

Dark Patterns and Epistemic Ignorance: An Educational Crisis

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Abstract: In this paper, we discuss how online AI stimulates epistemic ignorance. Early visions of online information search and retrieval processes proposed a utopian and empowering space for individuals. Today's crisis paradoxically presents us with an unprecedented accumulation of new information and access to it, yet also the colonisation of this knowledge by those who seek to erode critical thought. By 'epistemic ignorance', we mean the condition which is systematically created by the patterns of mis- and disinformation that prevent knowledge seekers from gaining verified knowledge. We argue not only has the 'knower' or knowledge seeker become the 'known' (sometimes without knowing it), their ability 'to know' is also intentionally manipulated by dark patterns. Moreover, their 'known' status allows for their subtle indoctrination, and erosion of criticality. This makes the crisis an educational one. To illustrate, we consider epistemic mechanisms on Facebook pertaining to the early stage of the Covid-19 pandemic. We contend these 'dark AI patterns' intentionally aim for systemic indoctrination, and affective indoctrination, by engaging in the construction of epistemic ignorance. Our focus is on the political agenda; which is common in the wider discussion of indoctrination in education. Many educational philosophers have taken a critical interest in the power of education to indoctrinate. The formal educational space is an effective vehicle to do so – and now the informal education we receive through social media is as well. Through algorithms, we are taught to think a certain way. This new crisis has not yet been considered an educational one, while in every moment, the coercive powers of online AI drive audiences towards greater uncritical acceptance of knowledge and information. Perhaps we can reverse the educational oppression with the introduction of 'light patterns'.

Keywords: dark patterns, education, epistemic ignorance, digital literacy, indoctrination

1. Introduction

In 1965, ARPAnet pioneer J.C.R. Licklider wrote in his book *Libraries of the Future* about the challenges of designing information search and retrieval systems. Such technologies today manage an almost unfathomable amount of information on what we know as the World Wide Web (WWW). Internet search engines materialise the idea of having every piece of information 'out there' at your fingertips, in the comfort of your own home, or on small devices on-the-go such as smartphones. This makes accessing information easy and intuitive, which in turn enables human beings to be empowered to act in accordance with their own free will. Content algorithms further regulate this on social media, by human tactics such as hashtags, for example, or automated suggestions of information 'relevant to you' based on previous searches, or social prompts by other people in your network ('likes', for example). Those are some of the underlying principles of Web 2.0, presenting us with a participatory, user-generated knowledge horizon.

At one level the development of technologies follows a utopian vision that true learning is based on curiosity, exploration and a self-steering, individual pursuit of knowledge, where the learner is in control over the mechanisms by which information is accessed and synthesised. In this article, we consider 'information' as a pattern of organised data on a given topic, and 'knowledge' as the information that has been processed by a person, allowing the knower a capacity to act (MacFarlane, 2013). Today's online information dynamics perpetuate this idea of the human being as an autonomous agent who learns new information in the pursuit of knowledge. However, and arguably to a much greater extent, those who seek knowledge have in turn become the passive subjects of data surveillance (information about them has become the 'known') which in turn influences the knower's critical reasoning abilities (the ability 'to know'). In this paper, we argue that we are educated into becoming tools through the use of our tools, and slowly our capability to return to being independent tool-users is eroded.

The pervasive quality of data surveillance effectively means that information about the 'knower' has increasingly become 'the known'. The WWW was originally envisioned as empowering to the individual's epistemic horizons space (meaning, their range of knowledge in itself). Instead, it has become a sphere of indoctrination. Affective indoctrination will influence and persuade the human mind to stay connected. In a 1958 interview about the future of surveillance, Aldous Huxley commented that 'these new techniques of propaganda will bypass the thought of rational side of man and appeal to the subconscious and deeper emotions and his physiology even

and so making him actually love his slavery' (Huxley, 11:04-11:18). This affective 'hook' allows for epistemic oppression. The more data is gathered about users, and the stronger the appeal to the subconscious and the emotions of users, the stronger the influence upon the users' critical reasoning abilities. To the *Brave New World* author and social critic, this establishes the power of the enemies of freedom, and leads to the potential for digital tyranny. For the following paper, it is these the 'dark patterns' of epistemic oppression which we'll consider, in the form of hegemonic Artificial Intelligence, or AI (Ricaurte, 2022), operating as algorithmised information delivery systems on social media. While we consider the intelligent, automated functions of AI as key to the dark patterns, we recognise AI as a component of a social web of 'actors, relationships, interests, social norms, cultural practises and institutional arrangement' (Ricaurte, 2022:728) and similarly, algorithms as technical operation as well as the basis for sociocultural mediation.

