INVISIBLE HANDS AND THE TRIPLE (QUADRUPLE?) HELIX DILEMMA: HELPING STUDENTS FREE THEIR MINDS

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INTRODUCTION

Legal education should be liberating, and legal research classrooms and law libraries can be sites of liberation. They can be places where students discover the potential to oversee their own development, both professional and personal. They can be places where students see the possibilities in their world and envision themselves as agents of social change. They can be places where students discover their roles as lawyers and the potential to change the law itself. One way to foster liberatory thinking is through critical information literacy.

Students engaged with critical information literacy can develop a critical consciousness about legal information. They can question and critique the social, economic, and political forces that shape legal information. They can see past claims of neutrality and objectivity and understand legal information as a social construct, created by the "invisible hands"[1] that create, organize, and sell it. They can, in short, free their minds.

I. THE TRIPLE HELIX DILEMMA

One area where students should focus their critical consciousnesses is the legal classification regime. That is, the classification, organization, and retrieval systems that enable efficient, easy legal research, but also bind researchers to predetermined ways of thinking,[2] place a "conceptual lock" on their minds,[3] and limit them to a "world of thinkable thoughts."[4]

Critical attention to legal classification systems is not new. In their seminal 1989 article, Professors Richard Delgado and Jean Stefancic drew from Critical Race Theory to examine the major legal information classification systems (the Library of Congress Subject Headings, the legal periodical indexes, and the

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[1] Like Adam Smith's "invisible hand of the market," invisible hands can shape society in unintended and undesirable ways.

[2] Richard Delgado & Jean Stefancic, *Why Do We Tell the Same Stories?: Law Reform, Critical Librarianship, and the Triple Helix Dilemma*, 42 STAN. L. REV. 207, 217 (1989).

[3] Jill Anne Farmer, *A Poststructuralist Analysis of the Legal Research Process*, 85 LAW LIBR. J. 391, 402 (1993).

[4] Robert C. Berring, *Legal Research and the World of Thinkable Thoughts*, 2 J. APP. PRAC. & PROCESS 305 (2000).

West Digest System).[5] In doing so, they highlighted a problem they termed the "triple helix dilemma."[6] Delgado and Stefancic argued that the "triple helix dilemma" occurs because the major classification systems are at once powerful tools for the researcher, and yet they also "function rather like molecular biology's double helix" to "replicate preexisting ideas, thoughts, and approaches."[7] Far from being neutral or objective, classification systems can shape and constrain thought, reinforce dominant paradigms, and stifle creativity and innovation. The "triple helix" tugs "the researcher toward the familiar, the conventional," thus precluding legal arguments that are born out of originality and inventiveness.[8] As Delgado and Stefancic so poetically put it, "We never realize that we cannot embark on certain types of journeys armed only with conventional maps."[9]

II. THE FOURTH STRAND—ALGORITHMS AND ARTIFICIAL INTELLIGENCE IN LEGAL RESEARCH DATABASES

Delgado and Stefancic conceived the metaphor of the "triple helix" at the "dawn of the computer revolution."[10] Since then, so much has changed. Personal computers, iPads, iPhones, and apps have been folded into every researcher's arsenal. In addition to catalogs, classifications, taxonomies, and indexes, legal research tools are powered with algorithms, machine learning, and artificial intelligence—many of which incorporate the classification systems they seem to have eclipsed. The workings of these algorithm-based tools remain opaque to most researchers, and yet, they shape everything the researcher discovers. In an article published almost two decades after their seminal article, Delgado and Stefancic revisited the "triple helix" and explored the dilemma in the context of computer-assisted legal research.[11] At that time, they warned that "[a] computer is good at showing you what is. It cannot show you what might be."[12]

At first glance, claims that technology is objective and neutral seem legitimate. After all, what could be more neutral than a machine? However, scratch the surface, and there is much more to consider.

