How the Process of Building Legal Technology Creates Professional Agility

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Abstract

As the legal and technology sectors continue to merge, the growing importance of applying technology to solve traditional legal problems cannot be overstated. Today's lawyers must possess not only substantive legal knowledge, but also a high level of technical sophistication and the desire and ability to embrace innovation.

Several U.S. law schools offer courses in which students apply substantive legal knowledge and analysis to build functional technologies intended for real world implementation for the benefit of self-represented individuals. These courses teach students about how technology functions, its role in narrowing the access to justice gap, and fulfill many pedagogic goals of the law school curriculum, including providing instruction in legal analysis. Equally important, hands-on technology courses also provide a natural context for students to engage in the self-regulated learning cycle of forethought, performance, and reflection, and thereby become active learners who graduate from law school secure in their professional identities and with the professional agility to innovate, adapt, and grow, not only on a personal level, but on a scale that has the potential to transform the practice of law.

This article demonstrates that the future of the legal profession will be shaped by lawyers with technical expertise who bring fresh perspectives sparked by exercising independent thought and strengthened by the fulfillment that comes from implementing a tangible work product designed to promote access to justice.

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Introduction

There are several law schools in the United States that offer classes in which students apply substantive legal knowledge and analysis to build functional technologies intended for real world implementation.[1] These courses make valuable contributions to the law school curriculum in several ways. They teach students how technology works, how technology interacts with the substance of the law, and how, when combined, technology and the law can be used to systematically address access to justice issues by creating new resources for self-represented individuals.[2] In addition, these courses

[1] A few of the prominent early players in this field include the Georgetown University Law Center, *Civ Tech: Digital Tools and Access to Justice Course* https://pitcases.org/2020/12/16/civ-tech-digital-tools-and-access-to-justice/ (last visited Feb. 28, 2021); Chicago-Kent College of Law, *Justice and Technology Practicum* https://www.kentlaw.iit.edu/courses/law-506-justice-and-technology-practicumhttps://www.kentlaw.iit.edu/courses/law-506-justice-and-technology-practicum (last visited Feb. 28, 2021); and Columbia Law School, *Lawyering in the Digital Age Clinic* https://www.law.columbia.edu/academics/courses/26784https://www.law.columbia.edu/academics/courses/26784 (last visited Feb. 28, 2021).

[2] In 2012, the American Bar Association amended the Model Rules of Professional Conduct to include a duty of technology competence and, as of the writing of this article, 39 states had followed suit. The topic of technology has since become an essential addition to law school curricula.

further teach law students to become self-regulated learners, a skill that will benefit them for the duration of their career as lawyers.

Self-Regulated Learning

Also known as "expert learning," the concept of self-regulated learning grew out of educational psychology literature. Over two decades ago, Professor Barry Zimmerman extolled the value of self-directed learning in an academic environment. He described self-regulated learning as, "a proactive activity" in which students experience learning as "something they do for themselves, rather than as something that is done to or for them," and thereby control their learning by setting goals, self-monitoring, and thinking strategically.[3]

Both the cognitivist and constructivist learning theory movements contributed to self-regulated learning methodology. Self-regulated learning is cognitive in that the students perform the task of storing and retrieving new learning and constructivist in that "students learn to create their own significance in the materials by drawing upon their own experiences and constructing interpretation accordingly."[4] Metacognition is the student's conscious awareness and understanding of their ability to monitor and control their own learning processes.[5] Metacognition is important because, ultimately, having a sense of control over one's learning heightens feelings of autonomy, as well as one's sense of competency, and eventually leads students to perform at a more expert level.[6]

The process of self-regulated learning was first applied in the context of the law school curriculum by Professor Michael Hunter Schwartz.[7] He observed several studies within and outside the context of legal education assessing the effectiveness of courses designed to teach self-regulated learning skills and noted the correlation between student success and self-regulatory behavior. He concluded that the benefit to law student performance in the classroom, on the bar exam, and in the practice of law could be significant and advocated for law schools to improve student

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[3] Barry J. Zimmerman, *Developing Self-Fulfilling Cycles of Academic Regulation: An Analysis of Exemplary Instruction Models*, *in* SELF-REGULATED LEARNING: FROM TEACHING TO SELF-REFLECTIVE PRACTICE 1 (Dale H. Schunk & Barry J. Zimmerman eds., 1998).

