



All the Education We Need

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Abstract

Moving from scarcity of knowledge and lack of access to information to an overabundance of data comes with a downside. It is difficult to establish the veracity and impartiality of information today. With increasing freedom for everyone to make themselves heard, personal opinions, prejudices, even falsehood come to be alongside facts. In such a scenario, it is crucial to educate youth to understand the mind, its faculties, limitations and untapped potentials. This will equip them to navigate the ocean of data while thinking for themselves and forming their own impartial decisions. Imparting knowledge is increasingly becoming a less significant part of education. What is critical today is to teach our youth to think for themselves, recognize and account for their own as well as others' blind spots, and become values-based, independent individuals who can lead society towards greater global human wellbeing.

“Can we allow our collective future to be determined by our ability and inclination to exercise our mental faculties to process a few words?”

In his book *A Memoir of Jane Austen* James Austen-Leigh talks of an English squire, a man of many acres, who asked Jane Austen's father, Reverend George Austen, 'You know all about these sort of things. Do tell us. Is Paris in France, or France in Paris? for my wife has been disputing with me about it.' This was the state of general knowledge about a neighbouring region among the gentry of a developed country in the 18th century. Two hundred and fifty years later, how are we better?

Or are we better? We know about Paris and France, but a closer look at the knowledge and understanding we possess in this age of information overload and hyper-connectivity reveals astonishing gaps. In the same country, in the Brexit referendum three years ago, Britons voted to *Leave* by a slim margin. But the analysis of the campaign, results and the events that have happened since raise fundamental questions about how we as individuals and societies understand, think and act.

Michael Dougan, Professor of European Law and Jean Monnet Chair in EU Law at the University of Liverpool, described the *Leave* campaign as '*degenerat[ing] into dishonesty*

on an industrial scale.* The campaign played on the anti-immigrant sentiments that had been surfacing in many parts of the world, and claimed among other things that Brexit would result in redirecting the £350 million that the UK sends to the EU every week to the country's National Health Service instead. UK's contribution to the EU, which is less than half the claimed sum, is information that is publicly available. A little research and thought will also show that much of it comes back to the country or results in savings in different domains. But the emotional impact of *Leave* was more powerful than logic and objective facts. The scepticism about remaining with Europe expressed by leading newspapers shaped public opinion. Effective use of social media by *Leave* activists influenced the vote. As if these factors that have nothing to do with objective facts were not enough unwanted influences on society, behavioural practitioner Warren Hatter feels that as a word "Leave" places less cognitive load on a person than the words "Remain a member of." The simpler word was acted on as it required less mental effort to process! Can we allow our collective future to be determined by our ability and inclination to exercise our mental faculties to process a few words?

If such was the condition before the referendum, Brexit regret afterwards shows greater confusion and inability to make up one's mind. The more details people have learnt about the exit and its consequences, the less they like it. The number of those who believe the referendum should be honoured is declining. In the beginning of 2019, there was a nine-point majority that believed that choosing to leave the EU was wrong. A second referendum may vote to *Remain*†. More than half the voting-age Britons think the first referendum itself should not have been held!‡

People being led by rhetoric, believing in something because everyone else does so, being unable to think for themselves, or tell truth from wishful thinking or even outright falsehood are restricted not to any region or socio-economic class in the world. The use and misuse of social media in the last American elections is an issue of international dimensions that is still being debated with just one year left for the next election. India is divided as to whether it is really at the onset of an economic recession or just a restructuring that will prove to be beneficial in the long term. False rumours of child kidnappings have led to mob violence and lynching of innocent strangers in the country. Pakistan had to suspend its anti-polio vaccination drive after rumours were spread about ulterior motives behind the drive. Climate change deniers continue to exist. We have more schools and colleges, teachers and textbooks, more students enrolled in education. Has it made us more knowledgeable?

We have all the data that we could possibly need and a lot more, but not the mental clarity needed to understand an issue and make decisions. The complexity and criticality of the challenges we face today are enough to convince anyone that rather than give more information to our students, we need to train them to think independently. We need to make original and independent research, problem solving, collaboration and group discussion a significant part of our educational pedagogy. The share that lectures and memorization have

* <https://news.liverpool.ac.uk/2016/06/22/transcript-professor-michael-dougan-eu-referendum/>

† Jim Edwards, *Business Insider* Feb 24, 2019, https://www.businessinsider.in/Polls-show-Brexit-regret-so-is-so-strong-that-Remain-would-win-a-second-referendum-by-9-points/articleshow/68140435.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

‡ Sam Hall, *The Guardian* Apr 27, 2019, <https://www.theguardian.com/politics/2019/apr/27/public-thinks-eu-referendum-was-a-bad-idea-says-poll>

in our classrooms must be reduced to the minimum. ‘Studying a lesson to pass the exam—passing the exam to get a certificate—getting a certificate to get a job’ is the route that has led us here. Let us show the next generation a better path. If we can create independent thinkers, we have given our future generations all the education they need.