First, the algorithms and artificial intelligence that power legal research databases do not necessarily dispense with the classification and indexing schemes that constitute the "triple helix." In her article advocating for more algorithmic accountability from legal research databases, Professor Susan Nevelow Mart notes that "Westlaw's algorithm uses value-added content such

[5] Delgado & Stefancic, *supra* note 2.

[6] *Id.* at 217.

[7] *Id.*

[8] *Id.* at 222.

[9] *Id.*

[10] Richard Delgado & Jean Stefancic, *Why Do We Ask the Same Questions? The Triple Helix Dilemma Revisited*, 99 LAW LIBR. J. 307, 309 (2007).

[11] *Id.*

[12] *Id.* at 328.

as the human-generated Key Number System, notes of decisions and headnotes, and KeyCite's citation networks"[13] and that "LexisNexis's algorithms utilize a topical classification system that it has been refining with machine learning since 1999."[14] In addition, she notes that "the West classification system and the LexisNexis classification system reflect a nineteenth-century worldview."[15] Thus, at least some of the classification schemes that Delgado and Stefancic worried about in their 1989 article have been "baked into" the algorithms we use today.

Second, legal research algorithms and artificial intelligence use "crowdsourcing" technology. "Crowdsourcing" technology keeps track of past user actions such as "view," "print," "save," and "folder" and uses that information to inform future search results and search rankings.[16] In his article examining WestlawNext, Professor Ron Wheeler finds that "[m]ost of the time, the vetting of results via a crowdsourcing algorithm will produce a result that is desirable and useful for a researcher."[17] However, the same algorithm may obscure "the less popular result, the most esoteric tidbit of legal information, or the item that has not been viewed, printed, saved, or put in folders by members of the crowd."[18] Thus, researchers who "write about changing the law or the effects of proposed changes" will not find the most useful or desirable results within the crowdsourced results.[19] Similarly, Professor Nicholas Stump finds that crowdsourcing technology "is an agent of homogenization for research outcomes."[20] The implications of these homogenizing effects can be profound. In his discussion of crowdsourcing technology, Nicholas Mignanelli asks, "What can we expect but for the crowd to imprint its biases on the historical data it creates?"[21]

Third, research has shown that algorithms and artificial intelligence are biased. Several scholars have investigated the role of algorithms and artificial intelligence in replicating historically based bias. Professor Zeynep Tufekci writes: "Algorithms that make decisions open up the same host of questions we have for humans making decisions: transparency, accountability, discrimination,

[13] Susan Nevelow Mart, *The Algorithm as a Human Artifact: Implications for Legal [Re]Search*, 109 LAW LIBR. J. 387, 400 (2017).

[14] *Id.* at 416.

[15] *Id.* at 418.

[16] Ronald E. Wheeler, *Does WestlawNext Really Change Everything? The Implications of WestlawNext on Legal Research*, 103 LAW LIBR. J. 359, 365 (2011).

[17] *Id.*

[18] *Id.* at 366.

[19] *Id.*

[20] Nicholas F. Stump, *Following New Lights: Critical Legal Research Strategies as a Spark for Law Reform in Appalachia*, 23 AM. U. J. GENDER SOC. POL'Y & L. 573, 611 (2015).

[21] Nicholas Mignanelli, *Critical Legal Research: Who Needs It?*, 112 LAW LIBR. J. 327, 340 (2020).

error, and so forth."[22] Cathy O'Neil found that math-powered applications are based on models that "encoded human prejudice, misunderstanding, and bias."[23] Professor Safiya Umoja Noble coined the phrase "algorithmic oppression" to describe the ways in which search engine results replicate structural racism and sexism.[24] She writes, "Part of the challenge of understanding algorithmic oppression is to understand that mathematical formulations to drive automated decisions are made by human beings. While we often think of terms such as 'big data' and 'algorithms' as being benign, neutral, or objective, they are anything but."[25] As such, the implications of search results are profound. She continues, "Search does not merely present pages but structures knowledge, and the results retrieved in a commercial search engine create their own particular material reality."[26]