[4] Elizabeth M. Bloom, *Teaching Law Students to Teach Themselves: Using Lessons from Educational Psychology to Shape Self-Regulated Learners*," 59 WAYNE L. REV. 311, 316 (2013).

[5] *Id*. at 317.

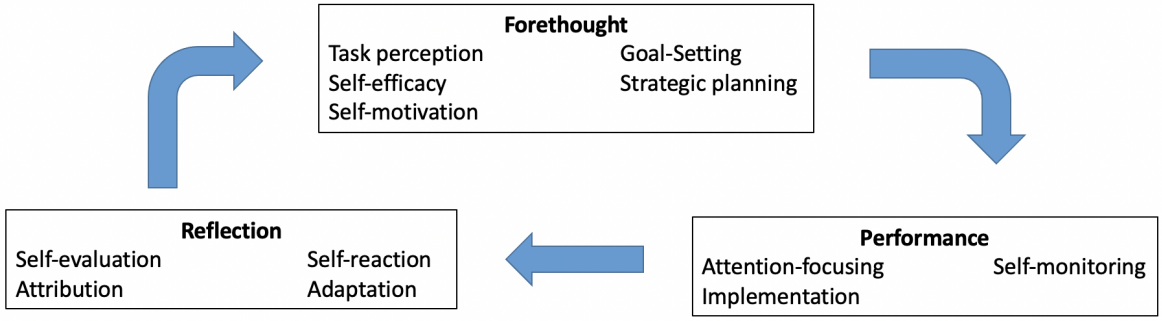
[6] *Id*. at 325.

[7] *See generally* Michael Hunter Schwartz, *Teaching Law Students to be Self-Regulated Learners*, 2003 MICH. ST. DCL L. REV. 447 (2003).

outcomes by proactively teaching self-regulated learning in their courses.[8] Most students do not become self-regulated learners without receiving explicit instruction in self-regulating strategies but, fortunately, such strategies can be taught in any type of classroom context.[9]

The self-regulated learning process is cyclical and includes three phases: forethought, performance, and reflection. Each phase includes multiple activities.

Figure 1. The Self-Regulated Learning Cycle[10]



The Forethought Phase

In the forethought phase, the student perceives a learning task and prepares to engage with it.[11] The activities in the forethought phase are conducted in a somewhat linear sequence, although more experienced self-regulated learners may combine activities or adjust the order based on their personal preferences.[12]

The student classifies the task by identifying the subject area of the task and the types of learning she will need to employ (such as recalling, analyzing, or problem solving) to complete the task.[13] She considers whether the task is of intrinsic interest to her and whether she finds it to be relevant based on the context of the course and her long-term educational goals.[14]

The student also assesses her self-efficacy – her personal estimation of her ability to complete the task. This involves recalling past experiences,

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[8] *Id*. at 483.
[9] *Id*. at 482.
[10] MICHAEL HUNTER SCHWARTZ, EXPERT LEARNING FOR LAW STUDENTS 30 (Carolina Academic Press ed., 2d ed. 2008); *see also*MICHAEL HUNTER SCHWARTZ, ET AL.,& TEACHING LAW BY DESIGN: ENGAGING STUDENTS FROM THE SYLLABUS TO THE FINAL EXAM 9 (Carolina Academic Press ed., 2d ed. 2017) (a later iteration).
[11] *Id*.SCHWARTZ, *supra* note 10, at 30
[12] *Id*.
[13] *Id*. at 36.
[14] *Id*. at 31.

