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How (Not) to Search for the Truth and (Perhaps) Improve the Human Condition

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1. INTRODUCTION

Mark Twain popularized the phrase “there are three kinds of lies: lies, damned lies, and statistics” to iterate how numbers — especially when arranged by those with self-interest — can mislead one away from the truth⁽¹⁾. Twain wrote these words more than a century ago, but instead of shedding these lies and finding better techniques to pan golden truths out of gravel, humanity seems to have gone astray. Today, we are living through the era of big data, fake news, and disinformation campaigns that have transformed social media platforms into propaganda machines⁽²⁾. Those with vested interests are waging wars against experts attempting to shed light on the truth, especially when their findings become inconvenient for their political narratives⁽³⁾. Well-reasoned respectful dialogues have been swapped for online gauntlets occupied by anonymous

(1) Mark Twain, “Chapters from My Autobiography XX,” *North American Review*, (5 July 1907) (misattributing the quote to Disraeli, who never wrote or uttered such words).

(2) Scott Shane, “Five Takeaways from New Reports on Russia’s Social Media Operations,” *The New York Times*, (17 December 2018). Available at: <https://www.nytimes.com/2018/12/17/us/politics/takeaways-russia-social-media-operations.html> (last accessed 26 November 2019).

(3) Ronald Brownstein, “Trump’s War on Expertise is Only Intensifying,” *The Atlantic*, (21 November 2019). Available at: <https://www.theatlantic.com/politics/archive/2019/11/trump-attack-vindman-yovanovitch-hill/602383/> (last accessed 26 November 2019); see also, Oliver Milman, “Trump Administration’s War on Science has Hit ‘Crisis Point’, Experts Warn”, *The Guardian*, (3 October 2019). Available at: <https://www.theguardian.com/science/2019/oct/03/science-trump-administration-crisis-point-report> (last accessed 26 November 2019).

trolls and ubiquitous charlatans.

Coupled with the advent of the Internet and search engines that hold more than 1, 200 petabytes of information, these troubling trends suggest that the number of lies that exist today, relative to the times of Twain, has increased. It must be safe to conjecture then that our search for truths — the supposed key to improving the human condition — has become, if not more difficult, at least more complicated.

In this Anthropocene, we — the people — are driving ourselves dangerously close to the edge of calamity. There is a dire need for all of us to unite and resolve collective action problems of biblical proportions, ranging from climate change to the refugee crisis that is shaking our democratic institutions and social sensibilities to the core. Yet, rather than banding together to resolve these time-sensitive issues, we bicker contentiously and voluntarily sabotage the problem-solving process. As a result, we seem more divided than ever before and are becoming even more fragmented and polarized as misinformation and tribalism create wedges between us.

Tucked neatly within the confines of the academic ivory tower, many academics publish prescriptions that supposedly help us remedy this malaise, but our work sometimes fall on deaf ears, are contested, weaponized to serve some vested interest, or — worse — intentionally manipulated to spread misinformation and lies, thus becoming a part of the problem. To convert this diatribe into something that resembles a point, the main aim of this contribution will be to suggest that in order to combat the general state of affairs, to promote truth-seeking, and to foster the improvement of the human condition, we must start thinking more holistically (even the lawyers amongst us). What this entails, from an academic and educational perspective, is two-fold: 1) for researchers to be more interdisciplinary, and 2) for teachers and educators to embrace some aspects of liberal arts and global citizenship education into their curriculum.

In order to convey the need and the importance of this transformation, this article will start with a selective account of how academics have contributed to this malaise and how it is impacting the laws and policies that exist today (Section 2). This will be followed by how law- and policymakers can better grasp and resolve the problems that they face by looking beyond just the law and understanding other fields of study (Section 3). This section will be complimented by the following section (Section 4) on how teachers and educators can incentivize this change by promoting interdisciplinary and liberal arts education that gives reverence to themes such as global citizenship and 21st Century skills⁽⁴⁾. The conclusion (Section 5) will aim to stress the importance of this small revolution as the prerequisite for developing future problem-solvers who not only possess a firm moral compass, but who are equipped with the analytical capacities to distinguish the truths from the lies and be competent in using scientific findings in a manner that will actually work towards improving the human condition.

2. THE (UNINTENDED) LIES WE TELL

As noted in the introduction, academics — the alleged experts and specialists in their respective fields — can, from time to time, contribute to the mis- and disinformation that plague our societies. These lies can be placed in two broad categories: intentional and unintentional. While the latter may seem less sinister, both types of false information can prove to be rather harmful, especially when taken seriously and legitimized by civil society, or worse, by law- and policymakers.

2.1 Varying Shades of Academic Deception

This sub-section will highlight some of the well-publicized embarrassments that have called into question the integrity and the legitimacy of various scientific findings from fields as diverse as sociology, psychology, economics, political science, and med-

(4) The exact definitions for these amorphous terms will be detailed in Section 4.

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ical sciences.

2.1.1 *Intentional Deceit and P-Value Hacking*

In the Netherlands, the downfall of the once renowned social psychologist, Diederik Stapel, still taints the credibility of social psychology as a field of study. Stapel used to specialize in human attitudes and behaviors and published research findings that allegedly showed “trash-filled environments tended to bring out racist tendencies in individuals” or that “eating meat made people selfish and less social” using data that he supposedly collected around the Netherlands⁽⁵⁾. The problem, however, was that all of his research data was fabricated, as in he did not actually collect any real data. His case was a clear cut example of how an academic, seeking for publication glory — often coupled with promotion and prestige — can maliciously cut corners for personal gain and deceive not only the scientific community, but the general public at large given that his findings were published by media outlets and popular scientific journals.

While this type of aggressive academic fraud are brought to light every now and then⁽⁶⁾, fortunately, it does not happen very often. What does happen with more alarming frequency, however, is the practice of “P-value hacking” especially in the fields of

(5) Yudhijit Bhattacharjee, “The Mind of a Con Man,” *The New York Times Magazine*, (26 April 2013). Available at: <https://www.nytimes.com/2013/04/28/magazine/diederik-stapels-audacious-academic-fraud.html> (last accessed 30 November 2019).

