and organization on course content and interactions. *See* Ryznar, *supra* note 4, at 317 ("[O]ne lesson from the student responses is to have a strong organization of the course and its content.").

30. *See* Darren Turnbull et al., *Learning Management Systems: An Overview*, *in* ENCYCLOPEDIA OF EDUC. & INFO. TECHS. 4 (Arthur Tatnall ed., 2019). *See also* MICHAEL FLAVIN, RE-IMAGINING TECHNOLOGY ENHANCED LEARNING: CRITICAL PERSPECTIVES ON DISRUPTIVE INNOVATION 145 (2020) ("There has been no digital revolution in higher education.").

31. LMSs may offer integration of third-party applications.

32. For a list of instructional technologies, *see* Gerald F. Hess, *Blended Courses in Law School: The Best of Online and Face-to-Face Learning?*, 45 MCGEORGE L. REV. 51, 55 (2013). In many cases, these technologies extend beyond the classroom. For example, presentation slides posted to an LMS may supplement notes taken in class, and a commercial casebook's digital resources may reinforce course concepts.

technologies individually, idiosyncratic choices make sense. Instructors can pick the best-fitting implementation for their desired outcome, and this process repeats as these instructors introduce additional classroom technologies. Furthermore, institutional practices shape instructors' technology decisions.[33] Not every instructor uses every technology; therefore, resource constraints favor selective deployment over universal availability.[34] Norms of academic freedom also encourage deference to instructors' discretion in classroom operations, including technology. Higher education is easily amenable to decentralized decisions about classroom technology.

In this context, repurposing general-use software like Zoom makes sense. After the pandemic, videoconferencing software became licensed and distributed widely. Accelerated pandemic-era development means that this software has an array of features, including many adaptable to classrooms. For these reasons, refiguring Zoom as an in-person learning platform offers an opportunity to unify previously disparate classroom technologies and facilitate broader use by lowering the costs of adoption.

III. ZOOM IN PHYSICAL SPACE

Videoconferencing software, such as Zoom, offers a variety of tools that can enhance physical law school classrooms. This Part focuses on eight distinct features of Zoom that, in my view, apply most directly in the specific context of legal instruction. These eight features—shared visuals, virtual whiteboards, polling, chat and private messaging, hand-raising and reactions, various accommodation and accessibility tools, support for remote or hybrid teaching, and the ability to track attendance and participation—are not unique to videoconferencing software. Each feature mirrors technologies and processes already available to law faculty. However, Zoom bundles these features into a coherent package, making the whole greater than the sum of its parts.[35] After heavy use during the pandemic, Zoom retains ubiquity and familiarity in higher education—and an ease of use—that highlights the ways in which full-featured videoconferencing software augments and enriches conventional law school education.[36]

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33. This constraint applies strongly to LMS choices.

34. For example, large classrooms may include built-in projection and recording capabilities, while small classrooms may be furnished with less flashy technologies such as non-hierarchical seating.

35. *See infra* Part III.

36. *See 5 Reasons Why Zoom Will Benefit Your Small Business*, ZOOM BLOG (Sept. 23, 2022) https://www.zoom.com/en/blog/zoom-video-communications-small-business-benefits/ [https://perma.cc/PZ74-YN26] (listing as the first reason, "Zoom is easy to set up, use, and manage"). Others have noted the ability of Zoom's "ancillary features" to "enhance the traditional classroom." *See* Blatt, *supra* note 4, at 287 (arguing that in-person instruction can replicate many of

A. ZOOMING IN, IN-PERSON

The mechanism to deploy Zoom as an in-person learning platform is straightforward. Instructors and their students log into a Zoom room while present together in a physical classroom. Instructors and students share the same physical and virtual spaces, which facilitates interplay between the two modalities. Cameras and microphones remain off, and Zoom's core videoconferencing functions are not used directly.[37] Instead, Zoom's rich suite of ancillary features takes center stage.

The essential insight is that concurrent physical and virtual spaces allow users to leverage one modality's strengths to complement the other's weaknesses. This strategy is not "blended" learning, which mixes in-person and remote instruction.[38] In-person instruction—with its pedagogical and psychological benefits—remains central to this endeavor.[39] But, as law school faculty deploy a broader array of teaching techniques, they exert concomitant pressure on classroom technologies.[40] An important step in this larger project requires rethinking these technologies' deployment.[41]

B. SHARED VISUALS

Projection equipment is a staple of law school classrooms. As a vehicle to share visuals, Zoom offers several advantages compared to linear projection in which an instructor's screen appears verbatim for students. These advantages include Zoom's native abilities to share windows rather than full screens, swap between shared windows, and permit students to share material electronically. The effect is a more flexible visual environment for teaching.[42]

Zoom's "ancillary features" using separate technology). These discussions, however, are not comprehensive and do not address the ways in which Zoom bundles myriad features.

37. Eliminating video may enhance participants' experiences with Zoom. *See* Kristine M. Kuhn, *The Constant Mirror: Self-View and Attitudes to Virtual Meetings*, 128 COMPUTERS IN HUM. BEHAV. 107110 (2022); Tyne Daile Summer, *Zoom Face: Self-Surveillance, Performance and Display*, 43 J. INTERCULTURAL STUD. 865 (2022).

38. *See* Hess, *supra* note 32, at 52–58.

39. *See* Blatt, *supra* note 4, at 289 ("[T]he transition to videoconferencing leaves us more vulnerable to sadness and anxiety.").

40. *See, e.g.*, Heather M. Field, *A Tax Professor's Guide to Formative Assessment*, 22 FLA. TAX REV. 363 (2019); Renee Nicole Allen & Alicia R. Jackson, *Contemporary Teaching Strategies: Effectively Engaging Millennials Across the Curriculum*, 95 U. DET. MERCY L. REV. 1 (2017). *See* Steven I. Friedland, *Adaptive Strategies for the Future of Legal Education*, 61 LOY. L. REV. 211, 213–14 (2015).

41. *See* Caron & Gely, *supra* note 19, at 568 (arguing that technology "should be complementary to other forms of exchanges between students and faculty [and] should not close off other avenues for student-faculty interaction").

42. Zoom may be deployed in classrooms in three ways. In a smart classroom, Zoom may run natively, with projection capabilities, and an instructor may use a separate device to join the smart classroom's Zoom room (with appropriate privileges). In classrooms with a shared computer connected to a projector, instructors may run Zoom on the in-room computer and use a separate device

Many projection systems share the input device's full screen. Presentation software, such as PowerPoint, typically allows alternative interfaces that project specific content while showing the instructor's upcoming slides, notes, and settings.[43] These interfaces tend to limit instructors during a presentation. For example, PowerPoint cannot include images in a slide's notes, and access to settings is limited.