weighing the difficulty of the task, and measuring her own skills.[15] Students with higher self-efficacy tend to perform better on tasks because their belief in their abilities enables them to persist through difficulties. This in turn increases their likelihood of success, which leads to greater future self-efficacy, thereby demonstrating the value of believing in one's skills.[16]

This is also the stage at which the student sets goals and outcomes for the task. Self-regulated learning strategies teach students to set mastery goals rather than performance goals.[17] Mastery goals focus on acquiring the skill or knowledge to the greatest extent possible; performance goals focus on meeting an external standard, such as earning a particular grade.[18] It is most productive to set goals that are mastery goals, have specific performance standards, are timely, concrete, and will require some stretching to achieve.[19]

The last step of the forethought phase is important because it involves creating and tailoring a strategic approach to achieving the student's goals and outcomes.[20] In this step, the student selects the strategies that they believe will lead to success, while considering their own learning preferences, the potential outcomes of the strategies and, from a practical standpoint, how the student best learns, such as by controlling their physical learning environment.[21]

The Performance Phase

Next, the student systematically implements the learning strategies they selected in the forethought phase to complete the performance phase. The steps of the performance phase, attention-focusing, implementation, and monitoring, are not linear and instead are best visualized as a Venn diagram.[22] At this stage, the student engages in various attention-focusing strategies, such as finding motivation, controlling feelings of inadequacy, anxiety or, in other instances, over-confidence, and minimizing distractions.[23]

Self-monitoring one's progress is important to the success of this phase.[24] What a student specifically monitors is based upon their individual goals, but in general it involves monitoring whether their strategies are actually proving to be effective and whether the work is proceeding in a timely manner.[25]

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[15] *Id*.
[16] SCHWARTZ, ET AL., *supra* note 10, at 9.
[17] Schwarzt, *supra* note 10, at 31.
[18] *Id*.
[19] *Id*.
[20] *Id*.
[21] *Id.* at 31-32.
[22] *Id.* at 67.
[23] *Id.* at 32.
[24] *Id.*
[25] *Id.*

It can additionally be helpful to engage in one or more cognitive strategies throughout this phase.[26] A cognitive strategy is a technique for producing learning. Familiar examples include using flashcards, mnemonics, graphic organizers, or outlines.[27] Students who are taught to use self-regulated learning not only develop cognitive learning strategies, but they internalize these skills in such a way that they can later apply them in a "wide variety of contexts."[28]

The Reflection Phase

The reflection phase occurs immediately after the work is completed and serves to guide the student in future learning endeavors.[29] As the student looks back upon her efforts, she considers whether they were effective by comparing her performance with a standard. The standard may have been set by the student's objectives or the professor's objectives.[30]

The student identifies attributions to determine why she did or did not meet the standard. An attribution is the student's own explanation for why she performed well or poorly.[31] This activity is very important because it influences how the student is likely to handle similar tasks or learning in the future. Students who have been taught to be self-regulated learners and who take control of their learning are much more likely to attribute failures to reasons that can be corrected, such as neglecting to put forth enough effort, and to attribute success to personal ability.[32] As a result, self-regulated learners are more likely to experience positive self-reactions and, in the future, to continue to try if at first they fail, whereas students who have not become self-regulated learners may be more likely to give up.[33]

What a student identifies as her attributions will in turn influence her adaptations. Adaptations are the modifications students make to future strategies based upon their experiences.[34] Students who understand that multiple iterations of a strategy, or that a change in strategy altogether may be what is necessary to succeed, are more adaptive than students without self-regulating skills.[35]

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[26] Schwartz, *supra* note 7, at 459.
[27] Schwartz, *supra* note 10, at 49.
[28] Schwartz, supra note 7, at 460.
[29] Schwartz, *supra* note 10, at 33.
[30] *Id*.
[31] *Id*.
[32] *Id*.
[33] *Id*.
[34] *Id*.
[35] *Id*.