(6) For example, Harvard University psychologist, Marc Hauser, who authored the book, *Moral Minds*, which was on how nature designed our sense of right and wrong, was let go when investigators discovered that “the results of the experiment [involving video recording of monkeys] were... knowingly and falsely reported...”; see, Carolyn Y. Johnson, “Harvard Report Shines Light on Ex-Researcher’s Misconduct,” *Boston Globe*, (29 March 2014). Available at: <https://www.bostonglobe.com/metro/2014/05/29/internal-harvard-report-shines-light-misconduct-star-psychology-researcher-marc-hauser/maSUowPqL4clXrOg-j44aKP/story.html> (last accessed 30 November 2019) (reporting that “Hauser changed the data so that it would show a desired effect” and that there was “a disturbing pattern of misrepresentation of results and shading of the truth” with “reckless disregard for basic scientific standards.”).

social science and medicine, where statistical hypothesis testing is often a crucial part of their research. Before getting into the actual practice of hacking, it is worth noting at the onset that a P-value (an abbreviation for probability value) is a value between 0 and 1 that is generated during statistical hypothesis testing, which indicates the strength of the null hypothesis⁽⁷⁾. In layman's terms, P-value is a sign of how significant the research finding is and lower the P-value, the more significant the research is, which means more likely that the research will be published⁽⁸⁾.

The problem here is that P-values can be artificially lowered if you know what you are doing. Known commonly as P-Value hacking, there are various ways in which researchers can modify their methodology or research parameters to manually lower their P-values: For example, psychologist Uri Simonsohn, who states that "P-hacking is trying multiple things until you get the desired result", notes that the hacking can be done by monitoring your data input as it is collected to see what impact that input has on the P-value or dropping one or more of the conditions to ensure that the P-value stays low⁽⁹⁾. In short, some researchers can manipulate the data that they test by carefully selecting their inputs, thus ensuring that the P-value stays low enough for publication. In doing so, however, the researcher taints the results of the study and makes the conclusion an inaccurate, biased representation of the truth.

(7) Silvia Bacci and Bruno Chiandotto, *Introduction to Statistical Decision Theory: Utility Theory and Causal Analysis*, (Boca Raton: CRC Press, 2020), at p. 78 (defining P-value as "the probability that the test statistic would be more extreme than the actual observed value," which is useful in statistical analysis "because it provides a measurement of empirical evidence against the null hypothesis.").

(8) Most journals do not consider publishing any research with a P-value higher than 0.05.

(9) Regina Nuzzo, "Statistical Errors," *Nature*, Vol. 506 (13 February 2014): 150–152, at p. 152 (quoting Simonsohn and noting that P-hacking is also referred to as "data-dredging, snooping, fishing, significance-chasing and double-dipping.").

2.1.2 *Subjectivity Creep*

Unfortunately, there are also cases of unconscious P-value hacking or at least instances where choices that a researcher makes end up altering the result of the outcome without any intention of manipulating their findings. What this means is that there are instances where researchers can look at the exact same data, and without any deceitful intent, reach entirely different conclusions. For example, a research lead by Brian Nosek of Center for Open Science gathered 29 teams consisting of 61 analysts to answer one question: Do dark-skinned football players get more red cards⁽¹⁰⁾? Long story short, even though the teams all had the same data to work with, 20 teams concluded that dark-skinned players were red carded more often, while 9 teams found that there were no significant correlation between the two variables⁽¹¹⁾. What this study reveals is that even scientists that strive to be objective and ensure that their research is conducted in an unbiased, ethical manner can look at the same data set and reach very different results.

This actually happens rather regularly because researchers employ different methodologies. In the football study, for example, the teams employed a variety of methodologies “from simple linear regression techniques to complex multilevel regressions and Bayesian approaches,” and the teams also made “different decisions about which secondary variables to use in their analyses.”⁽¹²⁾ This shows that even when looking at ob-

(10) Raphael Silberzahn and Eric L. Uhlmann, “Crowdsourced Research: Many Hands Make Tight Work,” *Nature*, Vol. 526 (8 October 2015): 189–191; see also, Raphael Silberzahn, Eric L. Uhlmann, et al., “Many Analysts, One Data Set: Making Transparent How Variations in Analytic Choices Affect Results,” *Advances in Methods and Practices in Psychological Science*, 1 (3) (2018): 337–356. Available at: <https://journals.sagepub.com/doi/pdf/10.1177/2515245917747646> (last accessed 30 November 2019).

(11) *Ibid.*, (showing that one team even found a statistically significant result that dark-skinned players were three times as likely to get red cards).

(12) Christie Aschwanden, “Science Isn’t Broken,” *FiveThirtyEight*, (19 April 2015). Available at: <https://fivethirtyeight.com/features/science-isnt-broken/#part1> (last accessed 30 November 2019) (reporting on the study conducted by Nosek).

jective data, subjective decisions must be made and results must be interpreted according to the researcher's beliefs and intuitions, which result in varying conclusions even when looking at an identical data set. According to Eric L. Uhlmann, one of the lead researchers of the project, "our study shows that results are heavily reliant on analytic choices," meaning that depending on the methodology chosen, results differ greatly. In other words, even when there is no deceitful intent, the researcher's subjectivity inevitably creeps in, thus altering the research conclusion.

If anything, the existence of academic fraud, P-value hacking, subjectivity creep, and other practices like HARKing (the practice of "hypothesizing after the results are known")⁽¹³⁾ should make all of us at least double check our sources, even if they appear legitimate at face value. Very often, there is no single research that can offer us the whole or absolute truth, which can be applied universally across time. The idea behind most social science or health research is that given certain circumstances a particular condition can lead to certain outcomes. It is merely one manifestation of the truth at that moment in a controlled environment. To avoid formulating beliefs based on faulty or shoddy science, only findings that can be retested and verified through replication should be considered trustworthy, especially when law- and policymakers rely on it as evidence or as the impetus for implementing new laws and policies. This idea of replication, however, brings us to our next problem.

2.2 The Replication Crisis and Its Fallout

The replication crisis in a nutshell is about how an alarming percentage of published research results in the field of social science cannot be replicated⁽¹⁴⁾. As early as 2005,

(13) See e.g. Norbert L. Kerr, "HARKing: Hypothesizing After the Results are Known," *Personality and Social Psychology Review*, Vol. 2 (3) (1998); see c.f., Jeffrey B. Vancouver, "In Defense of HARKing," *Industrial and Organizational Psychology*, Vol. 11 (1) (2019): 73-80 (contesting the recommendation that HARKing not be taught, encouraged, or practiced)

John Ioannidis, the pioneering meta-scientist from Stanford, published his now well-known piece, “Why Most Published Research is False” to flag this problem. In the article, Ioannidis wrote about how small field studies, or factors like small sample size and “greater flexibility in designs” made it more likely that the research finding did not accurately reflect reality⁽¹⁵⁾.

In the same year, Ioannidis also published an article where he attempted to replicate 49 of the “most highly regarded research findings in medicine” over the previous decade and found that some of the findings simply could not be replicated⁽¹⁶⁾. Since Ioannidis’ findings, the replication crisis has seemingly escalated and metastasized, now engulfing other fields of science ranging from political science⁽¹⁷⁾ to economics⁽¹⁸⁾.