The operations of AI and the development of intelligent algorithms which operate within social media, can be likened to the known principles of indoctrination. Not only do users remain 'hooked in', they are also continuously and repeatedly drip-fed exclusionary realms of knowledge by human or algorithmic agents (which, at some level, are still human as they have been developed, designed and implemented by humans). While these principles have been critically highlighted in formal and informal education (such as film and advertising), it is less well-considered for the online space as an *educational* crisis. According to Edward Bernays, 'in theory every citizen makes up his mind on public questions and matters of private conduct. In practice if all men had to study for themselves the obtrusive economic, political, and ethical data involved in every question they would find it impossible to come to a conclusion about anything. We have voluntarily agreed to let an invisible government sift the data and high-spot the outstanding issue so that our field of choice can shall be narrowed to practical proportions.' (Bernays, 2005: 38) In this paper, we propose that present-day AI and algorithms perform that function in steering our everyday engagement with online platforms. We consider it specifically as a systemic indoctrination towards epistemic ignorance. In other words, we are indoctrinated to 'not know'.

In what follows, we will illustrate through the analysis of Meta (previously Facebook) as an information platform, with regards to the information circulation about Covid-19 in the early stages of the 2020 pandemic. At this stage, people heavily relied on public media for any knowledge and information about this eventful circumstance. It has been characterised 'an infodemic' by the World Health Organisation (Cheng, Ebrahimi & Lau, 2021). This epistemic urgency (or need for knowledge) provided an immediate opportunity for indoctrination. Firstly, we discuss indoctrination as an educational aim, with the erosion of critical thought at its core. We then consider dark patterns and how they teach us to process information uncritically, while becoming the 'known' ourselves. This brings us to the consideration of epistemic ignorance as a precursor to epistemic (social and political) injustice. People have a right 'to know'. In this regard, we favour the term 'epistemic' over 'epistemological' because it relates to knowledge in itself (and the shifting of knowledge, knower to known, intentional reshaping of knowledge,...), rather than the study or philosophy of knowledge formation (or what it is 'to know', why it is good 'to know', how human understanding or knowing happens,...) – though we also recognise these terms are sometimes used interchangeably across literature. In the final section, we consider principles of human learning and development which could overcome oppressive educational forces and empower the knowledge seeker.

2. Education and indoctrination

The topic of indoctrination through education has a long history in the study of education, pedagogy, politics, and power – and yet it is still a much-debated topic in recent literature (Taylor, 2017). It goes perhaps to the core of an ethical positioning that education should stimulate the individual, critical mind, and therefore indoctrination in this context would be a corrupting practice (Bista, 2018). Yet it's also been recognised that some indoctrination in education may be politically desirable, and have a positive effect, or is otherwise inevitable (Dahlbeck, 2021; Zembylas, 2021). In a study on scientific indoctrination through public media, Sethi (2012) argues that 'educating is the act of presenting facts with a biasing context, while informing is simply the presentation of facts, with no biasing context. [...] a third option: indoctrination, or the act of presenting only a biasing context' (p.4). Whereas the ARPAnet pioneers envisioned the second option, unbiased *information search and retrieval systems*, what we have today is at best the first option: 'to push the public to view and act on that information in a particular way - an educational approach would be the likely choice' (p.4). However, 'the public is irrational and easily manipulated, then indoctrination techniques are a natural recourse.' (p.4). Here, Sethi (2012) describes the public communication efforts by the Federation of American Scientists, or FAS. Following World War II, the American public had to urgently gain new knowledge about atomic threats. FAS

found some indoctrination effort was necessary despite their initial ‘faith in the central role of a rational public in a democratic society’ (p.4). So, indoctrination is sometimes considered necessary, even the right or good thing to do. As a result, critiquing educational indoctrination as an issue in itself can become a complex debate. However, scholars agree that indoctrination in education becomes unethical when it seeks to override critical human agency.

For example, a ‘peace education curriculum’ was implemented in the Netherlands in the 1970s, which explicitly addressed topics such as nuclear weapons and the Vietnam War. The many accusations of indoctrination it received were partly based on the necessity of ‘taking sides’ on right and wrong in these global, political affairs (Amsing & Dekker, 2020). The curriculum specifically aimed to ‘change attitudes’ of the young minds in this formal educational space, which could be said to be a key purpose of indoctrination agendas. A similar purpose is outlined for the context of the 1960s Soviet regime in Lithuania by Naudžiuniene (2020), informing a political vision of the ideal citizen in a singular value curriculum.