Self-Regulation and the Formation of Professional Identity

Appreciation for the value of teaching self-regulated learning in law schools grew, in part, out of the recent Humanizing Legal Education Movement.[36] This movement challenged law schools to rethink their curricula in order to foster psychological maturity in students and empower them to draw upon internal, rather than external, motivations.[37] Its goal is to instill a growth mindset in students in which new and challenging tasks are welcome and failure is simply seen as an opportunity to improve.[38] It incorporates an understanding of human nature that maximizes meaning, well-being, and encourages intrinsic values.[39]

Self-regulated learning supports the humanizing movement because it is key to empowering students to take control of their learning, see the bigger picture, and create a vision for how to conduct their professional lives. These traits inherently contribute to the formation of students' professional identities.[40] Professor E. Scott Fruehwald distinguishes professional identity from the ethical rules of professional conduct and from the ability to act in a professional manner. It is instead, "a lawyer's personal legal morality, values, decision-making process, and self-consciousness in relation to the practices of the legal profession."[41] It involves cultivating one's professional identity and nurturing one's self-consciousness and constructive introspection, together with a sense of respect and responsibility toward others.[42] Importantly, "individual agency is the key to professional identity," and it is dependent upon "internal beliefs and standards" that inform the way a lawyer sees their role relative to other stakeholders in the legal profession.[43]

The self-regulated skills of self-monitoring, setting goals, strategizing, and reflecting are crucial to the development of a student's

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[36] *See* Michael Hunter Schwartz, *Humanizing Legal Education: An Introduction to a Symposium Whose Time Came*, 47 WASHBURN L. J. 235 (2008).
[37] Elizabeth Adamo Usman, *Nurturing the Law Student's Soul: Why Law Schools are Still Struggling to Teach Professionalism and How to do Better in an Age of Consumerism*, MARQ. L. REV. 1021, 1055 (2016) (referencing clinical psychologist Abraham Maslow's work on personal maturity).
[38] *Id*. at 1063 -1064. (Drawing on Carol Dweck's Mindset Theory, which avers that "a person's belief about whether intelligence is fixed or fluid influences how that person reacts to (and defines) failure.").
[39] Bloom, *supra* note 4, at 325.
[40] Larry O. Natt Gantt, II & Benjamin V. Madison, III, *Self-Directedness and Professional Formation: Connecting Two Critical Concepts in Legal Education*, 14 U. ST. THOMAS L. J. 498, 514 (2018).
[41] E. Scott Fruehwald, *Developing Law Students' Professional Identities*, 37 U. LAVERNE L. REV. 3, 3 (2015).
[42] *Id*.
[43] *Id*.

professional identity because they enable the student to see herself as an actor with different alternatives.[44] Furthermore, students who are able to achieve this level of personal agency discover that knowledge is no longer the property of professors or experts, but that it is instead "constructed through experience, reflection, and analysis."[45] At this stage, the student's control of their learning allows them to engage in critical reflection of the legal system, including their personal role within the system and how their values interact with those of the system.[46] The ability to engage in systemic critiques of the law in turn creates lawyers who can think outside the "constraint of tradition" and potentially change the discourse about law's systemic roles in society.[47]

Courses in which Law Students Build Technology

Courses in which law students build technology are designed for students who are interested in the intersection of the law and technology and have a desire to do work that promotes access to justice. Whether taught as a classic course, a clinic, or a lab, these courses typically share a similar structure in which students engage in a seminar component, draft a scope document, conduct research and write a memorandum, create a storyboard, build the technology, conduct user testing, and engage in reflection.[48]

In the seminar component, students complete readings and engage in discussions about the justice gap that persists in our country.[49] Within this context, the students consider the individual and collective power of technology to bridge the gap. Around the world, people use their phones, tablets, laptops, and the power of the internet to access resources that would otherwise be unavailable to them. The access to justice movement is making the most of this opportunity by creating hands-on law school courses in which students build legal applications meant for real-world adoption in many areas