(14) See e.g., Brian Nosek, *et al.*, “Estimating the Reproducibility of Psychological Science,” *Science*, 349 (6251) (2015) (reporting that of the “100 experiments reported in papers published in 2008 in three high-ranking psychology journals” only “39% of effects were subjectively rated to have replicated the original result.”); see also, Colin F. Camerer, Anna Dreber, *et al.*, “Evaluating the Replicability of Social Science Experiments in *Nature* and *Science* between 2010 and 2015,” *Nature Human Behaviour*, Vol. 2 (2018): 637–644 (finding that of the 21 studies that they attempted to replicate, only 13 reproduced the same results as their originals); Richard A. Klein, Michelangelo Vianello, *et al.*, “Many Labs 2: Investigating Variation in Replicability Across Samples and Settings,” *Advances in Methods and Practices in Psychological Science*, 1 (4) (2018): 443–490 (finding that of the 28 prominent cases that the team of almost 200 psychologists have attempted to replicate, only 14 was replicated); and, Ed Young, “Psychology’s Replication Crisis is Running Out of Excuses,” *The Atlantic*, (19 November 2018). Available at: <https://www.theatlantic.com/science/archive/2018/11/psychologys-replication-crisis-real/576223/> (last accessed 30 November 2019).

(15) John P.A. Ioannidis, “Why Most Published Research Findings are False,” *PLoS Med*, 2 (8) (2005). Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1182327/> (last accessed 30 November 2019).

(16) John P.A. Ioannidis, “Contradicted and Initially Stronger Effects in Highly Cited Clinical Research,” *The Journal of American Medical Association*, 294 (2) (2005): 218–228. Available at: <https://jamanetwork.com/journals/jama/fullarticle/201218> (last accessed 30 November 2019) (reporting that “ [o] f 49 highly cited original clinical research studies, 45 claimed that the intervention was effective. Of these, 7 (16%) were contradicted by subsequent studies, 7 others (16%) had found effects that were stronger than those of subsequent studies, 20 (44%) were replicated, and 11 (24%) remained largely unchallenged.”).

Perhaps more problematically, the crisis has led to the delegitimization of various scientific findings and have made social science a target of mockery, as demonstrated by the great chocolate hoax.

2.2.1 *The Great Chocolate Hoax*

Concerned by the state of affairs in academia, a team consisting of German documentary filmmakers Peter Onneken and Diana Löbl together with biologist/journalist, John Bohannon, decided to write an article employing some of the tampering tactics noted above like HARKing to see if any academic journal would publish it. To make the con more convincing, Bohannon created a shell institute and a website for the “Institute of Diet and Health” and ran a test consisting of only 16 “test subjects” eating chocolates and drafted an article titled “Chocolate with High Cocoa Content as a Weight-loss Accelerator”⁽¹⁹⁾. The dirty secret behind this research was that not only did they employ an extremely small sample size, but they looked at 18 different measurements ranging from weight, cholesterol, sodium, blood protein levels, etc. and ultimately picked weight as the measurement to “assess” because it was the measurement that gave them the most significant P-value⁽²⁰⁾.

(17) Andrea Saltelli, “Why Science’s Crisis Should Not Become a Political Battling Ground,” *Futures*, Vol. 104 (2018): 85–90 (arguing that the replication crisis in science has created openings for politicians to attack scientific findings that do not align with their politics).

(18) Andrew C. Chang and Phillip Li, “Is Economics Research Replicable? Sixty Published Papers from Thirteen Journals Say ‘Often Not,’” *Critical Finance Review*, Vol. 7 (2018) (noting that they were “only able to replicate “29 of 59 papers (49%) with assistance from the authors” and “ [b] ecause [they] were able to replicate less than half of the papers in [their] sample even with help from the authors, [they] assert that economics is often not replicable.”).

(19) Johannes Bohannon, Diana Koch, Peter Homm, and Alexander Driehaus, “Chocolate with High Cocoa Content as a Weight-loss Accelerator,” *International Archives of Medicine*, Vol. 8 (1) (2015) (concluding with P-value of less than 0.001 that “ [c] onsumption of chocolate with a high cocoa content can significantly increase the success of weight-loss diets.”).

The article was allegedly “rigorously peer-reviewed” and ultimately published by *The International Archives of Medicine*, but only after Onneken made a payment of 600 euros for publication costs⁽²¹⁾. The news of this wonderful “discovery” — that eating chocolate can help people lose weight — spread like wildfire with news sources like *Bild*, Irish Examiner, Times of India, Huffington Post and websites for magazines like *Shape* and *Cosmopolitan* reporting the “discovery” without even contacting the researchers or checking the science behind their claim⁽²²⁾. Using this hoax as his soapbox, Bohannon cautioned that “ [y]ou have to know how to read a scientific paper — and actually bother to do it. For far too long, the people who cover this beat [journalists reporting on health sciences] have treated it like gossip, echoing whatever they find in press releases.”⁽²³⁾

The same lesson can be extended to the general public as a whole, but especially to law- and policymakers that rely on these pop- or pseudo-sciences to design laws and policies. This particular concern will be tabled until the following subsection (Section 2.3), but it is important to note in summation here that we must not blindly trust newspapers articles and magazines that rely on these dubious scientific practices as their single source of information.

(20) John Bohannon, “I Fooled Millions into Thinking Chocolate Helps Weight Loss. Here’s How,” *Gizmodo*, (27 May 2015). Available at: <https://io9.gizmodo.com/i-fooled-millions-into-thinking-chocolate-helps-weight-1707251800> (last accessed 30 November 2019).

(21) *Ibid.*

(22) *Ibid.* It is worth noting here that the practice of researchers paying to publish is nothing out of the ordinary. Especially if the journal is an open access journal, the cost of publishing could potentially be upwards of 3000 euros.

(23) *Ibid.*, (adding that “ [h]opefully, our little experiment will make reporters and readers alike more skeptical.”).

2.2.2 *On Going Repairs*

To present a more thorough view, it must be noted that there are various ongoing efforts that aim to remedy these problems and to restore credibility back into science. Groups such as the aforementioned Center for Open Science, Open Science Collaboration (OSF), and Meta-Research Innovation Center are constantly investigating and attempting to replicate series of published findings, distinguishing the good from the bad. The National Academies of Sciences, Engineering, Medicine has also just published their *Reproducibility and Replicability in Science* handbook, which builds atop the foundation laid out by Ioannidis in 2005 to make recommendations “for improving rigor and transparency in scientific and engineering research and will identify and highlight compelling examples of good practices.”⁽²⁴⁾ While there is indeed increased awareness for those in the know to keep an eye out for the rotten apples, as Bohannon cautions, if we are not trained to read scientific articles or lack the basic understanding of terms like P-value, we can easily be deceived and left to believe in misinformation, convinced that “science” is on our side. This brings us to the next subsection on the potential harms that this the state of affairs can lead to.