While both examples show an intentional and purposeful political agenda which utilises education as a way to shape individual and social knowledge frameworks, they are also different in one key respect. Amsing & Dekker (2020) conclude that the Dutch approach provided nuanced knowledge and information, stimulated exploration, encouraged appreciation for diverging views and complexity, revealed powered mechanisms, and so overall, built the ability to think critically. Following Sethi’s (2012) categorisation, it would therefore align more closely with ‘educating’ rather than ‘indoctrinating’. To Naudžiuniene (2020), the crucial issue is ‘the orientation of teaching towards fiction and simply ignoring reality’ (p.43). The information delivery context painted an illusionary framework of knowledge to be uncritically accepted, even though it was fictitious.

It is this latter example which shows the creation of epistemic ignorance through education, which poses a crisis. In recent times, we can see a rising awareness on how formal education and information retrieval sometimes closes the horizon of knowing (Charles, 2019), but also in knowing how that horizon was formed. This creates social inequity, which shows the need to decolonise this horizon of knowledge. Still within social media, misinformation is rife but perhaps that is not the most urgent issue. Instead, let’s move to consider the ‘dark patterns’ and their underlying agendas which colonise our framework of knowledge.

3. Dark patterns

The issue of colonisation provides a useful lens for our analysis. The political notion of colonisation provides the background for how educational indoctrination can be conceived to be a form of mental colonisation. According to Robert J. C. Young, ‘colonisation, therefore, as practiced and conceptualised in Europe, was at once a trading enterprise, a quest for resources, and a form of migration of people who left their homelands and established themselves elsewhere in the prospect of a better life.’ (Young, 2015: 31) It is clear how formal education systems have played a powerful role in that prospect-seeking pursuit of knowledge, as well as the coloniser’s aim of creating a singular framework of knowledge. If these distinctions are applied to knowledge seekers using social media platforms to gain knowledge it would be interpreted as a trading enterprise. The knowledge seeker would engage in an exchange with the social media company in order to gain a better life through the acquisition of knowledge. What the social media company gets in exchange for providing the knowledge seeker with knowledge is data related to information about the knowledge seeker. In the context of the Covid-19 pandemic, especially the early stages, we experienced a unique combination of the urgent need for knowledge in view of public health, and a still-evolving scientific understanding. The pursuit of knowledge online became an arena of health education, yet riddled with misinformation, fake news, conspiracy myths,... (Stephens, 2020).

In a study on changing viewpoints through new information and knowledge processing, McKay et al. (2020) found that no participants searched for scientific or statistical data as their first information source. Only three of eighteen participants did so after other information sources had begun to change their views. The study shows the complexity of engagement with information sources, and the difficulty of reflection on how viewpoints are formed. Some participants demonstrate conscious tactics to overcome echo chambers, others did not feel they were part of one. Central to the conclusion is that: ‘No change of view began with search [...] the view changes predominantly began with monitoring and encountering: search came later to look for specific information to support making the decision to change views’ (McKay et al., 2020: 8). This is a key difference to ARPAnet visions, in that it is not an information search and retrieval – which implies active human agency with intent. Instead, it is an information delivery of sorts (in the ‘feeds’). That delivery, even in its simplest form, has been designed. It

is an arena ready for colonisation by 'the deliverer'. Intelligent algorithms don't randomly construct the feeds. Instead, they are formed on the basis of the data about the known user; the minute detail of that person's likes and preferences, other people they follow, what those people liked and posted, larger platform trends, the platform's business model, the developers' bias, the platform company's CEO's political views, ... So there is a complex underlying force that shapes the information. The prevalence of calls for greater transparency show how mysterious those underlying forces have become. According to De Chant (2021: np) 'they need to open up the black box that is their content ranking and content amplification structure.' Yet this would run counter to the intentional production of epistemic ignorance which benefits the coloniser. Facebook's unwillingness or inability to understand the scope of COVID misinformation on its platform was apparent in comments it gave to the New York Times in which it blamed platform nescience on the pandemic knowledge gap: 'the suggestion we haven't put resources towards combating COVID misinformation and supporting the vaccine rollout is just not supported by the facts,' said Danny Lever, a Facebook spokeswoman: 'with no standard definition for vaccine misinformation and with both false and even true content often shared by mainstream media outlets potentially discouraging vaccine acceptance we focus on the outcomes measuring whether people who use Facebook are accepting COVID-19 vaccines.' (in : De Chant, 2021: np). It is true that at this time, science was still developing Covid-19 health education (Skorbug & Friesen, 2021). It offered a knowledge arena. Colonising dark patterns do not forefront the knowledge seeker's best interests, but rather seek to benefit the colonising influence. So the search for knowledge is utilised to introduce a shifting focus on the knowledge seeker as the known.