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[44] Schwartz, *supra* note 7, at 467.
[45] Fruehwald, *supra* note 41, at 9.
[46] *Id.* at 10.
[47] *Id.* at 10.
[48] *See* Symposium, *Justice, Lawyering and Legal Education in the Digital Age*, 88 CHI.-KENT L. REV. 687 (2013) (examining five courses in detail in which students build technology for justice); The Center for Computer-Assisted Legal Instruction, *A2J Author Course Kit*, https://www.a2jauthor.org/sites/default/files/A2J_Author_Course_Kit-May18.pdfhttps://www.a2jauthor.org/sites/default/files/A2J_Author_Course_Kit-May18.pdf.
[49] Ronald W. Staudt and Andrew P. Medeiros, *Access to Justice and Technology Clinics: A 4% Solution*, 88 CHI-KENT L. REV. 695, 713-715 (2013) (noting the lack of capacity among Legal Services Corporation funded legal aid offices and observing that, "every serious study of the legal needs of the poor shows that eighty percent of these needs go unmet.").

of law.[50] These applications are generally designed to improve access to the legal system, often through the use of online guided interviews, document assembly, and the automation of processes.[51] Opportunities for legal applications to help the underserved are limitless.

The learning that occurs throughout a legal technology course follows a cycle equivalent to that of the self-regulated learning process and may be overlaid onto the three phases of forethought, performance, and reflection.

The Forethought Phase in a Legal Technology Course

At the outset of a legal technology course, the students engage in significant forethought. They perceive the requirements of the course and understand that they will have to master a substantive area of the law, learn new software, accurately and effectively convey the meaning of the law through the software, and produce a tangible, functioning work product.

Legal technology courses frequently partner with community organizations, such as legal nonprofits, to build technology that will be actively deployed. Students in the legal technology class meet with the community partner at the outset of the semester and, together, identify a project that will be of use to the partner, will serve a specific need in the local community, and is of intrinsic interest to the students. The community partner and the students share a mutual goal – the community partner will receive a functional tool and the students will gain substantive knowledge of a specific area of law, as well as the practical experience that comes from analyzing and communicating the law via a technical application.

As the students assess their self-efficacy, they realize that, although they come to the table with some knowledge and skills from their prior law school studies, there are additional proficiencies they will need to acquire in order to complete the course. First, the students often need to deepen their

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[50] Examples include apps that provide assistance for migrant farm workers in the U.S., https://georgetown.neotalogic.com/a/trlalivehttps://georgetown.neotalogic.com/a/trlalive (last visited Feb. 28, 2021)(Follow the queries to experience the web application and the results it offers.); assistance with determining one's eligibility for expungement in Middle Tennessee and the Cumberlands, https://georgetown.neotalogic.com/a/lasexpungementadvisor (last visited Feb. https://georgetown.neotalogic.com/a/lasexpungementadvisor (last visited Feb. 28, 2021)(Follow the queries to experience the web application and the results it offers.), and assistance with submitting insurance claims in Australia: https://educationau.neotalogic.com/a/dashboardhttps://educationau.neotalogic.com/a/dashboard (last visited Feb. 28, 2021)(Follow the queries to experience the web application and the results it offers.).

[51] Examples of software used in these courses include A2J Author, https://www.a2jauthor.org/https://www.a2jauthor.org/ (last visited Feb 28, 2021); Neota Logic, https://www.neotalogic.com/https://www.neotalogic.com/ (last visited Feb. 28, 2021); and Docassemble, https://docassemble.org/https://docassemble.org/ (last visited Feb. 28, 2021).

understanding of the substantive and procedural law involved in the project. They therefore draw upon their first-year writing and research classes to conduct research and a draft memorandum setting forth the relevant legal information. Ideally, this step also includes observing relevant court processes and conducting in-depth interviews with lawyers who serve as subject matter experts in the relevant practice area, which serves to educate the students about any customs in local legal practice. Students share their memorandum with the community partner, who verifies the accuracy of the students' understanding of the legal and procedural information.