2.3 So What's the Harm?

To briefly summarize the points raised thus far, it is possible for academics with no scruples to publish tampered data with pay-to-publish journals with little to no real peer-review and to create enough buzz and media attention for the findings that can enter the mainstream media. Even when there is absolutely zero intention to deceive or manipulate the data, given that researchers are required to make judgment calls in their research all the time and considering that there is always room to interpret the findings, subjectivity can — and do — creep in. In either case, we — the academics — can (in)

(24) The National Academies of Sciences Engineering Medicine, *Reproducibility and Replicability in Science*, (Washington D.C.: The National Academies Press, 2019), at p. 24.

voluntarily become perpetrators of spreading false or incomplete information to the public. This problem is exacerbated when decision-makers, from legislatures and policymakers to business leaders or even educators buy into these false information and start making rules that govern or regulate the manner in which we behave accordingly. This subsection will first look at how the issue of research funding could further exacerbate this problem, and the potential risks that could come from it.

2.3.1 *Best Science that Money Can Buy?*

Part of the skepticism cast towards the scientific community comes not only as a result of academic fraud or subjectivity creep, which undoubtedly contributed to the replication crisis, but the underlying incentives that lead to these types of malpractice in the first place. As noted earlier, publishing is a prerequisite for those aspiring to climb up the academic ladder and like young associates seeking to make partner in a law firm, young researchers must find research funding in order to ensure tenure (at least in most cases). While research funding should not come with any strings attached from those with vested interests to sway the findings one way or the other, there is evidence to suggest that this is not always the case.

Lawrence Lessig makes a particularly compelling case on how money tends to have a corrupting influence on research outcomes: For example, he compared studies conducted on the safety of Bisphenol A (“BPA”) and discovered that of the 176 studies available, 152 found BPA to be harmful to human health, while 24 did not⁽²⁵⁾. The more interesting fact was that when he compared research that was funded by the plastic or other related industries versus those that were independently funded, Lessig found that none of the 13 industry funded research concluded that BPA was harmful (compared to

(25) Lawrence Lessig, *Republic, Lost: How Money Corrupts Congress — and a Plan to Stop It*, (New York: Twelve, 2012), at p. 25.

152 that concluded that it was indeed harmful)⁽²⁶⁾. Similar trends can be found over controversies related to whether radiation emitted by mobile phones are harmful⁽²⁷⁾ or whether Genetically Modified Organism (GMO) pose health risks for humans⁽²⁸⁾. In other words, not only must we — the public — keep a watchful eye on research methodologies and publication practices, but we must also look behind the veil and see who is funding the research to ensure the objectivity of the research findings.

2.3.2 *When Lawyers, Legislatures, and Policymakers are Duped*

While the replication crisis and various instances of academic fraud pose serious risks that jeopardize scientific integrity, the concern becomes even larger when we bear in mind that law- and policymakers are also consumers of these false or tampered information. This is to imply that some laws and policies have been made based on faulty assumptions or reliance on bad science, but this issue will be tabled until the following section (Section 3). For the time being, let us note that we live in a time, where some corporations wield more influence and affluence than some sovereign states⁽²⁹⁾, and it is worth considering in light of this, just how their abundant resources are being utilized, not only to nudge governmental regulations and policies, but along the way, alter public perceptions.

While the influence that corporate lobbyists have over elected government represen-

(26) *Ibid.* (summarizing the situation as follows: “none of the industry-funded studies found evidence of harm, while more than 85 percent of the independent studies did.”).

(27) *Ibid.*

(28) *See e.g.*, Joël Spiroux de Vendômois, Dominique Delliér, *et al.*, “Debate on GMOs Health Risks after Statistical Findings in Regulatory Test,” *International Journal of Biological Sciences*, 6 (6) (2010): 590–598.

(29) Parag Khanna, “There 25 Companies are More Powerful than Many Countries,” *Foreign Policy*, (March/April 2016) (listing companies such as Walmart, Royal Dutch Shell, and Apple to be more powerful and wealthy than many countries around the world).

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tatives likely vary across different countries, take for example the United States, where corporations are spending \$2.6 billion a year on lobbying expenditures to influence elected officials⁽³⁰⁾. Faced with this fact, it would be borderline foolish not to assume that money has at least some corrupting influence on scientific research and that some politicians will gladly cite to these industry-backed findings to make a case for — or against — some related regulatory measure (e.g. to ban BPA, GMOs, etc.). Or worse, policymakers could even call for the commission of these types of biased research to justify the promulgation of some law that aligns with their political interests, but not necessarily in the best interests of the constituents. This is the harm that comes, partially as a result of shoddy or rotten science and dubious research practices that exists today.

Ultimately, many of us laymen and laywomen lack the expertise to read and understand — never mind critique — scientific articles full of technical jargon. For many lawyers, seeing numbers, tables of data, and equations in an article is enough to induce a near allergic reaction. Many of the law students that I encounter say that they chose to study law, because they did not want to do any math. Here in lies the root problem: Law- and policymakers — who are generally not experts in other sciences — rely on specialists, experts, and academics to guide their policy, which means that most of them lack the basic skills necessary to call out and dismiss questionable science, which we know is out there.

We conclude this section by summarizing that there are reasons to be concerned by some of the existing scientific findings that cannot be replicated, but nevertheless,

(30) See e.g., Lee Drutman, “How Corporate Lobbyists Conquered American Democracy,” *The Atlantic*, (20 April 2015). Available at: <https://www.theatlantic.com/business/archive/2015/04/how-corporate-lobbyists-conquered-american-democracy/390822/> (last accessed 30 November 2019) (adding for the sake of comparison that the American people spend \$2 billion to fund Congress).

some law- and policymakers continue to rely on them to promulgate laws and regulations any way so long as it serves their political purpose. This can render negative repercussions for people, but unfortunately, many of us lack the necessary skill set to properly assess the underlying scientific findings. The takeaway from this section, however, should not be to simply distrust scientists or villainize experts, but for us to read and learn more so that we can distinguish good science from the bad science ourselves.