Young goes on to say, 'colonial rule inevitably created the distinction between coloniser and colonized, between colonials and colonial subjects. This division masked the fact that in settlement colonies that there were really three groups: the colonised natives, the colonial rulers who came from the metropolitan center, and the settlers.' (Young, 2015: 34). In the context of educational colonisation there are three categories that can be identified. There is the audience subject to educational colonisation (e. g. those who passively use social media platforms), those performing the colonising (e. g. social media platforms employing AI) and those actively and critically pursuing knowledge within social media platforms. Critical thinking is key to resist indoctrination, yet algorithmic influence on social media educates people towards uncriticality. The erosion of criticality affects the knower's ability to distinguish a piece of true information versus misinformation. However, the epistemic ignorance is the bigger issue, as it confuses understanding how the horizon of knowledge was formed.

For example, social media often induces 'a bandwagon effect', through hashtags, likes, re-posting mechanisms, ... This generates a sense of social proof of knowledge through crowdsourcing, meaning it is more likely to be accepted as true. In the context of Covid-19 vaccinations, Winter et al. (2022) found that people are more likely to be pro-vaccination if their social context is as well, and that this effect is strong enough to override pre-existing 'conspiracy mentality'. The study recommends the social context as a leverage to reduce vaccine hesitancy. This would seem a dark pattern technique, as they are known manipulative forces that confuse individual critical thinking, affect their knowledge and understanding, and directly influence decisions. With a sample of nearly 2000 participants, Luguri & Strahilevitz (2021) show that such dark patterns are indeed effective in influencing a person's thinking and decision-making. But crucially, dark patterns do not intentionally lead to knowledge and decisions which are in that person's best interests. (They may do so as an unintentional effect.) Sethi (2012) showed that indoctrination for the delivery of scientific insight is sometimes considered necessary, even good if considered in the public's best interest. But the FAS did not aim for the disempowerment of the knower or knowledge seeker by transforming the value of people into a 'known', and a disregard for the pursuit of knowledge, or knowledge itself.

4. From epistemic ignorance to epistemic injustice

So proprietary AI actively constructs the background and horizon of knowledge, with the underlying mechanism of educational indoctrination. In the contemporary context of our information storage and retrieval processes, we are not the autonomous agents of inquiry we believe ourselves to be. We are *taught* and conditioned to believe certain things, to the exclusion of others. We are actively discouraged from critical exploration and critical thinking, and instead stimulated to accept an illusionary single-truth framework. This is much like the indoctrination principles described by Naudžiuniene (2020) for the 1960s Lithuanian Soviet regime. However, the situation has evolved. A new level of learning is taking place, as explained in the previous section: the knower has become the known, and their critical capability in search of knowing is eroded. Individuals using the WWW and Internet are being channeled to think in certain ways while they are simultaneously under continual surveillance, and hindered in their ability to regain their status as knowledge seeker or knower.

In relation to indoctrination and education, Taylor (2017) crucially discusses a systems-based theory. She defines indoctrination as ‘a complex system of teaching in which actors with authority contribute to the production or reinforcement of closed-mindedness’ (p.40). Her emphasis of the threat is two-fold. Firstly, she contends the harm of indoctrination is not particularly related to the fragmented pieces of knowledge which may be false or true, single-truth or complex. For example, it is perhaps not so significant that one well-known journalist insinuated on her Facebook account that Covid-19 vaccines could cause female infertility (Adekunle & Mohammed, 2022). Instead, the threat is more fundamental. It is the algorithmised web of truth and untruth created by the underlying political agenda, enabling the affective indoctrination and epistemic ignorance, which teaches individuals to uncritically become the known. McKay et al. (2020), discussed in more detail in Section 3, show how complex this web of developing or changing views through information sources is today. This harms people’s understanding of themselves as individual, autonomous agents, as Taylor (2017) and McKay et al. (2020) contend. Secondly, it’s not enacted in narrow teacher-student, classroom-based scenarios as most literature of educational indoctrination considers. It involves a multitude of actors, each contributing a small piece to the larger systemic pattern of epistemic ignorance. The overarching intent is to instill a narrow, uncritical mindset – whatever the purpose, be it commercial (to click on certain advertising, buy certain products, enhance customer insight,...) or political (to persuade voting a certain way, instill opinions,...) or religious (believe certain things, supersede fact,...).