By contrast, instructors can share single windows through Zoom, with open windows visible to instructors but not projected to the classroom.[44] By default, Zoom highlights the shared window with a green border, and instructors can access other open windows without disturbing the projection.[45] Furthermore, instructors' choice of other open windows is limited only by the hardware available. In my classes, I typically keep open (and visible) windows with my class notes, an electronic copy of my slides, and my attendance file, as well as any documents or tools that I anticipate using during the session.

Zoom also facilitates switching the classroom projection among these open windows. Unlike with a dedicated full-screen projection, switching windows through Zoom imposes little burden on the instructor and appears instantaneous to the audience.[46] Any fumbling around occurs off the projected screen. Recall, the options for shared windows are limited only by hardware. Instructors can seamlessly integrate blank or pre-generated word processor documents, shared files for collaborative activities, browser windows, and media files into the presentation. Similarly, the return to presentation software is smooth.

Finally, Zoom permits students to share their personal screens to the projector.[47] This feature can facilitate small-group activities where outcomes are recorded and presented to the class.[48] These types of collaborative visuals are awkward to replicate over linear projection; Zoom's concurrent virtual space enables these activities. There may be attendant risks. For instance, students

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to join that Zoom room. In classrooms with video input to a projector, instructors may connect a separate device to the projector, extend their desktops to the projector (instead of mirroring), and maximize Zoom's screen-share window in the projector's screen. (Zoom's screen-share window is enabled by checking "use dual monitors" in settings). Then, instructors may share windows on their device's screen to the projector.

43. In PowerPoint, this interface is "Presenter View."

44. PowerPoint slideshows run in a separate window, rather than full screen, when their show type is "browsed by an individual (window)."

45. *See Easy Screen Sharing in Virtual Meetings*, ZOOM, https://www.zoom.com/en/products/virtual-meetings/features/screen-sharing/ [https://perma.cc/U73R-96NE] (last visited June 15, 2024).

46. This idea of switching costs relates to the term's broader use to describe consumers' monetary or perceived barriers to changing from one alternative to another.

47. Zoom's security settings may limit this type of screen sharing.

48. *See* Dutton & Mohapatra, *supra* note 4, at 481.

screen-sharing effectively cedes control over shared content, subject to the instructor's oversight, management, and override. An assignment's design can mitigate any potential drift or loss of focus. This flexibility, however, emphasizes how Zoom's built-in features unlock alternative uses for shared visuals compared to conventional projection set-ups.

C. WHITEBOARDS

Writable boards are common to both physical and virtual classrooms. In physical classrooms, permanent boards typically are mounted in the "front" of the room.[49] Virtual classrooms, of course, have virtual boards. When paired with a projection system, Zoom allows physical classrooms to use virtual boards.

In-person virtual boards have several advantages. Depending on classroom size and configuration, students may find physical boards difficult to see.[50] Writing on physical boards can be low-contrast and hard to discern; distance and angles only compound these issues. By contrast, virtual boards are at least as visible as other shared visuals, since they operate through classrooms' projection systems. Virtual boards appear on students' devices when run through Zoom.[51] Recordings also may capture virtual boards more clearly than physical boards, and, if instructors choose Zoom's "persistent digital canvas," students can reference the virtual board through their accounts after a class ends.[52] Compared to physical boards, virtual boards are visible to students in more places, and on the students' own terms. By making the board portable and replicable, content is more accessible to students. Finally, virtual boards typically include various drawing tools that can enhance the instructors' board work. These types of shortcuts as well as the availability of multiple persistent virtual boards can help streamline the live creation of visual materials.

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49. Chalkboards, despite their pedestrian reputation, are a transformative classroom technology that dates from the middle of the nineteenth century. *See* Steven D. Krause, "*Among the Greatest Benefactors of Mankind": What the Success of Chalkboards Tells Us About the Future of Computers in the Classroom*, J. MIDWEST MOD. LANGUAGE ASS'N, Spring 2000, at 6.

50. *See* Graffy, *supra* note 2, at 49–50 (discussing the limitations of physical classroom spaces).

51. As with shared visuals, virtual boards allow instructors to invite collaboration from students. For example, instructors could invite students to help create concept maps or other graphical representations of material. Because students almost certainly lack appropriate input devices, these types of activities are better suited for other implementations of shared visuals.

52. *See Sharing a Classic Whiteboard*, ZOOM SUPPORT (Feb. 7, 2024, 6:42 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0068305 [https://perma.cc/3RMP-6E6T]. Zoom also offers a transient whiteboard, which has privacy and other advantages over the persistent digital canvas.

The primary disadvantage of virtual boards comes on the instructor's end. Virtual boards require an input device, such as a tablet with a stylus or a drawing pad. Instructors must carry this additional hardware, and the input software over Zoom may strain older computers. These input devices also have a learning curve, though I find them fairly intuitive over time. Notwithstanding these limitations, virtual boards can supersede physical boards in ways that complement Zoom's shared visuals for in-person instruction.

D. POLLING

For more than two decades, legal educators have employed audience response systems to solicit student input in real time.[53] Faculty interest in these types of systems accelerated after 2015, when American Bar Association standards mandated formative assessments in law schools, and again during the pandemic, when various videoconferencing platforms lowered barriers to implementation in virtual classrooms.[54] This technology, sometimes referred to as "clickers," has evolved from individual physical devices with a handful of buttons to app- or web-based online portals that allow for nuanced input.[55] The latter category includes Zoom's instant polling feature, which collects participants' responses through a customizable on-device interface. This polling feature works seamlessly within Zoom's broader ecosystem of presentation tools.

Although Zoom's polling feature offers many options for collecting student input, the feature's advantages reside primarily in its ease of use. Instructors can program a series of advance questions, with response formats ranging from multiple choice to textual input to rating scales.[56] Then, instructors launch polling from within the Zoom application. The polling feature shows the instructor a timer; alternatively, the timer feature can be visible to all participants.[57] Zoom tabulates results automatically, and instructors can

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53. *See generally* Caron & Gely, *supra* note 19 (discussing two instructors' use of these systems in the early 2000s).

54. *See* A.B.A. Standard 314. *See also* Dutton & Ryznar, *supra* note 27, at 258–59 (discussing A.B.A. Standard 314). *See, e.g.*, Keating, *supra* note 7, at 465 ("[Polling in the pandemic] has truly transformed the way that I teach my classes.").