3. LAWYERS AND THEIR BLIND SPOTS

The previous section made a claim that laws and policies have been made based on faulty assumptions or with reliance on incomplete and bad science. One example of this can be observed in the field of law and economics. Economics has traditionally relied on the rational choice theory and its subset, the expected utility theory, as its core assumptions. This has impacted the law, legal academics, and the legislatures operating in this hybrid field law and economics, as they have designing sanctions or regulatory measures relying on economic models that assumed people make rational choices that optimizes their outcome. Legislatures and lawmakers relying on law and economic methodologies predict that the likelihood of whether an individual breaks the law would depend on the severity of the punishment and the probability of being caught committing the violation. Nobel Prize winning economist, Gary S. Becker, wrote at length to demonstrate that individuals behave in this rational and utility maximizing way in many circumstances⁽³¹⁾, particularly in the context of criminal law: For instance Becker noted that an economist usually “assumes that a person commits an offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities.”⁽³²⁾

The rational choice theory and the field of law and economics produced a plethora of fruitful scholarship, but has more recently been challenged by Daniel Kahneman, Rob-

ert J. Shiller, Richard Thaler and other Nobel Prize winners in Economic Sciences, who have contributed to the development of a new field of economics known as behavioral economics. Behavioral economics integrates findings from psychology and sociology into economics, to evidence that humans are not always rational nor utility-maximizing and therefore challenges traditional economics' over-reliance on rational choice theory. This emerging field emphasizes the point that we are constrained by bounded rationality and a wide assortment of biases and heuristics, which make us "predictably irrational."⁽³³⁾

This is to suggest that if law- and policymakers have designed, implemented, and promulgated laws and policies in accordance with the rational choice assumption, such laws and policies may fail to change the behavior of their targets as effectively once thought. It is possible that laws designed with the assumption that individuals are predictably irrational may — in some instances — prove to be more effective than those with the assumption that we are rational, utility maximizing *homo economicus*. Accordingly, this section will elaborate on some of these irrationalities and limitations that challenge us as humans beings and how it can create blind spots that make it diffi-

(31) See generally, Gary S. Becker, "Crime and Punishment: An Economic Approach," *Essays in the Economics of Crime and Punishment*, Gary S. Becker and William M. Landes (Eds.). (New York: Columbia University Press, 1974): 1–54, 17 (noting that "rational public policy indirectly insures that 'crime does not pay' through its choice of p and f ."); see also, Gary S. Becker, *The Economics of Discrimination*, (Chicago: The University of Chicago Press, 1957); cf., Gary S. Becker, "Irrational Behavior and Economic Theory," *Journal of Political Economy*, Vol. 70 (1962).

(32) Gary S. Becker, "Crime and Punishment: An Economic Approach," *Essays in the Economics of Crime and Punishment*, Gary S. Becker and William M. Landes (Eds.). (New York: Columbia University Press, 1974): 1–54, at p. 9 (adding that "[t] his approach implies that there is a function relating the number of offenses by any person to his probability of conviction, to his punishment if convicted, and to other variables, such as the income available to him in legal and other illegal activities, the frequency of nuisance arrests, and his willingness to commit an illegal act.").

(33) See generally, Dan Ariely, *Predictably Irrational: The Hidden Forces That Shape Our Decisions*, (New York: HarperCollins Publishers, 2008).

cult for us to see the truth. Additionally, this section will highlight where some laws or legal conflicts have fallen prey to these quirks and idiosyncrasies of mankind, which has led to ineffective regulatory measures, or worse, unnecessarily escalation of conflicts that can further polarize us. Last but not least, this section will offer some examples of non-legal concepts that can be used by law- and policymakers to help them resolve conflicts better and attempt to improve the human condition.

3.1 Our Bounded Rationality, Biases, and Heuristics

If Herbert A. Simon — yet another Nobel Prize winner in Economics — taught us anything, it is that our rationality is bounded and we are satisficers, meaning that our cognitive abilities have limits and we do not always maximize utility or seek out optimal solutions; instead, we settle for simpler, satisfactory solutions⁽³⁴⁾. After all, calculating the pros and cons of each decision that we make and finding optimal solutions can be a tiring endeavor, not to mention that everyone seems to be running short on time these days. This means that we are often taking mental shortcuts, making irrational choices, only to reach non-optimal, yet satisfactory outcomes.

One manifestation of these quirks was presented in Daniel Kahneman and Amos Tversky's discovery of prospect theory, where they established that people have "inconsistent preferences when the same choice is presented in different forms" due to loss aversion and framing effects⁽³⁵⁾. This is to note the power of a good narrative, which enables the storyteller to frame and nudge the choices that people make⁽³⁶⁾. Kahneman and Tversky went on to discover large array of cognitive biases together and published the summary of their collaboration in their book, *Thinking, Fast and*

(34) See generally, Herbert A. Simon, *Models of Bounded Rationality: Economic Analysis and Public Policy (Book I)*, (Cambridge: MIT Press, 1984).

(35) See e.g., Robert J. Shiller, *Narrative Economics: How Stories Go Viral & Drive Major Economic Events*, (Princeton: Princeton University Press, 2019).

Slow⁽³⁷⁾. The development of behavioral economics and the discovery of various biases and heuristics that challenge our faith in human judgment has influenced the field of law with the advent of nudging as popularized by Kahneman's protégé Richard H. Thaler and Harvard legal scholar Cass R. Sunstein⁽³⁸⁾. In short, nudges are subtle reinforcements or mere suggestions that aim to influence human behavior and decision-making without the enforcement or the mandatory element of laws and regulatory measures⁽³⁹⁾. Examples of governments utilizing nudging successfully have been documented to have increasing rate of vaccinations, energy conservation through reduction of household energy consumption, retirement saving, and much more⁽⁴⁰⁾.

Similar to the lessons we learned from the previous section, we must be wary of looking at the world through a singular narrative. There is usually more than one side to a story and only after seeing the reality from multiple perspectives can we develop a more comprehensive view of the world and understand its delicate inner workings. This is to suggest that law- and policymakers must not only make efforts to understand the basic elements of traditional economics, but also attempt to familiarize themselves with basic tenets of behavioral economics, narrative economics, and various other ways of understanding and analyzing our complicated, entangled world. However, as

(36) Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47 (2) (1979): 263–291 (observing that people tend to be more risk-averse when a certain choice is framed as an opportunity for a gain, while risk-seeking when that same condition of expected utility is framed as a possibility of a loss).

(37) Daniel Kahneman, *Thinking, Fast and Slow*, (New York: Farrar, Straus and Giroux, 2013).

(38) Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness*, (New York: Penguin Books, 2008).

(39) *Ibid.*

(40) Shlomo Benartzi, John Beshears, Katherine L. Milkman, Cass R. Sunstein, and Richard H. Thaler, "Governments are Trying to Nudge Us into Better Behavior. It is Working?," *The Washington Post*, (11 August 2017). Available at: <https://www.washingtonpost.com/news/wonk/wp/2017/08/11/governments-are-trying-to-nudge-us-into-better-behavior-is-it-working/> (last accessed 1 December 2019).

the next subsection will reveal, law- and policymakers sometimes fail to understand or even attempt to resolve their problems holistically. As the old saying goes, if you throw a problem into a room full of lawyers, the solution that they will come up with will be to make more laws, which may not be the ideal solution for that particular problem. Therefore, we — not only the lawyers amongst us, but all of us — need to learn how to understand the world we reside in better.