How can independent thinking be taught? Independent thinking can be taught just as creativity or values can be, not through lectures but by fostering the right environment that leads to the development of the faculty in each individual. We need to have more conversations and fewer lectures in the classrooms. Give students open-ended questions, not answers. Without judgement, accept their ‘I don’t know’ for an answer. Let it not be equated with ignorance or foolishness. Intellectual humility makes for lifelong learners.

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We learn most when we teach others, so let students teach and learn from each other. This makes them more involved in classes and very often they learn better from their peers. Every positive initiative must be rewarded. When students are encouraged to take initiative and experiment, they become active learners rather than passive listeners. Even if they do not produce results or are not successful in their experimentation, teachers need to appreciate the attempt. It is antithetical to real education to punish mistakes and failures. If students are taught to analyze their mistakes and learn from them, we equip them to make progress all their lives.

One of the most important lessons Lee Iacocca said he learnt in business is that if all you are getting from your team is a single point of view—usually your point of view—then there is need to worry. He always kept some contrarians around, people who challenged and criticized him, those he could count on to be devil’s advocates. He found that they kept him on his toes, and induced him to improve himself, his products and his company.¹

When the teacher encourages dissenting views, and encourages students to make up their own minds on issues that have no one right answer, we raise a generation of independent thinkers. Warren Buffet’s advice for investing applies to thinking as well: “*Be fearful when others are greedy and greedy when others are fearful.*” Let us encourage exploration. When everyone is a conformist, society makes zero progress.

We need to teach students to ask questions. Let them question the authenticity of a news item and its source, before they accept, process, and spread it. 59% of links shared on social media have never been clicked.* Nearly 6 in 10 links get re-tweeted without users reading anything else besides someone else’s supposed summary or opinion of what the link contains. A 2018 study by MIT scholars proves the saying ‘*A lie travels around the globe while the truth is putting on its shoes.*’ It found that false news stories are 70% more likely to be re-tweeted than true stories are. It takes true stories about six times as long to reach 1,500 people as it does for false stories.† Apparently, sensationalism supplies the speed. A 2016 Pew poll found

* Maksym Gabielkov, Arthi Ramachandran, Augustin Chaintreau, Arnaud Legout. *Social Clicks: What and Who Gets Read on Twitter?* ACM SIGMETRICS / IFIP Performance 2016, Jun 2016, Antibes Juan-les-Pins, France. {hal-01281190}

† <http://news.mit.edu/2018/study-twitter-false-news-travels-faster-true-stories-0308>

that nearly a quarter of Americans said they had shared a made-up news story. We have fake political news, health scams, financial fraud, censorship and selective leaking of news. When we have headlines screaming something, a hundred television and radio channels repeating them with multimedia proof, thousands of websites picking them up, and social media adding personal angles to them, how do we tell the truth from the untruth, post-truth and lies? MIT cognitive scientist David Rand has found that, on average, people are inclined to believe false news at least 20% of the time.* Digital media complicates matters. It is not possible even for highly educated and tech-savvy users to easily make out a fake website from a real one. Whereas newspapers separate news from opinions, social media gives news from the personal viewpoint, often with the writer's prejudices and partialities thrown in. A book is usually vetted by a publisher, a list of citations provides a basis for what it claims. Websites can create virtually anything they want—official looking content, respectable but fictitious footnotes and endnotes, and any number of testimonials created by software code. Readers give weightage to the number of followers, likes, comments and shares on a page, but likes and reviews can be bought, followers may be bots. This makes it more important to be wary of online content. We need to tell our students not to accept anything at its face value, and that while judging the veracity of the content or its source, one's own prejudice and partiality must not colour their judgement. But as we teach students to question, we also need to teach them to do so without becoming cynical about everything.

Our thoughts are like the Mexican wave in a sports stadium. We think, feel or do something when we see many others do it. George Orwell's idea of Groupthink was not as strong in 1949 when he wrote the book, or in 1984 when the story was set, as it is in 2019. Theoretical physicist Lee Smolin describes the subtle pressure even among the scientific community involved in advanced research to conform to accepted theories instead of challenging them.² We need to teach our youngsters to stand bravely alone, not seek safety in numbers and security in what is already familiar.