Next, as part of their early semester learnings, the students are instructed in the importance of conveying the law in plain language so that it is clear and understandable to the average person. This means translating the law to a fifth-grade reading level. Students often overestimate their ability to translate the law in plain language and the course therefore extensively engages them in plain language exercises with the goal of improving their skills in conveying information that is free of legalese and terms of art.[52]

Finally, students receive formal training in the software they will use to build the technology and they are given personal access to the software to begin exploring within it. All of these activities are designed to bolster the students' self-efficacy and boost their psychological state at the outset of the project.

To conclude the forethought phase, the students engage in goal setting and strategic planning by creating a scope document. The scope document identifies and classifies the tasks that must be completed throughout the semester to complete the project. Additional purposes of the scope document are to define the boundaries of the project and set forth mastery goals for the project. It identifies concrete steps for how the work will be done, timely deadlines for each step, and the means by which the students, the instructor, and the community partner will measure success. While realistic, the goals (such as mastering a targeted area of the law and learning a new software) are substantial and challenge the students to work hard. The document also includes some practical, environmental and motivational strategies. For example, the students may identify particular points in the semester at which they will work as a group so that they can share the burden and capitalize on one another's strengths and other times when it will be more productive to work individually.

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[52] *See* John C. Kleefeld and Katelyn Rattray, *Write a Wikipedia Article for Law School Credit – Really?* 65 J. of LEGAL EDUC. 597, 606 - 607 (Spring 2016) (advocating for the benefits of training students to explain technical concepts in plain language and observing that giving students the opportunity to compose in a multimedia environment "enhances notions of audience, purpose, genre, form, and context.").

The Performance Phase in a Legal Technology Course

The students launch the performance phase of the self-regulated learning cycle by creating a storyboard and/or a design document. The storyboard is a graphical or written flowchart representing the information gathering process that will take place within the legal application they are building.[53] A design document sets forth the conclusions the system will reach, the rules governing those conclusions, the relevant facts, and the outputs the system must produce.[54] After several iterations, these materials enable the students to master the logic behind the legal processes and properly organize the information being gathered in the application. For example, in a course in which students are building an online guided interview meant to collect information to populate an automated court form, the storyboard sets forth the most logical sequence for the questions, bearing in mind that the questions in the original print document may not have been set forth logically. These materials also set forth the plain language the students have written for each step of the process.

Implementation occurs when the students build the technology. Using the storyboard and design document as cognitive strategies, students develop the application in the software. Although each part of the technology should be well-designed, [55] easy for end-users to navigate, and provide the just-in-time instruction needed to understand the process, this is not simply a technical exercise. Building legal technology teaches students to "'decompose' routine and repetitive legal tasks," break them into component parts, and apply the technology to as many parts as possible.[56]

Throughout the performance phase, the students engage in ongoing self-monitoring, including tracking whether the personal and course-specific strategies they set forth in the scope document are proving to be effective, whether they are meeting their deadlines, and whether they are meeting the common goals they identified with the community partner. They keep each other focused and on-task by holding each other accountable for their share of the work, adjusting expectations, and helping as needed. They also receive

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[53] Staudt & Medeiros, *supra* note 49, at 714 (describing the contents of a storyboard in the context of a legal technology class).

[54] Tanina Rostain, Roger Skalbeck, & Kevin G. Mulcahy, *Thinking Like a Lawyer, Designing Like an Architect: Preparing Students for the 21st Century Practice*, 88 CHI-KENT L. REV. 743, 747 (2013) (setting forth best practices for drafting a design document).