Legal research systems such as Westlaw, Lexis, Fastcase, Ravel, Google Scholar, and Casetext are not immune to the influence of their human creators. Nevelow Mart has done research on the extent of human influence within those legal research systems and found that the effects are profound.[27] Further, these algorithms both conceal the legal research process and help entrench societal bias.[28]

In his 1987 article on legal research, Professor Steven Barkan asked, "Will artificial intelligence reify categorical schemes even more, permitting us to find only what artificial intelligence shows us?"[29] The answer seems to be "yes."

III. INVISIBLE HANDS AND THE QUADRUPLE HELIX

One way in which both classification systems and algorithms maintain their conceptual hold on legal information is by obscuring human influence. Traditional classification systems are historically rooted and thus seem neutral or objective. An interface used with algorithms and artificial intelligence "presents an information reality while the operations are rendered increasingly invisible."[30] Under this paradigm, it seems like information is stored, organized, arranged, and returned objectively, and the researcher's job is to retrieve that information.

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[22] Zeynep Tufekci, *Algorithmic Harms Beyond Facebook and Google: Emergent Challenges of Computational Agency*, 13 COLO. TECH. L.J. 203, 216-17 (2015).

[23] CATHY O'NEIL, WEAPONS OF MATH DESTRUCTION: HOW BIG DATA INCREASES INEQUALITY AND THREATENS DEMOCRACY 3 (2016).

[24] *See* SAFIYA UMOJA NOBLE, ALGORITHMS OF OPPRESSION (2018).

[25] *Id.* at 1.

[26] *Id.* at 148.

[27] Nevelow Mart, *supra* note 13, at 416.

[28] Mignanelli, *supra* note 21, at 340.

[29] Steven M. Barkan, *Deconstructing Legal Research: A Law Librarian's Commentary on Critical Legal Studies*, 79 LAW LIBR. J. 617, 636 (1987).

[30] UMOJA NOBLE, *supra* note 24, at 147-48.

Human choice, human bias, human judgment—these are rendered invisible to the researcher. There are "invisible hands" that do so much of the classification and algorithmic work. Humans at the Library of Congress create and maintain Library of Congress Subject Headings while human catalogers decide which headings to apply.[31] Humans at Westlaw create and maintain the Topic and Key Number taxonomy and decide how to organize West headnotes. Countless software developers, engineers, and programmers design and develop the algorithms and artificial intelligence systems that power our legal research platforms. All of these "invisible hands" shape the way in which information is received and perceived.

IV. MAKING INVISIBLE HANDS VISIBLE THROUGH CRITICAL INFORMATION LITERACY: INQUIRY, DIALOGUE, AND PROBLEM-POSING IN THE CLASSROOM

Can we "break the cycle" of the quadruple helix? Can we free ourselves and our minds from these invisible hands? Migananelli points to pedagogy, urging research librarians to "use our pedagogy to instill in our students a healthy dose of skepticism about claims of objectivity and neutrality."[32]

Critical information literacy is a pedagogical approach that reveals the "invisible hands" that shape the information environment. Although there is no single accepted definition of critical information literacy, it is generally understood to be the application of critical pedagogy to information literacy.[33] Unlike traditional information literacy, critical information literacy "refers to a frame of reference for consuming information or a type of critical thinking."[34] It is a way of thinking that considers the social construction and political dimensions of information.[35]

It is a student-centered model, urging students to "take control of their lives and their own learning to become active agents, asking and answering questions that matter to them and to the world around them."[36] With these types of attitudes and mindsets, students can begin to see the hands that are active in creating legal research tools.

Delgado and Stefancic focused on "inquiry" as a means to curtail the effects of the "triple helix." They found that in order to break the cycle of the "triple

[31] Grace Lo, *"Aliens" vs. Catalogers: Bias in the Library of Congress Subject Heading*, 38 LEGAL REFERENCE SERVS. Q. 170, 171-74 (2019).