Every century and every generation has faced changes and new challenges, only the acceleration of the change is more today than it has ever been. We find ourselves more and more in situations no one else has been in before. There will be times when nothing we have studied, experienced or known can serve us. Some ninety years ago, Franklin D. Roosevelt was in one such situation. His handling of the situation is a classic example of independent thinking. Since the Great Crash of 1929, more than six thousand American banks had failed. The panic led millions of Americans to line up at the remaining banks to withdraw their savings before those too declared bankruptcy. When Roosevelt became President of the USA in 1933, the country was in the midst of its most severe banking crisis. Every economic policy initiative applied in the previous three years had failed to stem the collapse. Roosevelt saw that money and economy are not the objective reality that they are considered to be. The collapse of the system was the result of subjective factors that could not be addressed by the government at the institutional or policy level. Without a precedent or proven strategy to rely on, Roosevelt went on public radio and addressed the people. He explained to his people that America still had all the resources that had made it prosperous—industrial infrastructure,

* Katy Steinmetz, *How Your Brain Tricks You Into Believing Fake News*, *Time* Aug 9, 2018, <https://time.com/5362183/the-real-fake-news-crisis/>

world market, abundant natural resources and hardworking people. The problem was their loss of confidence in themselves and faith in the country. He inspired them with the immortal words that there is nothing to fear but fear itself. He asked people to redeposit their money in the banks, and passed legislation instituting insurance of bank deposits and other safeguards. People responded to his inspiring call, and the panic ceased. Roosevelt was able to stem the crisis and he went on to turn the economy around.

“If we continue to go by the logic that if it could be done, it would have been done before, then nothing will have ever got done.”

Roosevelt saw the role of subjective reality in what appeared to be a purely objective issue. He realized the inadequacy of the principles of economics he had studied at Harvard to solve the crisis, and addressed people’s emotions. This is not to discount the value of Harvard or any university, but there are situations that compel one to transcend everything that is known in order to uncork the future. An open and unbiased mind can find solutions and workarounds to anything. We need to be able to show our youngsters the need to continually de-condition the mind, to question every assumption and theory. We must show them how to see the conceptual framework they are in, and how to step out of it when it no longer serves the purpose.

When Steve Jobs was CEO of Apple, he approached the glass works and technology company Corning Inc. to make Gorilla glass for the iPhone. The 160 year old company had developed the glass in the 1960s, but CEO Wendell Weeks believed that they did not have the capacity to produce the quantity required in the six months stipulated by Apple. Jobs assured Weeks that it could be done. Weeks, not Jobs, was the CEO of Corning Inc. Jobs knew little about Corning, the glass industry, or the requirements of manufacturing Gorilla glass. Still, he assured Weeks that there was no need to be afraid, if they got their mind around it, they could do it! Weeks took up the challenge. Almost overnight he converted a Corning facility into a Gorilla glass manufacturing unit, put the best people he had on the job, and met Jobs’ requirement.³ The interaction between one man who believed intuitively that something could be done, and another who decided to attempt what he did not think was possible led to the development of a globally iconic product and raised the standard for the entire industry. Imagine the possibilities when every one of our youth dares to think beyond what is known and proven.

Every instrument comes with a manual that describes what the instrument is used for, and what its margin of error is. We have used the mind for millennia without fully understanding its characteristics and limitations. An understanding of the tool we use to think and understand is as essential as all the academic knowledge we give our students. Our education must help them realize and account for the following:

- We are often unable to see what is imminent. It may be right in front of our eyes, but we see what we want to see. Mathematical economist and professor of Economics at

Yale University Irving Fisher was called “*the greatest economist the United States has ever produced*” by many including Nobel laureate Milton Friedman. His Fisher equation, Fisher hypothesis and Fisher separation theorem are still cited by economists. Fisher confidently predicted in 1929 that “*stock prices have reached what looks like a permanently high plateau.*”^{*} Three days later, the American stock market plunged leading to the Great Depression and ten years of gloom. For months, Fisher continued to assure investors and insist that a recovery was just round the corner.

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- Expertise in the field may still not prevent one from interpreting the signals wrong. “*It will be years—not in my time—before a woman will become Prime Minister;*”[†] Margaret Thatcher of all the people said this in 1969. She became Prime Minister of England in 1979.
- We refuse to accept what we cannot understand. President of the Royal Society in 1883 Lord Kelvin was sure that “*x-rays will prove to be a hoax.*”[‡]
- Wishful thinking clouds our mental faculties. Hiram Maxim, inventor of the first portable fully automatic machine gun, was asked by English scientist Havelock Ellis in 1893 whether the gun will not make war more terrible. Maxim replied, “*No, it will make war impossible.*”[‡]
- We are unable to visualize a future that is at variance with the past or different from the present. In 1878, the Chief Engineer of the British Post Office, Sir William Preece, thought the descriptions of the use of the telephone in America were a little exaggerated. He did not think Britain needed telephones because the country had “*a superabundance of messengers, errand boys, and things of that kind.*”
- Even in visualizing the future, we think based on the past. “*That the automobile has practically reached the limit of its development is suggested by the fact that during the past year no improvements of a radical nature have been introduced,*” wrote the *Scientific American* in January 1909.[‡]
- We believe that the unrealized is unrealizable. “*What, sir, would you make a ship sail against the wind and currents by lighting a bonfire under her deck? I pray you, excuse me, I have not the time to listen to such nonsense,*” Napoleon Bonaparte declared when he was told of Robert Fulton’s steamboat in the 1800s.[‡] If we continue to go by the logic that if it could be done, it would have been done before, then nothing will have ever got done. It is because there are people who reject this belief that we have almost everything that we use today.