[55] For a thoughtful discussion of the design process in legal technology education, *see* Dan Jackson, *Human-Centered Legal Tech: Integrating Design in Legal Education*, 50 LAW TCHR 82 (2016).

[56] Chancellor John Pierre and Robert Furnier, *The SULC Urban Law, Technology, & Research Academy Initiative*, 50 U. TOLEDO L. REV. 315, 317 (2019) (invoking legal futurist Richard Susskind).

regular, ongoing feedback from the instructor and the community partner to monitor and maintain the accuracy of the substance of their work.

It is at the intersection of the Venn diagram that comprises the performance phase of the self-regulated learning cycle where the students see the law in action – they observe how one procedural step leads to the next, they address how the law applies to different factual scenarios, and they anticipate the needs of their users in exhaustive detail. The students learn to "think about legal regimes as systems" that may be powerful or inadequate, and it is in this process that in-depth learning occurs.[57]

The Reflection Phase in a Legal Technology Course

The students engage in several forms of reflection in the later half and end of the semester. First, they conduct self-evaluation by comparing the results of their work with a standard. The students were tasked with building a functional legal application that conveys accurate legal information and is ready for real-world adoption. To determine whether they have met this standard, the students conduct "think aloud" user testing. In this process, attorneys and nonlawyers with various educational, class, language, and cultural backgrounds serve as users of the product to test every possible path in the software in order to review the language for clarity and accuracy and to review the app itself for functionality. The students observe the process, and the testers share their thoughts out loud in a steady stream of consciousness so that the students may identify where a step is unclear or inaccurate, where the software malfunctions, or any other places where there is need for improvement.

Even when user testing reveals flaws or errors, the students' self-reactions remain positive and their emotions remain high because they are heartened by the fact that they are building a useful resource for the local community. The fact that the students can see how this product will help people in need of legal assistance makes them feel excited and unfazed by what they might have gotten wrong along the way. Instead, they are energized to persist in their work.[58]

After making the necessary corrections and revisions discovered during the user testing process, the students make a formal presentation to the

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[57] *See* Rostain et al., *supra* note 54, at 746-747, 749-751 (discussing the pedagogic value of building legal applications in the law school setting, including the teaching of legal and factual analysis); and *see* Staudt & Medeiros, supra note 49, at 713-715 (also discussing the pedagogic value of building legal applications in the law school setting, including legal project management and planning).

[58] *See* Kleefeld & Rattray, *supra* note 52, at 621 (observing that, "the sense of ownership students obtain by seeing their work 'go live' is a great satisfaction that they can carry throughout the project.").

community partner to deliver their work product. At this time, students must be prepared to face substantive and practical questions from all stake-holders present, which presents another opportunity for the students to engage in self-reflection.

Finally, the students write a memorandum at the end of the semester in which they personally evaluate the quality of their work product and reflect upon their learning experience. The most common feedback they provide is that this course is unlike any other they have taken in law school and that the context of building hands-on technology taught them to see the law in a new light, particularly as it impacts unrepresented individuals.

These many forms of engaging in reflection to identify attributions are crucial to the students' future learning. The process of using software to build legal technology is a practical one and it makes it relatively straightforward to look back at one's work and determine where something went awry. For example, the programming logic might have been flawed. Or, the tester may have misunderstood what was asked when they read a particular question and therefore the language needed clarifying. Or, when the software set forth the law in a certain sequence, it changed the tester's understanding of the meaning such that it was no longer accurate, and the students therefore needed to reprogram the software logic. These are real, concrete results that allow the students to properly attribute why something went wrong, rather than simply attributing their mistakes to a lack of competence. In other words, students are accurately able to identify their strengths and weaknesses, such as whether they need to improve their understanding of the law, improve their written communication, or improve their technical skills.