[32] Mignanelli, *supra* note 21, at 342.

[33] Eamon Tewell, *A Decade of Critical Information Literacy*, 9 COMM. INFO. LITERACY 24, 25 (2015).

[34] Nicole A. Cooke, *Critical Literacy as an Approach to Combating Cultural Misinformation/Disinformation on the Internet*, *in* INFORMATION LITERACY AND LIBRARIES IN THE AGE OF FAKE NEWS 36, 45 (Denise E. Agosto ed., 2018).

[35] Eamon C. Tewell, *The Practice and Promise of Critical Information Literacy: Academic Librarians' Involvement in Critical Library Instruction*, 79 COLL. & RES. LIBR. 10, 11 (2018).

[36] James Elmborg, *Critical Information Literacy: Implications for Instructional Practice*, 32 J. ACAD. LIBRARIANSHIP 192, 193 (2006).

helix," researchers should inquire into the conceptual framework presented by the "triple helix." They wrote: "We may then inquire whether that framework is the only, or the best means of doing so. We may turn that system on its side and ask what is missing."[37]

In line with Delgado and Stefancic's focus on inquiry, critical information literacy often incorporates a method commonly called the "problem-posing" method.[38] Developed by Brazilian educator Paulo Freire in his 1970 book *Pedagogy of the Oppressed*, "problem-posing" aims to counteract what Freire characterized as a "domesticating" pedagogy.[39] In *Pedagogy of the Oppressed*, Freire critiqued what he saw as the prevailing approach to education—the "banking" approach.[40] With the "banking" approach to education, teachers deposit information into the minds of passive students. Information is static and detached from student experiences. Freire warned that, under the banking approach,

> [e]ducation thus becomes an act of depositing, in which the students are the depositories and the teacher is the depositor. Instead of communicating, the teacher issues communiqués and makes deposits which the students patiently receive, memorize, and repeat. This is the "banking" concept of education, in which the scope of action allowed to the students extends only as far as receiving, filing, and storing the deposits.[41]

Freire argued that the "banking" approach stifles creativity, promotes passivity, and domesticates rather than liberates students. In contrast, "problem-posing" begins with an awareness of knowledge as not static but rather an outcome of human processes. This awareness is central to student development of critical consciousness.[42] Freire states,

> In problem-posing education, people develop their power to perceive critically *the way they exist* in the world *with which* and *in which* they find themselves; they come to see the world not as a static reality, but as a reality in process, in transformation.[43]

Dialogue is central to Freire's approach to education. He writes, "Only dialogue, which requires critical thinking, is also capable of generating critical

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[37] Delgado & Stefancic, *supra* note 2, at 224.

[38] Eamon Tewell, *Putting Critical Information Literacy into Context: How and Why Librarians Adopt Critical Practices in Their Teaching*, IN THE LIBR. WITH THE LEAD PIPE (Oct. 12, 2016), http://www.inthelibrarywiththeleadpipe.org/2016/putting-critical-information-literacy-into-context-how-and-why-librarians-adopt-critical-practices-in-their-teaching [https://perma.cc/Z2SQ-6PH5].

[39] PAULO FREIRE, PEDAGOGY OF THE OPPRESSED 51 (Myra Bergman Ramos trans., 3d ed. 2000).

[40] *Id.* at 71-86.

[41] *Id.* at 72.

[42] *Id.* at 73.

[43] *Id.* at 83.

thinking."[44] As such, "problem-posing" presents questions to students about the world and asks them to reflect on it. It further asks them how they perceive themselves in relation to it, and how they can become participants in the process of investigation and engagement with reality.[45]

Several academic librarians and educators have used the "problem-posing" method to help students develop a critical consciousness about information and knowledge. For example, Heidi L.M. Jacobs uses problem-posing about Wikipedia to help students develop a critical consciousness about the nature of authorship. In doing so, she uses Wikipedia's history and talk sections to reveal the conflicts that occur "behind the scenes."[46] Other librarians have asked students to do a deep reading of Library of Congress and Dewey subject headings, with dialogue focusing on the people and culture that created them.[47]

With inquiry and dialogue at its heart, the possibilities for wielding problem-posing education in the face of the quadruple helix are endless.