^{*} Jennifer Latson, *The Worst Stock Tip in History*, *Time* September 3, 2014 <https://time.com/3207128/stock-market-high-1929/>

[†] *Margaret Thatcher: A life in words*, *The Telegraph* April 8, 2013 <https://www.telegraph.co.uk/news/politics/margaret-thatcher/9979399/Margaret-Thatcher-A-life-in-words.html>

[‡] *Six tech predictions gone wrong*, *The Economic Times*, September 04, 2015 <https://economictimes.indiatimes.com/six-tech-predictions-gone-rong/articleshow/48787590.cms?from=mdr>

- Change is almost always difficult to adjust to, even if it does not affect us personally. The President of the Michigan Savings Bank advised Henry Ford's lawyer, Horace Rackham, not to invest in the Ford Motor Company in 1903 saying "*The horse is here to stay but the automobile is only a novelty—a fad.*"
- When a thought seems familiar, and the words and expressions used are easy to process, we tend to ignore the details. In a study, only 12% of the students correctly answered the question "How many animals did Moses take on to the Ark?"* The answer is none, it was Noah's Ark and not Moses'.
- We take the easy option, for want of time or sincerity. When an image is used alongside a news story, the image catches our attention first, and we go on to read the story in the context of the image. So if the image is misleading intentionally or by chance, we misconstrue the text. We do not have the time or do not take the effort to read the entire article, so we construct the whole story from the image and headlines alone. Headlines are meant to capture our attention, not convey the whole truth.
- An article with an image of the human brain next to it is assumed to be accurate, even if the article is not related to the brain and provides no evidence for whatever it claims. Our mind keeps forming superstitions. A crowded shop must be selling good products. A product with more reviews and stars has to be good. A familiar brand must be trustworthy. We believe what we are exposed to in the past, or what someone we trust says. It requires a lot of mental courage to examine a concept that is at variance with one's personal convictions and established societal beliefs. We need to nurture boys and girls who can say the emperor is naked.
- We go by objective facts, and leave out the subjective aspect of reality. Going by the numbers on the balance sheets, experts have given such verdicts about the tech giant Apple's future that turned out to be incorrect. *The Economist* wrote on Feb 23, 1995 that Apple has two options, "*The first is to break itself up, selling the hardware side. The second is to sell the company outright.*" Michael Dell, CEO of Dell, was clearer in 1997 when he declared, "*What would I do? I'd shut it down and give the money back to the shareholders.*"† Without learning from the recent past, we often repeat the same errors. In 2006, David Pogue wrote in *The New York Times*, "*Everyone's always asking me when Apple will come out with a cell phone. My answer is, 'Probably never.'*" Even after Apple launched one, Steve Ballmer said in 2007 in *USA Today*, "*There's no chance that the iPhone is going to get any significant market share.*" But Steve Jobs was able to understand that a company's future is not determined by its hardware, balance sheet figures or the existing market conditions. People need user friendly gadgets that will serve them. Once they overcome their fear and doubts about the machine, he knew he

* Hyunjin Song, Norbert Schwarz, *Fluency and the detection of misleading questions: Low processing fluency attenuates the Moses illusion*, *Social Cognition*, Vol. 26, No. 6, 2008 https://dornsife.usc.edu/assets/sites/780/docs/08_sc_song_schwarz_moses.pdf

† John Markoff, *Michael Dell Should Eat His Words, Apple Chief Suggests*, *The New York Times* Jan 16, 2006 <https://www.nytimes.com/2006/01/16/technology/michael-dell-should-eat-his-words-apple-chief-suggests.html?mtrref=undefined&gwh=B147C0964B917F1C12BAF5C30E9498E8&gwt=pay&assetType=REGIWALL>

could create new markets where none existed. He positioned his company so as to ride the wave of societal aspiration.

- Our ego blinds us to our defects and weaknesses. Similarly, we are ignorant of our unrealized potentials. The fall of every dictator verifies the former. The sudden rise of great leaders during times of national and global crises proves the latter. To know thyself is ultimate wisdom.

Understanding the workings of the human mind is not just of intellectual value, it is critically essential to see our way out of the many blind spots that trap us. Society has always been led by individuals with strong, value-based independent thinking. We need an education that releases such individuality in everyone.

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Notes

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6. Angela Royston, *Robert Fulton and the Steamboat* (ebook; The Rosen Publishing Group, 2016)