The students' attributions lead to myriad adaptations. Students are better prepared in the future to define the scope of their work, create goals, conduct legal research and writing, employ heightened logical reasoning, communicate in plain language, meet deadlines, collaborate, manage a project, and evaluate outcomes through testing and analytics. Equally important, these courses also lead to greater adaptations in which students reconsider what it means to be an effective lawyer. For example, the necessity to convey the law in plain language highlights the difficulty nonlawyers encounter when trying to independently read and understand the law. The students realize that they, as lawyers, will need to do a better job of communicating clearly. Similarly, automating legal documents highlights how difficult they can be to understand and how something as simple as improperly completing a form contributes to the justice gap. As the students struggle to understand exactly what a form is asking and why, they come to realize that people who are without resources to help them complete legal

forms are likely to do so incorrectly and, as a consequence, are unlikely to be heard in court, simply because they cannot afford a lawyer.

Finally, the students come to understand how technology works and how it can be systematically applied to address legal problems. This adaptation is crucial as the legal and technology sectors continue to merge and there are a growing number of "legal questions that either require technical knowledge or for which some level of technical sophistication is extremely helpful."[59] In fact, technical expertise is so important as to rise to the level of "a prerequisite, a functional necessity, or at the very least a significant advantage to solving traditional legal problems."[60] Traditional legal work can be more efficiently produced through processes that employ technology, design, and novel delivery methods, and there is an important role for tech savvy lawyers in policy making as "many contemporary policy debates turn on technical questions."[61] To be successful in the future, lawyers will have to employ entrepreneurial mindsets that embrace technological innovation.[62]

Creating Professional Agility

The adaptations students gain by engaging in self-regulated learning in a legal technology class are powerful because they influence not only how the students will approach their future learning endeavors, but also how see their role as lawyers in our world.

The primary components of developing one's professional identity are metacognition, self-regulation, and self-efficacy.[63] Metacognition includes declarative knowledge – knowing about things, procedural knowledge – knowing how to do things, and conditional knowledge – applying strategies at the appropriate time and place and for the right reason.[64] Through self-regulation, students use metacognition to become engaged thinkers who deliberately implement strategies to master their learning, regularly self-reflect upon their experiences, skills, and values, manage their

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[59] Daniel Martin Katz, *The MIT School of Law? A Perspective on Legal Education in the 21st Century*, 5 U. of ILL. L. REV. 1431, 1468 (2014).
[60] *Id*. at 1460.
[61] *Id*. at 1468 (advocating for preparing students for "emerging jobs that exist at the interaction of law and technology, including positions in legal project management, legal process engineering, and legal analytics." *Id.* at 1460).
[62] *Id*. at 1463 (noting that, "[f]or a growing number of employment opportunities, legal expertise may simply not be enough . . . [t]hose who can blend their legal training with other useful skills are likely to do quite well.").
[63] Fruehwald, *supra* note 41, at 4.
[64] *Id*. at 4-5.

emotions, and create internal motivations.[65] This in turn builds optimism, resilience, and the ability to persist.[66]

Students who graduate from law school secure in their professional identities and skilled in navigating the self-regulated learning cycle will have the professional agility to innovate, adapt, and grow, not only on a personal level, but on a transformative scale as they embrace technology as a systematic solution to the challenges posed by the justice gap. The future of the legal profession will be shaped by lawyers who bring new ideas sparked by exercising independent thought and strengthened by the fulfillment that comes from building and implementing a tangible work product designed to promote access to justice.

Conclusion

Courses in which law students build legal technology not only serve traditional pedagogic teaching objectives such as teaching legal analysis, they also have important benefits that are less apparent. Law students who build legal technology learn to view the world through the eyes of low-income and self-represented litigants. They become familiar with the obstacles barring access to information and they understand how technology can be systematically applied to address a widespread problem. In addition, they become self-regulated learners with the professional agility to be leaders in questioning the status quo, using logic and analytics to determine the best path forward, identifying efficiencies, and employing technology to drive functional change.

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[65] *Id.* at 5-11.
[66] *Id*. at 14-15.