3.2 Tools for Understanding Our Complex World

It is easy to simply state that we need to understand our world, our problems, and our flaws better so that we can make better decisions, design better laws and policies, and resolve our collective action problems in a more significant and meaningful manner. Yet, it is difficult to conceptualize what that would entail or how we can go about actually attempting these grandiose tasks. This subsection will attempt to offer two short, yet pragmatic approaches to demonstrate the previously made point of our need for more holistic problem-solving.

3.2.1 *Regulating Corporate Malfeasance by Understanding Intrinsic Motivation*

The previous section noted the influence and the affluence that some corporations wield today. Many of these corporations are multinational corporations that operate seamlessly across borders and at times, cause devastating negative externalities (e.g. labor exploitation, pollution, etc.) along the way⁽⁴¹⁾. The laws aimed at reducing these corporate misbehaviors, more often than not, rely on basic notions of traditional economics: In other words, the law simply assumes that a company will break the law if the expected utility to the company exceeds the utility it could get by using its time and other resources in conducting other activities⁽⁴²⁾. Take for example the ongoing debate

(41) See e.g., Mark T. Kawakami, *Flawed Strategies to Reducing Labor Exploitation: Reassessing the Role of Private Actors in the Global Supply Chain*, (Maastricht: Datawyse, 2017).

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about the UN IGWG's Zero Draft Treaty, which would compel States to ensure that multinational companies are conducting due diligence up and down their supply chain to ensure the absence of labor exploitation⁽⁴³⁾, or assortment of other transparency and sunshine policies, which assume that if a company detects labor exploitation taking place within their supply chain that they will actively work to address the problem⁽⁴⁴⁾. This is the principle aim of disclosure laws like the EU's Directive on Non-Financial Disclosure that require corporations to report on ESG metrics⁽⁴⁵⁾.

The problem is that many of these due diligence and disclosure measures do not incentivize most companies to want to be intrinsically pro-social. Naming-and-shaming mechanisms work only to the extent that companies can be shamed into compliance⁽⁴⁶⁾. Bound by an assortment of political roadblocks and budgetary constraints, no law or regulatory enforcement measures have seemingly been able to root out instances of labor exploitation, which still thrives within the global supply chain. Given the status quo, an idea worth exploring is not to simply create more and more laws, but to understand the problem from a different perspective. For example, while lawmakers and economists believe — thanks in part to rational choice and utility maximization assumptions — that we respond to incentives (e.g. laws), psychologists and sociologists have long held that “rewards and punishments are often counterproductive, because they un-

(42) Gary S. Becker, “Crime and Punishment: An Economic Approach,” *Essays in the Economics of Crime and Punishment*, Gary S. Becker and William M. Landes (Eds.). (New York: Columbia University Press, 1974): 1–54.

(43) See generally, Mark T. Kawakami, “Corporate Impunity and the Tolerable Lightness of Soft Laws,” *Tijdschrift voor Venootschapsrecht, Rechtspersonenrecht en Ondernemingsbestuur*, Vol. (2) (2019): 31–35.

(44) See e.g., Mark T. Kawakami, *Flawed Strategies to Reducing Labor Exploitation: Reassessing the Role of Private Actors in the Global Supply Chain*, (Maastricht: Datawyse, 2017).

(45) See generally, Kim Berg and Mark T. Kawakami, “Company Law is Bananas,” *Maastricht Faculty of Law Working Papers*, (2018): 1–33.

(46) Dan M. Kahan, “What’s Really Wrong with Shaming Sanctions,” *Texas Law Review*, Vol. 84 (2005–6): 2075.

dermine ‘intrinsic motivation’.”⁽⁴⁷⁾

Intrinsic motivation “arises from the intrinsic value of the [task] for the individual” or in this case, corporations, so imagine a company that truly cares about being socially responsible and that is willing to make lower profits to ensure the attainment of that goal⁽⁴⁸⁾. Extrinsic motivation on the other hand arises from “the desire to obtain outcomes that are apart from the [task] itself” so imagine a company who goes through the motion of compliance and checking off the list of laws that they must comply with simply because they do not want to be sanctioned⁽⁴⁹⁾. The law and economics approach generally focuses on extrinsic incentives, while behavioral economists consider ways to designating an incentive structure that fosters intrinsic motivations because that is how meaningful and sustainable changes can take place⁽⁵⁰⁾.

3.2.2 *Understanding Brexiters, Climate-Change Deniers, and Antivaxxers through Cultural Allegiance and Naïve Realism*

Whether it is news of Brexiters pushing for UK to crash out of the EU⁽⁵¹⁾, the escalating tensions between Japan and South Korea⁽⁵²⁾, or the tit-for-tat trade war between US and China⁽⁵³⁾, the news cycle is brimming with reports of conflict and strife. Even

(47) Roland Benabou and Jean Tirole, “Intrinsic and Extrinsic Motivation,” *Review of Economic Studies*, 70 (2003): 489–520, at p. 489.

(48) Teresa M. Amabile, “Motivational Synergy: Toward New Conceptualizations of Intrinsic and Extrinsic Motivation in the Workplace,” *Human Resource Management Review*, 3 (3) (1993): 185–201; see also, Richard M. Ryan and Edward L. Deci, “Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions,” *Contemporary Educational Psychology*, 25 (2) (2000): 54–67 (defining intrinsic motivation as “the natural human tendency to learn and assimilate.”).

(49) Teresa M. Amabile, “Motivational Synergy: Toward New Conceptualizations of Intrinsic and Extrinsic Motivation in the Workplace,” *Human Resource Management Review*, 3 (3) (1993): 185–201.

(50) Mark T. Kawakami, *Flawed Strategies to Reducing Labor Exploitation: Reassessing the Role of Private Actors in the Global Supply Chain*, (Maastricht: Datawyse, 2017), at p. 201 (arguing that laws and other extrinsic incentives can crowd out voluntary, involuntary incentives).

at a more micro-level, contentious arguments over whether climate change is real or whether vaccinations cause autism — incredibly — rage on. For the scientists amongst us, the latter two issues in particular are very disappointing state of affairs given that science has ruled in favor of one side of the argument. Yet, even in this context, it is important to bear in mind that there is more than one way to understand different perspectives no matter how asinine they may seem from a scientific vantage point.