55. *Compare* Caron & Gely, *supra* note 19, at 560–62 (physical clickers), *with* Charletta A. Fortson, *Now is Not the Time for Another Law School Lecture: An Andragogical Approach to Virtual Learning for Legal Education*, 65 ST. LOUIS UNIV. L.J. 505, 510 (2021) (Zoom polling).

56. *See Understanding Question Types for Surveys, Polls, and Quizzes*, ZOOM SUPPORT (Oct. 27, 2023, 11:44 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0057587 [https://perma.cc/6N7H-2233]. For discussion of various question types in formative assessment, *see* Field, *supra* note 37, at 408–12.

57. *See Using the Zoom Timer App*, ZOOM SUPPORT (Nov. 29, 2023, 11:20 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0068677 [https://perma.cc/VG3Q-5SKS].

share these summaries with participants, along with their individual answers.[58] The summaries persist on students' screens, independent of projected visuals.[59] For instructors, navigating these mechanics requires relatively few motions—a simplicity that belies the array of options available to construct polls within Zoom.

Zoom's polling feature shines, however, when reduced to a more minimal instantiation. In my classes, I use a generic multiple-choice framework that I implement with the help of shared visuals.[60] Essentially, I ignore the depth of Zoom's polling feature to replicate the austerity of a five-button hardware clicker. In Zoom, the polling prompt refers students to in-class slides, which give the relevant facts and questions.[61] The virtual poll's answer choices are labeled A through E, which correspond to detailed options projected in the classroom.[62] This substantive prompt can be paired with a second question that asks students' subjective confidence in their answers,[63] and this generic framework is infinitely recyclable during a single class session and across multiple classes,[64] with the caveat that restarting the poll resets all historical responses.[65] When I need to track individual students' answers, I turn to an alternative format.[66]

To achieve my pedagogical polling goals, Zoom simply needs to collect and display students' aggregate responses.[67] For each polled in-class question, I ask students to spend between one and two minutes discussing the

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58. The ability to share individual and collective data immediately is crucial. *See* Keating, *supra* note 7, at 467 (discussing the sharing of results for Zoom polls). *See also* Andrele Brutus St. Val, *Survey Says—How to Engage Law Students in the Online Learning Environment*, 70 J. LEGAL EDUC. 297, 324-25 (2021) (discussing variety in feedback).

59. Instructors can view responses by participant and download results in spreadsheet format.

60. Multiple instructors could implement different generic polls in the same Zoom classroom.

61. This technique is well-traveled. *See* Dutton & Ryznar, *supra* note 27, at 259.

62. My generic prompt is "See slides for question." The answer choices are the capital letters A through E, and participants are permitted to select only one answer.

63. This question reads, "How confident are you in your answer to the question?" Participants may select from a five-point scale of "very confident," "confident," "neither confident nor not confident," "not confident," and "not at all confident." Because tax law demands concrete answers under uncertainty, this second question focuses students on the probabilistic nature of advising. *See* Field*, supra* note 40, at 420–32.

64. Instructors can poll students again on the same question. *See* Roger C. Park, *Reflections on Teaching Evidence with an Audience Response System*, 75 BROOK. L. REV. 1315, 1320 (2010).

65. Instructors can download responses before restarting the poll.

66. For example, I use Zoom's chat function, as well as asynchronous forms (such as Google Forms), to collect open-ended or textual responses.

67. I do not collect or monitor students' individual responses, which are best kept anonymous and transient. *See* St. Val, *supra* note 58, at 325 ("[A]nswers can be anonymous, which lets students feel more comfortable in being honest about what they do not understand."); Field, *supra* note 40, at 404 ("An anonymous voting mechanism helps ensure that students are making independent decisions about their answers . . . .").

question with a classmate.[68] These questions typically explore the application of law to hypothetical facts, then prompt students to address a discrete consequence of these facts.[69] Students have a clear starting point, a concrete goal, and a tangible output to work towards. My polling framework encourages students to commit to their positions. Even when multiple answer choices might be reasonable, students—like attorneys—must select and defend the best one under uncertainty. The stakes are relatively low because answers are anonymous.[70] Zoom tabulates and shares the accumulated results for immediate feedback, and these results frame subsequent classroom conversation. Through these activities, my generic polling framework structures and directs collaborative learning among students.

My generic polling framework also allows for a variety of question types. For example, I can adapt five generic answer choices to binary questions, as well as to ordering questions and questions with multivariate answers.[71] The real strength of this framework, however, lies in the classroom discussion that follows. My in-class questions tend to align along three different paradigms: algorithm, ambiguous, and judgment questions. Algorithm questions elicit student engagement with complex legal regimes using largely unambiguous fact patterns.[72] Such questions are objective.[73] Ambiguous questions do not have a clear answer, at least within the class's closed universe of primary authorities.[74] Finally, some questions draw on (and develop) students' judgment.[75] Most in-class questions (and, I believe, most questions in legal practice) blend these three paradigms, and I approach post-question classroom discussion—initiated by Zoom results—as an opportunity to elicit comments that complicate the boundaries of these categories.

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68. *See* Park, *supra* note 64, at 1320 (describing how polling "facilitated a 'talk to your neighbor' approach to teaching"). There are social and networking advantages to this collaborative model. *See* Froomkin, *supra* note 3, at 359 (noting that social aspects of legal education "threaten to get lost in an all-virtual environment").

69. Often, these hypotheticals build on problems that I ask students to prepare in advance of each class session. For example, how much income, if any, does a specific taxpayer have as a result of a stated transaction?

70. *See* Field, *supra* note 40, at 395.

71. For binary questions, "A" is "true" (or "yes"), and "B" is "false" (or "no"). Ordering questions and multivariate answers require constructive answer choices that address combinations of outcomes.

72. *See* Sarah B. Lawsky, *Teaching Algorithms and Algorithms for Teaching*, 24 FLA. TAX REV. 587, 588-96 (2021). For example, an algorithm-style question might ask for the amount of gain or loss recognized by a taxpayer who engages in a like-kind exchange of real property in which the taxpayer receives both.

73. *See* Park, *supra* note 64, at 1321.

74. For example, I ask whether taxpayers realize income when exchanging one Bitcoin for one Wrapped Bitcoin.

75. For example, during the first meeting of an income tax class, I ask for students' intuitions about whether various items constitute income for tax purposes.