V. PROBLEM-POSING ABOUT THE QUADRUPLE HELIX IN THE CLASSROOM: EXAMPLES

What follows are examples of topics and questions ripe for dialogue and problem-posing in the classroom.

A. *The West Topic and Key Number System*

As one of the original strands of Delgado and Stefancic's "triple helix," the West Topic and Key Number system has provided a dominant organizational paradigm for caselaw for over a century. The system summarizes points of law from a case and places each one under a topic and subtopic in West's legal taxonomy. Every point of law distilled from the cases are placed into the taxonomy. Using a West Digest in print or online, researchers can find caselaw by selecting a topic and subtopic; they are then presented with a list of relevant case summaries. In addition, the Topic and Key Number system informs Westlaw's algorithm, thus influencing search results.

In the classroom, inquiry and dialogue should focus on the "invisible hands" involved in the history and creation of the West Topic and Key Number system, how the classification system influences and shapes thought about the legal system, and the human bias that accompanies classification systems. Some example questions include:

- Who created the West Topic and Key Number system? What kind of society did they live in?

[44] *Id.* at 92.

[45] *Id.* at 79-85.

[46] Heidi L.M. Jacobs, *Posing the Wikipedia "Problem": Information Literacy and the Praxis of Problem-Posing in Library Instruction*, *in* CRITICAL LIBRARY INSTRUCTION 179, 189 (Maria T. Accardi, Emily Drabinski & Alana Kumbier eds., 2010).

[47] Tewell, *supra* note 35, at 16.

- Who was excluded from the process of creating the original taxonomy?
- How do these categories reflect societal values?
- Consider the subtopic "Parentage and legitimacy in general," which falls under the main topic of "Parent and Child." How does this categorization reflect social values?
- Why does the Topic and Key Number system persist? Who owns and controls its existence?
- What happens to points of law that do not fit into the taxonomy?
- Do you think there is a process for adding or deleting new topics?

B. *Algorithms and Artificial Intelligence*

Most of the modern legal research databases—Westlaw, Lexis, Bloomberg Law, and Fastcase—use algorithms to return results that are "probabilistically guessing at intent."[48] As such, it is not enough to teach students how to navigate those systems or how to best construct a search query. Students should also think about how and why their search terms produce the results that appear on the screen in the order that they appear.

In the classroom, inquiry and dialogue should focus on the "invisible hands" that participate in the development of the algorithms and artificial intelligence underlying legal research databases and the human biases that, intentionally or not, have become a part of them. Some example questions include:

- Who creates the algorithms that are built into our legal research systems?
- What factors are considered by the algorithm and how does that filter and shape what we see on the screen?
- How do crowdsourcing technologies shape our search results?
- How might results produced by algorithms reproduce existing systemic biases?
- How might you as a student investigate algorithmic bias?

CONCLUSION

In 2007, Delgado and Stefancic wrote: "New ideas come from turning a structure of thought on its side and looking at it in a new way—flipping it or turning it inside out."[49] With critical information literacy as a foundation, the classroom can become a place for flipping, turning, and questioning the "invisible hands" that shape and display their legal research. The classroom can

[48] Susan Nevelow Mart, Joe Breda, Ed Walters, Tito Sierra & Khalid Al-Kofahi, *Inside the Black Box of Search Algorithms*, AALL SPECTRUM, Nov.-Dec. 2019, at 10, 15.

[49] Delgado & Stefancic, *supra* note 10, at 322.

become a place for inquiry and dialogue. It can be a place for freeing minds from the binds of the quadruple helix.