For example, while it might be easy for the allegedly more educated folks to ridicule Brexiters, climate change deniers, and Antivaxxers, we must bear in mind two things: First, mockery is usually not the preferred method to changing people's opinions or their firmly held beliefs; and second, according to research by Yale Law School's Dan M. Kahan on cultural cognition and allegiance:

“What people ‘believe’ about global warming doesn’t reflect what they know; it *expresses* who they *are*... Accordingly, *if* you want to promote constructive public engagement with the best available evidence, you have to *change* the meaning of the climate change. You have to disentangle positions on it from opposing cultural identities, so that people aren’t put to a choice between freely appraising the evidence and being loyal to their defining commitments.”⁽⁵⁴⁾

(51) Richard Partinton, “Cost of Brexit to UK economy running at £40bn a year — Bank rate-setter,” *The Guardian*, (15 February 2019). Available at: <https://www.theguardian.com/business/2019/feb/14/brexit-has-cost-uk-economy-at-least-80bn-since-vote-bank-of-england-rate-setter> (last accessed 26 November 2019).

(52) Keith Johnson, “Why are Japan and South Korea at Each Other’s Throats,” *Foreign Policy*, (15 July 2019). Available at: <https://foreignpolicy.com/2019/07/15/why-are-japan-and-south-korea-in-a-trade-fight-moon-abe-chips-wwii/> (last accessed 26 November 2019).

(53) United Nations, “US-China Trade War is a ‘Lose-Lose’ Situation for Them and the World, Warn UN Economists,” *UN News*, (5 November 2019). Available at: <https://news.un.org/en/story/2019/11/1050661> (last accessed 30 November 2019).

A concept from social psychology that compliments this idea of cultural allegiance is the concept of naïve realism, which refers to our tendency to believe that we see the world objectively and without biases; and the corresponding belief that those who disagree with our view must either be ignorant or irrational, when in fact our perceptions are inevitably subjective⁽⁵⁵⁾.

If we can learn to appreciate the fact that people we vehemently disagree with or those that take positions that we find baffling are simply expressing who they are and by understanding our own cognitive idiosyncrasies like how we believe that our view and understanding of the world is somehow more objective than that of the others that is a start: A start to finding different ways to communicate with those that we disagree with, and in that process, perhaps learn to resolve our conflicts in a more meaningful, compassionate way. This is to suggest that we need more than data, facts, and, science to change how people behave, but we need to become better conversationalists and bridge-builders who can look at these issues more empathetically.

This section highlighted various instances where looking at the issue from a purely legal perspective or looking at a problem from only a singular narrative can lead us down a path of misunderstandings and escalated conflicts. Therefore, in order to im-

(54) Dan M. Kahan, "What people 'believe' about global warming doesn't reflect what they know; it *expresses* who they are," *The Cultural Cognition Project at Yale Law School* (23 April 2014). Available at: "<http://www.culturalcognition.net/blog/2014/4/23/what-you-believe-about-climate-change-doesnt-reflect-what-you.html> (last accessed 30 November 2019); see also, Dan M. Kahan, Hank Jenkins-Smith, and Donald Braman, "Cultural Cognition of Scientific Consensus," *Journal of Risk Research*, 14 (2) (2011): 147–174.

(55) Lee Ross and Andrew Ward, "Naïve Realism in Every Day Life: Implications for Social Conflict and Misunderstanding," in *Values and Knowledge*, Edward S. Reed, Elliot Turiel, and Terrance Brown (Eds). (New York: Psychology Press, 1996): 103–135 (citing to Asch's admonition that we "need to pay attention to the individual's subjective understanding of events" because there are "apparent differences in judgment about particular social objects [that] might actually reflect differences in the way those objects of judgments are being perceived or construed by different actors.").

prove the human condition and the state of the world that we live in, we must produce more versatile problem-solvers versed not only in one singular discipline, but a renaissance (wo) man, who can: 1) connect the dots across multiple disciplines, and 2) communicate empathetically when sharing their knowledge in a manner that is digestible for the rest of us. The next section will tackle the issue of how we can educate and nurture such a person.

4 . INTERDISCIPLINARITY AND LIBERAL ARTS EDUCATION

As noted in the previous section, lawyers and policymakers can benefit from looking at problems and disputes more holistically, not only from legal and economic perspectives, but by understanding different cultures and the history of any particular disputes while considering their sociological and psychological implications. This section will now make a complimentary argument that researchers and academics can enable and facilitate this change by conducting more interdisciplinary research. In addition, teachers and educators can further promote the development of future conflict resolvers capable of handling complex issues, by embracing liberal arts and global citizenship education into their curriculum.

4.1 Towards Interdisciplinarity

Section 2 of this article recommended that given the existence of P-value hacking or how subjectivity can creep into any research, we should always be careful not to swallow any single research wholeheartedly as the absolute, universal truth. Even if the research is conducted by highly esteemed professors and published in prestigious journals, *argumentum ad verecundiam* would dictate us to leave some room for skepticism. Only when the results can be replicated and verified should we believe that that research finding is shedding light on some aspect of the truth.

In the end, scientific findings we read has to be taken into context with other find-

ings, our existing knowledge, and to some extent, our values and intuition. Researching multiple fields of science or collaborating in an interdisciplinary team not only deepens our understanding of the world, but the process of sharing our knowledge with other scientists and researchers will enable us to reflect on our own research and thought process as well: As we say in education, teaching is the best form of learning. Conducting research across multiple disciplines in a collaborative teams or in an interdisciplinary manner can no doubt be time-consuming and burdensome, but in doing, so there are multiple benefits: For example, the synthesis of methods and insights from multiple disciplines can serve to cross-check one another, not to mention that cognitive diversity usually present in a collaborative, interdisciplinary research team will enhance the outcome and the validity of the research⁽⁵⁶⁾.

Take for example, the Nobel laureate, Akira Yoshino, who is a Japanese chemist that received the Nobel Prize this year for inventing lithium-ion batteries that charge most of our electronics today. What is surprising about Yoshino is that prior to studying chemistry and engineering, he studied archaeology, which “gave him a fresh perspective and broader view that helped him continue his studies... [Yoshino] said had he followed a different career path and pursued only one field of expertise, he wouldn’t have succeeded.”⁽⁵⁷⁾ This supports the claim that in some cases, it is these “deviations” or mixing of the various disciplines that lead to surprisingly fruitful insights and discoveries. This neatly leads into the subject of the next subsection, which is the importance of an interdisciplinary, foundational education.

(56) James Surowiecki, *The Wisdom of Crowds*, (New York: Anchor Books, 2004), at p. 277 (stating that his work “is not an argument against experts, but against our excessive faith in the single individual...”); cf. Cass R. Sunstein and Reid Hastie, *Wiser: Getting Beyond Groupthink to Make Groups Smarter*, (Boston: Harvard Business Review Press, 2015) (making the case that groups often tend to amplify some individual biases and heuristics mentioned in Section 3 of this contribution, which can result in bad decisions).

(57) M. Osumi, “‘Be Curious,’ Yoshino Tells Youth,” *The Japan Times*, (11 October 2019).