The key to the above discussion is just how little direct emphasis falls on Zoom. The bulk of students' active learning occurs outside of the virtual polling interface, which collects, aggregates, and disseminates data. Eliciting student engagement, rather than hardware or software implementation, is the "game-changer" for law classrooms.[76] The mechanics of classroom polling are important, however, in that they operate best when not drawing attention. Zoom provides a self-contained, common interface that promotes ease-of-use and facilitates switching between activities—an ideal background implementation. By contrast, single-purpose polling software, such as Poll Everywhere, requires an additional application for both faculty and students, as well as some technical facility to embed polls in presentation software such as PowerPoint.[77] Zoom's advantage is that it effectively integrates polling with other learning technologies, which reduces compatibility issues and lowers transaction costs. As an in-person learning platform, Zoom may encourage greater use of polling in physical classrooms, like the application did during the pandemic's remote instruction.

E. CHAT AND PRIVATE MESSAGING

Compared to structured feedback mechanisms such as polling, *ad hoc* in-classroom communication has evolved little beyond physical hand-raising. By letting participants chat collectively or privately, Zoom provides another avenue, outside of speaking, for this type of communication. Moreover, Zoom's chat feature allows significant flexibility compared to conventional hand-raising, while also complementing Zoom's shared functions. This section outlines various uses of Zoom's chat feature, offers justifications for using this chat feature in in-person classes, and addresses the potential hazards of opening a channel for textual chat while conducting simultaneous oral discussion.

Zoom's chat feature—particularly private messaging—enables interactions between instructors and students for which physical hand-raising presents barriers. In my experience, some students prefer to raise technical problems, administrative questions, and potential errata through lower-stakes avenues that do not implicate every member of the class.[78] Students may raise substantive or clarifying questions through chat. For items that require immediate attention, chat works better than e-mail during class sessions. Conversely, instructors can communicate privately with individual students—

76. *See* Park, *supra* note 64, at 1320.

77. *See* Froomkin, *supra* note 3, at 388–89 (noting a post-pandemic "plethora of tools designed to facilitate online instruction" each of which "requires a licensing decision . . . , and most if not all will also require some training").

78. *See* Colombo, *supra* note 6, at 903–04.

perhaps to alert them to an imminent cold-call—or make textual announcements to the entire class. Zoom also permits file-sharing through chat, allowing instructors to circumvent ungainly LMSs to circulate digital items during class sessions. In this way, instructors can ensure a greater degree of parity in students' classroom experience. More broadly, chat increases equity by accommodating students who otherwise would feel uncomfortable raising questions in front of classmates.

In addition to opening an alternative channel for communication, Zoom's chat feature introduces options for soliciting responses to in-class prompts.[79] Students can provide textual responses as private messages through chat, with an opportunity for review and feedback from the instructor.[80] If instructors use a generic poll with multiple-choice answer choices, chat offers a vehicle to collect narrative responses to pre-planned questions—or an opportunity to ask spontaneous questions without a fixed format. For example, I conclude income tax sessions with an open-ended reflection for students.[81] Although I typically collect student commentary on these reflections through a Google Form,[82] Zoom's chat feature performs equally well.[83] Chat also allows for check-ins that ask for quantitative and qualitative information. One of these check-ins might ask students to rate their personal understanding of a doctrinal topic on a scale from one to ten, and then briefly explain why they chose this rating. Instructors can review these responses in class. In these ways, chat operates flexibly to fill needs that polling may not.

Three factors favor these uses of Zoom's chat feature. If students are reticent to raise topics orally, chat offers a parallel path to contribute to class discussion.[84] Not only can chat achieve equitable participation, but student responses may prove more accurate.[85] Chat and private messaging are also scalable without obviating individualized input. Although hand-raising could be used to gauge students' understanding in binary terms, chat allows for nuanced scales with textual explanations. Similarly, asking each student

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79. *See* Keating, *supra* note 7, at 470 (using chat to solicit student responses when teaching remotely).

80. Time for this feedback can be built into other activities, such as subsequent polling questions, or feedback can be deferred until after the class ends.

81. For example, I might ask for students' evaluation, from a fairness or equity perspective, of statutory changes to the taxation of alimony payments.

82. Google Forms preserves data across multiple iterations of a course.

83. Zoom can automatically save chat transcripts for after-class analysis. *See Saving In-Meeting Chat*, ZOOM SUPPORT (Nov. 9, 2023, 6:14 PM), https://support.zoom.us/hc/en-us/articles/115004792763-Saving-in-meeting-chat [https://perma.cc/9RMC-JCKE].

84. This dynamic holds in Zoom meetings outside of the classroom.

85. Private messaging is not anonymous. For many uses of chat, identification of responses with students may be important, and the baseline transience of Zoom's chat log provides some measure of privacy for students.

seriatim for verbal elaboration would absorb significant classroom time; chat simultaneously collects these responses. Finally, the use of Zoom as a learning platform lowers the costs of integrating chat and private messaging into in-person classrooms. Other messaging applications, like Slack, serve similar purposes. These applications, however, require additional software and integration for both instructors and students. Since in-classroom communication serves different purposes than out-of-classroom communication, there are efficiencies in bundling chat and private messaging with other classroom services.

The principal disadvantage of chat and private messaging involves distractions, i.e. "diminished mental presence," that detract from students' in-person experience.[86] These distractions exist for instructors and students. For instructors, planning can mitigate the potential for distractions. Review of chat logs can occur during specific times or, if the logs are saved, after class sessions. For example, I scan Zoom's interface for chat notifications when pausing to take in-person questions, and I save close study of chat responses for when students are working with each other. Regarding students' distraction, my anecdotal sense is Zoom encourages no more *sub rosa* communication than otherwise would occur.[87] I would prefer my students to message each other through Zoom than an outside application. With Zoom, messaging stays within the classroom's common interface, with fewer opportunities for distractions, intrusions, or switching costs from outside sources. Similarly, I prefer private messaging to even the best-intentioned whispered conversations. Unsanctioned communication mechanisms exist, and students do use them. To the extent that Zoom channels these types of interactions, the software minimizes net distractions where prohibition likely is impossible.[88] On balance, the potential for distractions seems less than the advantages of chat and private messaging.

F. HAND-RAISING AND REACTIONS

Zoom's virtual hand-raising feature, which includes various emoji-style reactions, meshes well with the application's other functions. Although Zoom's hand-raising feature largely duplicates physical hand-raising within an in-person classroom (both options are public to all participants), several

86. *See* Blatt, *supra* note 4, at 294 ("[R]unning a chat simultaneously with oral class discussion might be a net minus.").

87. I do not monitor students' use of private messaging with other students.

88. This approach to the perpetual crisis of technologies' distractions is not novel. *See* Caron & Gely, *supra* note 19, at 554.

situations make a virtual option meaningful.[89] Just as chat lowers communication barriers between instructors and students, virtual hand-raising encourages students who may be reticent to use a physical channel, with attendant equity benefits. Zoom's reactions library allows for flexibility with nonverbal expressions, which are a significant component of contemporary communication.[90] Other advantages of virtual hand-raising include visibility and queuing. Within a session, Zoom arranges participants by when they raised virtual hands, which allows instructors to address questions or comments in the order submitted. Similarly, Zoom's participant list clearly shows when students have raised hands, which may present challenges in some physical classrooms with large groups of students. Indeed, if restricted to a single modality for hand-raising, these reasons militate for choosing virtual over physical, even for in-person classrooms.

G. ACCOMMODATIONS AND ACCESSIBILITY

When deployed as an in-person learning platform, Zoom offers various features that promote classroom accommodations by increasing accessibility compared to conventional classrooms. The most important features involve recording, captioning, and remote attendance. These features in Zoom do not necessarily satisfy institutional obligations for accessibility under Section 508 of the Rehabilitation Act of 1973 or accommodations under the Americans with Disabilities Act of 1990 (ADA).[91] However, accommodations and accessibility operate beyond strictly legal bounds, and the colloquial promotion of these norms has benefits for individual students, as well as for equity and inclusion more generally.[92]

Although the recording of classroom activities raises legal, policy, and privacy concerns, the practice supports student needs across multiple contexts.[93] Conventionally, recording helps bridge gaps for students who miss

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89. Zoom's hand-raising is useful for synchronous remote instruction. *See* Dutton & Mohapatra, *supra* note 4, at 481.

90. In my in-person classroom, I welcome virtual hand-raising but have seen only isolated use of virtual reactions.

91. 29 U.S.C. § 794d (Rehabilitation Act of 1973); 42 U.S.C. §§ 12131–89 (Americans with Disabilities Act of 1990). In part, transcription through voice-recognition software generally is not accurate enough to satisfy Section 508 or ADA requirements. *See* Pratt, *supra* note 6, at 231 (noting the need for human intervention to correct transcripts).

92. See Kenneth R. Swift, *Five Truths Learned After a Dozen Years of Asynchronous Online Teaching*, 65 ST. LOUIS UNIV. L.J. 691, 700 (2021) (arguing that recorded classes, "if properly constructed, provide[] a level platform for all students, regardless of physical ability").

93. For a pre-pandemic discussion of legal and policy issues attendant to recorded classes, *see* Alexis Anderson, *Classroom Taping Under Legal Scrutiny—A Road Map for a Law School Policy*, 66 J. LEGAL EDUC. 372 (2017). For a pandemic-era update, *see* Diane Klein, *And Now, Charybdis: The Risks of Recording (Especially Synchronous) Classes*, DORF ON L. (Mar. 25, 2020), https://www.dorfonlaw.org/2020/03/and-now-charybdis-risks-of-recording html

in-person class sessions for illness, religious, or family obligations.[94] During the pandemic, many instructors recorded classes, either by choice or pursuant to institutional mandates.[95] Other students, however, may play portions of recordings to review material from class sessions in which they were physically present. The ability to review recordings gives students the ability to engage content at their own pace, rather than within the spatial boundaries of an in-person classroom.[96]

In my experience, a small number of students from each class account for the bulk of recording views; each view typically involves a targeted handful of in-class minutes.[97] Informal feedback from these students suggests that the ability to review recordings improves learning outcomes and exam performance. For heavy users, recordings matter. Whether used to remediate absences or review selections of class sessions, recordings expand access and accommodate students' learning preferences in ways that benefit some students more than others. In many ways, recordings disrupt longstanding hierarchies in education that prioritize classroom presence. The distributional aspects of recording seem to enhance equity among students.[98]

Zoom's recording feature offers several advantages over stand-alone setups that are built into many law school classrooms. Within Zoom, instructors can manage the content of recordings, a useful function, if class recordings should not include specific material, such as discussions of sensitive topics.[99] Although instructors can edit material out of recordings afterward, students

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[https://perma.cc/9J95-6NBB]. Institutionalized recording also alleviates incentives for students to make surreptitious—and potentially illicit—recordings with their own equipment.

94. Instructors, of course, can share recordings only with students who are absent for "excused" reasons, or share recordings for limited periods of time. Zoom's sharing feature for cloud recordings permits this kind of limited access. The trend among instructors who record, however, seems to favor universal availability. *See* Graffy, *supra* note 2, at 53 ("This knowledge [from the pandemic] has strengthened the case for recording classes and making them available as part of the learning process for all students.").

95. *See* Crawford & Simon, *supra* note 7, at 461 (finding that 60% of faculty who responded to a survey identified "students' ability to listen to recordings" as an advantage of pandemic-motivated remote instruction).

96. *See* Field, *supra* note 7, at 280. *See also* Sonia M. Suter, *Legal Education in a Pandemic: A Crisis and Online Teaching Reveal Who My Students Are*, 65 ST. LOUIS UNIV. L.J. 679, 687 (2021) (including students' ability to "review recordings" as a benefit of remote instruction).

97. Students who miss class sessions are incredibly uneven about viewing recordings—and almost universally view less than all the class sessions they miss. *See* Shivangi Gangwar, *Some Thoughts on the Corona Semester*, 65 ST. LOUIS UNIV. L.J. 517, 523 (2021) (noting generally poor uptake of recordings by students who missed synchronous classes during the pandemic).

98. The distributional effects of recorded law school classes warrant further specification. For a discussion of equity-enhancing aspects of recorded classes in the undergraduate context, *see* Jayashree S. Ranga, *Investigating the Impact of Course Content Usage on Student Learning in Upper-Level Chemistry Courses*, 99 J. CHEM. EDUC. 1563, 1563–64 (2022).

99. *See* Dutton & Mohapatra, *supra* note 4, at 483 (noting that students may not want their participation recorded, even for subjects that entail no specific sensitivities).

may feel comfortable with an announcement that the conversation is not recorded.[100] Since Zoom's recording feature is integrated with the software's other in-person classroom tools, recordings usually capture each component of a class session better, and instructors have greater control over the recording's content.[101] Shared visuals and virtual boards appear clearly within the recording.[102] Because Zoom simultaneously houses classroom inputs and outputs, the application's recording options account for variegated modes of delivery.

Zoom also offers live transcription of sessions, as well as closed captioning of recordings.[103] Live transcription uses voice-to-text software to generate concurrent on-screen captions, and users can see the full history of this transcription while the session unfolds. Captioning leverages these transcriptions, which Zoom generates as separate output, as optional synchronized overlays in video playback—essentially, closed captioning.[104] These integrated features serve four related purposes: students can view a real-time text rendition of classroom conversations, refer to a running transcript as class unfolds, read a complete (and searchable) transcript after class ends, and review the class session with closed captions.[105] Stand-alone recording software typically fulfills only the latter two purposes, which address accommodations and accessibility for students after-the-fact. Videoconferencing software is relatively unique in providing voice-to-text services during class sessions, which mitigates students' inevitable lapses in attention.