4.2 Liberal Arts Education Promoting 21st Century Skills

As noted in the previous subsection, interdisciplinary research, while challenging and time-consuming to set up and conduct, has an assortment of benefits. Similarly, a more interdisciplinary approach to education can also yield tremendous advantages for both students and teachers. Thus, merging liberal arts and global citizenship education together with a STEM (Science, Technology, Engineering, and Mathematics) curriculum can lead to the development of versatile and highly employable students, not only desired by perspective employers, but by civil society at large⁽⁵⁸⁾.

In the last decade, however, there has been a noticeable favoritism towards promoting STEM education, with various institutions cutting funding from other programs (e.g. liberal arts curriculum) to pour funding into programs linked with science, technology, engineering, and mathematics instead⁽⁵⁹⁾. To abandon one for the other, however, would be a grave mistake as it has been widely reported that skills that innovative companies like Google are looking for are not just STEM related skills, but soft skills that overlap with what is often referred to as global citizenship skills or 21st Century skills:

“The seven top characteristics of success at Google are all soft skills: being a good coach; communicating and listening well; possessing insights into others (includ-

(58) Casey Jones, “Interdisciplinary Approach — Advantages, Disadvantages, and Future Benefits of Interdisciplinary Studies,” *Essai*, 7 (26) (2010) (arguing that interdisciplinary studies will instill both students and their teachers with critical thinking, communication, creativity, and other desirable skills).

(59) See e.g., Adam Harris, “The Liberal Arts May Not Survive the 21st Century,” *The Atlantic*, (13 December 2018). Available at: <https://www.theatlantic.com/education/archive/2018/12/the-liberal-arts-may-not-survive-the-21st-century/577876/> (last accessed 30 November 2019) (noting that “[1] liberal arts staples such as English, Philosophy, political science, and history [had] to be eliminated from University of Wisconsin); see also, Alexandra Ossola, “Is the U.S. Focusing Too Much on STEM?,” *The Atlantic* (3 December 2014). Available at: <https://www.theatlantic.com/education/archive/2014/12/is-the-us-focusing-too-much-on-stem/383353/> (last accessed 30 November 2019).

ing others different values and points of view); having empathy toward and being supportive of one's colleagues; being a good critical thinker and problem solver; and being able to make connections across complex ideas."⁽⁶⁰⁾

Many academics and educators share the same sentiment or have heard from employers that they want versatile graduates that have experiences both in liberal arts and STEM education⁽⁶¹⁾. This is particularly a crucial revelation for those operating in educational systems that require students to select a specialization early on in their collegiate career such as Japan or the Netherlands. In many cases, students that end up selecting a specialization early have the tendency to see subjects outside of their specialization as superfluous and something that will not help them in securing a career in their chosen path⁽⁶²⁾. For example, we very rarely see a student in our bachelors of law program taking courses in mathematics, history, or natural sciences (e.g. physics or biology), as they suspect that taking such courses would take precious time away from their specialization, or worse, could potentially lower their grades, thus reducing their employability. If various reports on what employers are looking for is indeed true, our students' suspicions would seem to be incorrect and by not taking these "superfluous" courses, they could actually be lowering their employability.

(60) Cathy N. Davidson, *The New Education: How to Revolutionize the University to Prepare Students for a World in Flux*, (New York: Basic Books, 2017); as cited in, Valerie Strauss, "The Surprising Thing Google Learned about its Employees — and What it Means for Today's Students," *The Washington Post*, (20 December 2017).

(61) See e.g., Adam Harris, "The Liberal Arts May Not Survive the 21st Century," *The Atlantic*, (13 December 2018) (quoting Greg Summers of University of Wisconsin stating that "[w]e hear a lot from employers that they don't want to choose between graduates who have some technical ability versus a graduate who has a liberal-arts major... They really want both of these things.").

(62) T. Sawa, "Reforming Education for Society 5.0," *The Japan Times*, (17 October 2019) (stating that "it is next to impossible to have students receive a liberal arts education while they pursue subjects in specialized fields). Takamitsu Sawa is the President of Shiga University, located in the Kansai region of Japan.

Therefore, investing time in liberal arts and global citizenship education is not a detriment, but a chance for them to develop into better thinkers and complex problem solvers, which will likely increase their chances at meaningful employment⁽⁶³⁾. The proliferation of these holistically educated, civically engaged students could also become an important catalyst for our quest of improving the human condition and to transform the status quo of malaise and misinformation.

5 . CONCLUSION

Given the myriad of information available today, truth is often buried under layers of distracting noise. Rigorous scientific research takes time, grit, and a whole lot of resilience as it takes years of hard work and dedication to find undiscovered truths and ways of improving the human condition. This task is made even more difficult by the alarming number of shortcuts that researchers and scientists can take through P-value hacking or pay-to-publish-journals with no rigorous peer-review, which often ends up distributing half-truths or downright lies. When law- and policymakers lack the skills to distinguish good science from bad science, or worse, if they purposefully ignore the difference so long as it fits their political narrative, science can be abused to promulgate bad or ineffective laws and policies.

It is therefore crucial for law- and policymakers to be aware of their blind spots and to take active measures to develop a more holistic understanding of the world. They must learn to not only look at issues through a legal lens, but learn to integrate different perspectives from diverse fields of science, including but not limited to economics, sociology, and psychology. To facilitate this transformation, it is crucial for academics to

(63) T. Sawa, "Reforming Education for Society 5. 0," *The Japan Times*, (17 October 2019) (arguing that a liberal arts education "enable [s] students to enhance their ability to think logically, and to form normative judgments and acquire fundamental capabilities to identify and resolve problems or to conceive and design social systems.").

play an enabling role by conducting more interdisciplinary research that merges different fields of science together. To bring about a better tomorrow for us all, it is also essential for educators to adopt liberal arts and global citizenship skills into their curriculum that teach students — the problem solvers of tomorrow — important 21st Century skills such as emotional intelligence, ability to weave different concepts, active listening, and communication skills. After all, we are living through a time when having scientific facts on your side is not enough for people to listen, care, or even believe you. Therefore, we must educate our students, not only the skills to discover truths, but ways in which they can communicate that truth through a narrative that others would actually pay attention to and do something about.

To this end, Akira Yoshino — the aforementioned Nobel Prize winner in Chemistry — stated that “I want (younger researchers) to challenge the unknown and pave new ways, without following the paths of others... I want young people today to have bold curiosity.”⁽⁶⁴⁾ Venturing through the unknown and fighting off temptation to take easy shortcuts not only takes courage and dedication, but the curiosity to keep seeking for the truth and to never stop learning. It is in this spirit that we — the lawyers, the researchers, and the educators — must all keep broadening and deepening our understanding of the world as well.

—Mark T. Kawakami, Assistant Professor, Maastricht University—

(64) M. Osumi, “‘Be Curious,’ Yoshino Tells Youth,” *The Japan Times*, (11 October 2019).