Regular in-person use of Zoom also facilitates legally required ADA accommodations that permit students to attend remotely.[106] Modality accommodations became salient after higher education's experience with emergency remote teaching during the pandemic, and such accommodations will

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100. After-the-fact editing also implicates data security concerns.

101. Instructors also can automate various aspects of Zoom's recording feature.

102. Notably, Zoom recordings do not capture the results of polling, though these results are available in a downloadable report.

103. *See Using Call Live Transcription*, ZOOM SUPPORT (Jan. 23, 2024, 11:51 PM), https://support.zoom.us/hc/en-us/articles/11990620676621 [https://perma.cc/GK5W-YHDK]; *see also Managing and Sharing Cloud Recordings*, ZOOM SUPPORT (Jan. 23, 2024, 10:51 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0067567 [https://perma.cc/82KS-WC9G].

104. On-screen captions seem to be most accurate for faculty speakers. Closed captions are available only through Zoom's cloud recording service, which implicates greater privacy concerns compared to locally generated recordings.

105. Captioning can improve learning outcomes. *See* Robert Keith Collins, *Using Captions to Reduce Barriers to Native American Student Success*, 37 AM. INDIAN CULTURE & RSCH. J., no. 3, 2013, at 75, 82 (finding, in an observational study, a one-grade-point increase for undergraduate students when videos were captioned).

106. For standards involving remote participation as an accommodation, *see* A.B.A. STANDARDS & RULES OF PROC. FOR APPROVAL OF L. SCHS. § 306(c) (A.B.A. 2017-2018).

likely increase over time.[107] Remote attendance accommodations mitigate some of the disadvantages of recorded classes, such as low uptake rates and an inability to participate meaningfully in classroom conversations.[108] When deployed as an in-person learning platform, Zoom makes remote attendance accommodations relatively easy to administer, especially when remote attendance occurs irregularly, with limited notice, or for temporary periods.[109] Additionally, students with remote attendance accommodations may face less stigma if their in-person classmates join Zoom's shared virtual space. Students with accommodations may appreciate anonymity in Zoom's sea of black rectangles.

Because Zoom is expressly designed for virtual spaces the application contains enhanced accessibility and accommodations features that do not typically exist in physical classrooms. For many students, there is a "curb cuts" effect to improvements with respect to accommodations and accessibility. Transcription, for example, helps students with reduced hearing and benefits those whose preferred language is not the instructional language and those who learn better by reading. Students may appreciate the value of accommodation and accessibility features after direct experience and experimentation. Having these features as part of the pedagogical background creates space for spillover effects, and this flexibility represents a key benefit of Zoom as an in-person learning platform.

H. HYBRID AND FLEXIBLE CLASSROOMS

In-person use of Zoom reduces transition costs when moving to alternative modalities, whether by choice or necessity. To the extent that in-person classroom infrastructure runs through Zoom's platform, changes to remote instruction involve novel technology for instructors, students, and remote visitors to in-person classrooms.[110] Polling and shared visuals *inter alia* operate

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107. For modality accommodations during the pandemic, *see* Kaitlyn Barciszewski, Note, *Pandemic Silver Lining: Discovering the Reasonableness of Remote Learning as an Accommodation Under the ADA*, 29 WASH. & LEE J. C.R. & SOC. JUST. 203 (2023). For current trends in modality accommodations, *see* Michael R. Masinter, *Assessing Remote Attendance and Remote Testing as Accommodations in On-Campus Courses*, 27 DISABILITY COMPLIANCE FOR HIGHER EDUC., no. 9, 2022, at 3; Nat'l Disabled L. Students Assn., *NDLSA Comment on Proposed ABA Standards Revisions* (Feb. 7, 2022), https://ndlsa.org/2022/02/07/ndlsa-comment-on-proposed-aba-standard-revisions/ [https://perma.cc/8S3Q-TACA].

108. The reasons for remote attendance vary from chronic disease to mental health to physical injury.

109. Although ease of implementation may lead to increased use (or overuse) of modality accommodations, enforcement of the scope of accommodations generally lies with program administrators, rather than instructors.

110. *See* McPeak, *supra* note 2, at 567 ("[S]ome course design techniques can help professors move seamlessly between these modes of instruction. The key is to build active learning experiences into face-to-face courses, preferably using a series of parallel online activities.").

as if in-person, with the overlay of Zoom's core videoconferencing feature.[111] For make-up classes or guest speakers, the efficiencies are attractive.[112] Faculty also may consider remote instruction that alleviates students' schedules. For example, institutions may allow students to attend class remotely for the final week of instruction after the Thanksgiving holiday.[113] Finally, disasters and other emergencies may necessitate periods of remote instruction. From this perspective, regular in-person use of videoconferencing software ensures against later dislocation from shifting modalities.

I. ATTENDANCE AND PARTICIPATION

Attendance appears to be an obvious advantage to Zoom as an in-person learning platform.[114] For each class session, Zoom can produce automated attendance reports.[115] If students join the Zoom room to vote in polls, read live transcripts, or access chat, the software records their presence and informs the instructor, singlehandedly alleviating a significant record-keeping obligation.[116] In addition, instructors can rely on poll reports or chat transcripts to substantiate student participation in class sessions. Zoom creates quantitative and qualitative data on student activities, and these data can form a basis for evaluation.

These strategies are not without concern. First, instructors who rely on Zoom-generated data risk narrowing their evaluative ambit, rather than broadening it. Instructors may succumb to a tendency to rely more heavily on quantitative data as they become more readily available through Zoom. Students should have more opportunities to show their engagement, rather than fewer. Second, students may attend remotely by gaming participation metrics.[117] Although honor codes and syllabus policies may discourage this type of abuse, policing these transgressions requires tracking both physical

111. Instructors also may use breakout rooms to replicate collaborative work time in an in-person classroom. I generally have had positive experiences with Zoom's breakout rooms, but other instructors have not. *See* Keating, *supra* note 7, at 470–71 (finding that 95% of student respondents favored one or zero breakout room activities per class session).

112. Zoom opens, for example, the possibility of virtual panels of remote guests.

113. Since the pandemic, my institution has done so for safety, climate, and quality of life reasons.

114. *See* Graffy, *supra* note 2, at 54.

115. *See Getting Started with Zoom Reporting*, ZOOM SUPPORT (Apr. 5, 2024, 11:37 AM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0060623 [https://perma.cc/VD4M-MGE7].

116. *See* A.B.A. STANDARDS & RULES OF PROC. FOR APPROVAL OF L. SCHS. § 308(a) (A.B.A. 2017-2018).

117. Participants in the former category may cause the course to qualify as a distance education course for purposes of American Bar Association accreditation. *See* A.B.A. STANDARDS & RULES OF PROC. FOR APPROVAL OF L. SCHS. § 306(c), (d) (A.B.A. 2017-2018) (establishing rules for distance education).

and virtual presence, which complicates the attendance-taking task. For these reasons, I do not use Zoom to track attendance or participation, though the software's capabilities certainly affect these tasks.

J. FEATURES AND FLEXIBILITY OVER THE LONG RUN

Many of Zoom's ancillary features complement and support in-person law school teaching. These features align with current values in law teaching, such as active learning, equity among students, and accessibility. Zoom, and other videoconferencing software, bundle these features into a coherent learning platform that lowers barriers to use. From this perspective, Zoom offers an opportunity to displace the bespoke approaches to classroom technology that often characterize higher education. Flexibility within bundled functionalities may serve instructors better than serial choices among single-purpose programs.

Zoom and its brethren will evolve over time, and these changes may benefit in-person instructional use of the software. At least in the pandemic's wake, the videoconferencing sector appears more innovative and competitive than the staid market for LMSs. As Zoom adds or modifies features, instructors can parse and integrate these refinements into their pedagogies.[118] Unlike freestanding classroom technologies, rollout is automatic and universal through Zoom's platform-like operation. To some extent, the structural linkages between physical classrooms and virtual spaces ensure the future of videoconferencing software, whatever that is, will map reasonably well onto in-person instruction.

IV. BUNDLING'S ADVANTAGES (AND DISADVANTAGES)

Instructors can leverage Zoom's infrastructure to introduce bundled features into their in-person classrooms. Common across contemporary videoconferencing software, this bundling of features brings advantages and disadvantages, some of which are unique to this Article's novel use case for videoconferencing software. After outlining three positive values that Zoom supports—flexibility, innovation, and equity—this discussion addresses Zoom's drawbacks regarding the overuse of technology, classroom participants' privacy, and instructors' control over content.

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118. *Cf.* Crawford & Simon, *supra* note 7, at 466 (noting faculty sentiments that "everyone needs to get up to speed with [videoconferencing] technology, full stop").

A. FLEXIBILITY

A central advantage to bundling is flexibility. Instructors can deploy multiple features in tailored and adjustable configurations as Zoom's features exist in a single software umbrella. Educators may use slides and polling during some class sessions and solicit students' textual responses through chat in others. Similarly, some courses are amenable to extensive use of instructional technologies, while others may benefit from recording for purposes of accessibility and accommodations. Finally, instructors' technology preferences may change over time.[119] Using a centralized in-person learning platform facilitates these changes. Since Zoom packages a range of features, instructor control is high, while switching and transition costs are low.

B. INNOVATION

By allowing instructors to make choices under constraints, Zoom's bundled features can promote classroom innovation.[120] Zoom's bundled interface creates a delineated menu of readily available instructional technologies.[121] These features fall into a limited number of top-line features, such as polling and digital whiteboards. Within each feature, Zoom typically provides an array of options, often available only to software administrators or through layered interfaces.[122] This structure lets instructors deploy a feature without requiring comprehensive knowledge of the feature. If additional customization is needed, instructors can dig into the application's options. Because instructors select preexisting features from Zoom's platform, barriers to adoption are relatively low, while retaining enough depth of choice to satisfy more complex needs. These conditions are ripe for instructor-driven pedagogical innovation, as well as student-led innovation in learning techniques.[123]

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119. The pandemic, for example, had significant effects on instructors' preferences for classroom technology.

120. This mechanism for innovation is well-traveled. *See, e.g.*, Morenike Saula, *Crisis-Induced Innovation in U.S. Legal Education*, 69 J. LEGAL EDUC. 679, 688 (2020) (describing the pandemic as leading to changes that "are essential, not only in a crisis, but for everyday living").

121. Menu design affects users' choices, which in turn affects outcomes. This "choice architecture" raises the stakes for how Zoom's interface presents to users on the instructional side. Presumably, Zoom optimizes its interface for videoconference users, rather than in-person teachers. *See, e.g.*, CASS R. SUNSTEIN, THE ETHICS OF INFLUENCE 159–86 (2016).

122. Zoom's options for customization seem to have grown as the pandemic has waned.

123. A comparison point might be LMSs, which tend to be underutilized in terms of their built-in features. My sense is that, in legal education, instructors use LMSs primarily to disseminate materials and make announcements. Some of this underutilization may be explained by the notorious complexity of LMSs' interfaces from instructors' perspectives.

C. EQUITY

When used in-person, Zoom sheds many of the equity-based concerns that militate against synchronous remote instruction.[124] Disparities in access to technology are minimized.[125] Internet connections are common and institutional, rather than contingent on each participant's circumstances.[126] Additionally, students can participate with nothing more elaborate than an internet connected device. If students' software or devices fail, they have recourse to the conventional in-person classroom.[127] Moreover, the in-person use of Zoom renders moot the need for private videoconferencing spaces; if the classroom's physical and virtual spaces are simultaneous and coextensive, privacy *vis-à-vis* other students is roughly equivalent to a fully in-person experience.[128] Other physical and psychological perils of sustained videoconferencing—like "Zoom fatigue"—have less relevance when the principal mode of interaction is not virtual.[129]

As equity concerns about remote learning recede, Zoom's equity-enhancing characteristics come to the fore.[130] In addition to built-in accessibility features, Zoom eases certain types of accommodations through *inter alia* its management of shared visuals and recordings. Zoom encourages alternative modes of communication with chat, hand-raising, and reactions. Furthermore, polling democratizes and decentralizes student input in classroom discussion. Zoom's flexibility, as a learning platform, facilitates midstream adjustments to meet student needs. Taken together, these features meaningfully promote educational equity.

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124. *See* Gangwar, *supra* note 97, at 521 (noting environmental and technological challenges that students faced during pandemic-driven emergency remote instruction); Graffy, *supra* note 2, at 56–58 (citing Internet connectivity, availability of private spaces, video etiquette, and technological competence as barriers to Zoom-mediated online instruction). *See also* Suter, *supra* note 96, at 683 (2021) (noting that some students "had to shift locales to get better internet signals").

125. *See* Colombo, *supra* note 6, at 902 (noting that, for synchronous remote instruction, "access to the necessary technology was a *sine qua non* of their enrollment").

126. If these connections fail, class can continue, minus Zoom's technological perks.

127. *See* Field, *supra* note 7, at 276 (arguing that "technological problems" are not "as problematic today after educators' and students' pandemic-induced crash courses with online learning tools").

128. *See* Crawford & Simon, *supra* note 7, at 456 (noting that "[m]any students reported that they did not have reliable internet and did not have any privacy at home"). Other variables, such as recording, would need to be the same with and without the Zoom component.

129. *See* Anna C.M. Queiroz et al., *Too Tired to Connect: Understanding the Associations Between Video-Conferencing, Social Connection and Well-Being Through the Lens of Zoom Fatigue*, 149 COMPUTS. IN HUM. BEHAV., Dec. 2023, at 2; *see also* Dutton & Mohapatra, *supra* note 4, at 483.

130. For a more detailed discussion of many of these characteristics, *see supra* Part II.

D. OVERUSE OF TECHNOLOGY

Concerns about digital technologies in law school classrooms are legion, notwithstanding the current prevalence of technology across higher education and legal practice.[131] By using Zoom as an in-person learning platform, instructors clearly concede the presence of technology in their classrooms—though, in the absence of categorical bans on technology, that concession frequently yields very little in a pragmatic sense. The remaining stakes involve who uses technology, how they use it, and whether students should have an option to eschew classroom technology.

Conventional classroom technologies in higher education tend to be controlled by faculty who set the content and pace of instruction. By contrast, when instructors and students log into Zoom from a physical classroom, they join a shared virtual space that may have more—or less—democratic permissions with respect to features such as screen sharing or direct messaging.[132] Here, instructors cede to students the use and some control of classroom technology. This change in authority, if pernicious, may prove hard to reverse.[133]

Conversely, students may feel obligated to use Zoom during class sessions, if instructors use the application as an in-person learning platform. Since Zoom bundles multiple classroom functionalities, students may feel greater pressure to adopt the software than standalone classroom technologies. Opting out has higher stakes. Although law schools typically require students to become proficient in out-of-class technologies, instructors often afford more flexibility in classrooms to accommodate students' learning preferences.[134] These concerns can be addressed by providing alternative means to participate. For example, students may submit a written record of their responses to in-class polls. The maxim that a menu for one party may prove restrictive for another represents a detriment that applies with particular strength to in-person use of Zoom as a learning platform.

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131. *See generally* Caron & Gely, *supra* note 19; Deborah J. Merritt, *Legal Education in the Age of Cognitive Science and Advanced Classroom Technology*, 14 B.U. J. SCI. & TECH. 39 (2008). *See* Friedland, *supra* note 40, at 230 ("The legal academy should not only use advancing technologies but also teach students how to use them.").

132. See *Restrict In-Meeting Features for Users Joining Meetings*, ZOOM SUPPORT (Apr. 23, 2024, 10:59 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0068023 [https://perma.cc/5UKQ-H8QT].

133. Alternatively, the democratization of classroom technology may have benefits.

134. For example, students often are required to take exams on computers and to register for classes through a web interface. And, of course, most legal research is conducted electronically.

E. PRIVACY

Zoom potentially can record all auditory or visual data that pass through its interface, therefore its use as a regular feature of in-person instruction presents privacy issues for both students and instructors.[135] From this perspective, the problem is not that Zoom records data.[136] Instead, the issue lies in the depth of data recorded; Zoom captures verbal transcripts (accurate or not), chat logs, polling responses, and oral conversations that are available from a centralized source.[137] An outside party could glean more from these materials than from a mere recording of video and audio. In this way, the privacy issues associated with in-person use of Zoom exceed those arising from conventional recording. This potential harm stems from Zoom's bundling function—the very aspect of Zoom that makes the software valuable as an in-person learning platform.

F. CONTROL OVER CONTENT

Zoom's use as an in-person learning platform also raises concerns about instructors' control over their course content.[138] As with privacy, one problem is that deployment of Zoom accrues more information about an instructor's teaching methods and content than conventional recordings. Instructors' proprietary course materials, however, likely remain relatively scattered across LMSs, cloud servers, and human brains. For this reason, Zoom's recording feature has greater implications from a privacy perspective than an intellectual property one.

Distinct from the problem of scope is the possibility that Zoom, as a third party to the instructor-institution relationship, will use classroom-derived data inappropriately. Although Zoom disclaims any use of its customers' videoconferencing sessions to train its artificial intelligence model, Zoom does employ and retain customer data for other purposes.[139] Over-retention of data, out-of-policy uses of information, and data security all present risks,

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135. Virtual interlopers also may threaten participants' privacy. These interlopers, however, can be excluded through various software-mediated techniques. *See How to Keep Uninvited Guests Out of Your Zoom Meeting*, ZOOM BLOG (Oct. 5, 2022), https://www.zoom.com/en/blog/keep-uninvited-guests-out-of-your-zoom-meeting/ [https://perma.cc/A3BP-PNS9].

136. For discussions of legal and nonlegal privacy considerations in the context of classroom recording, *see* Anderson, *supra* note 93, at 389–90; Dutton & Mohapatra, *supra* note 4, at 482–83.

137. All these items could be subject to FERPA protections that would require institutional management. *See* Family Educational Rights and Privacy Act (FERPA), 28 U.S.C. § 1232g.

138. For legal considerations about control over content by instructors and their institutions, *see* Anderson, *supra* note 93, at 394–96.

139. *See How Zoom AI Companion Features Handle Your Data*, ZOOM SUPPORT (June 11, 2024, 10:56 PM), https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0057861 [https://perma.cc/6E4U-9C98]; *Zoom Privacy Statement*, ZOOM (Mar. 17, 2024), https://explore.zoom.us/en/privacy/ [https://perma.cc/2NRX-KATT].

though these risks are perhaps no different from those inherent in other partnerships between higher education and technology providers. For this reason, these issues are best resolved within the larger conversions about instructors' intellectual property in higher education.

V. CONCLUSION

The pandemic spurred renewed interest across legal education in teaching and pedagogy, especially in the context of remote learning. This interest stemmed from instructors' access to various tools in videoconferencing software such as Zoom. This Article translates Zoom's toolbox to physical classrooms—a novel use case for Zoom and other videoconferencing software. As an in-person learning platform, Zoom offers a rich bundle of classroom-ready features through its ubiquitous, infrastructure-like interface. This coherent package offers many opportunities—as well as risks—to teachers of law in physical classrooms.