It is also worth noting that these dark patterns will have an adverse effect to those already the most disadvantaged in critical information search and retrieval. For example, Pickles et al. (2020) researched the likelihood of misinformation beliefs amongst the Australian public. Polling a large sample, they concluded that younger people, male, of lower education, and with a home language other than English are more likely to endorse misinformation. Young men for example were more likely to agree that hot temperatures kill the virus, and that Ibuprofen will exacerbate it (Pickles et al., 2020:np). Similarly, Luguri & Strahilevitz (2021) shows that less educated people in a large American sample were more vulnerable to dark patterns, especially where very subtle patterns are deployed. So there are distinguishable demographic or socioeconomic characteristics which will worsen the epistemic injustice (Byskov, 2021).

The education towards an uncritical mindset is the greatest danger here. As Sunstein (2021) contends, we cannot fully suppress lies, fake news and falsehoods online, but censorship should not be the primary aim of a free society anyway. The crisis occurs, as this paper argues, when the dark patterns aim for indoctrination, which overrides the development of criticality. Section 2 on education and indoctrination showed a key educational principle that moves away from indoctrination, which is to introduce nuanced knowledge and information, stimulated exploration, diverging views,... Though social media would seemingly be the ideal communication platform for this, research on echo chambers and filter bubbles has shown otherwise. In the context of Covid-19, Thiele (2022) analysed over 25.000 Facebook posts with 1.4 million corresponding user comments from German and Austrian people. He concludes ‘the very basis for debates in the comments section gets lost’ (p.193) as one-sided conclusions have already been drawn prior to any debate. Instead of a purely regulatory crisis, it is an educational issue. Not only does it affect a person’s understanding of how their knowledge horizons are formed or how it affects their personal viewpoints, it also hinders their understanding of their own rationality. To combat this, perhaps educational principles can also provide a way forward.

5. Educational hope

Long-term effects of indoctrination are indeed noticeable through unshakeable individual beliefs, or remnants of those frameworks of thought, and related social behaviours (Taylor, 2017; Naudžiuniene, 2020). While it could be said that some ‘programming’ is taking place through the educational indoctrination of AI-powered search and information retrieval, we must also maintain that human beings are fundamentally not robots. Current mechanisms do not preclude the possibility that indoctrinated people can overcome the educational effect of the dark patterns ; history shows that despite such indoctrination, liberation of minds is possible. Resistance to that closing of horizons can be seen in the aforementioned movements of decolonising and diversifying curriculums.

Understanding how the dark patterns work is part of the general calls towards greater transparency which we find in AI ethics debates today. In relation to overcoming epistemological ignorance, Bhatt & Mackenzie (2019: 305) state that: ‘Without knowing just how such platforms work, how to make sense of complex algorithms, or that data discrimination is a real social problem, students may not be the autonomous and agential learners and

pursuers of knowledge they believe themselves to be.' So online information retrieval processes must be driven by conscious engagement, and lead by the understanding that the horizon of knowledge is not neutrally constructed. Educationally, an additional step is needed: a person 'must be open to the intellectual good. She must be receptive to opportunities to improve her knowledge and understanding' (Taylor, 2017: 47). More so than *knowing*, people must learn to *care*. This requires criticality (or the ability to reason critically) – but also a value framework which is not neutral towards the epistemic ignorance towards which the dark patterns educate. Stockman & Nottingham (2022) for example counter the dismissal of surveillance capitalism in schools as a problem. They critically raise the current digital literacy curriculum as insufficient to educate for the required criticality that would oppose the indoctrination effect described in this paper. Similarly, online AI can play a role in educational hope. McKay et al. (2020) for example conclude that people do value nuanced information and should be supported *by design* to make free choices and formulate reflective knowledge. AI could meaningfully enrich the early visions of information and retrieval, in a way that supports human rationality and criticality. As opposed to 'dark patterns', perhaps we can consider these the 'light patterns'. It overcomes the epistemic injustice because it restores to the knower or knowledge seeker their capacity to know. While we recognise this as a techno-solutionist proposal, which has its own limits (Ricaurte, 2022:729), it does revive the ARPAnet spirit of technology's positive democratic potential in the human pursuit of knowledge.

6. Conclusion

In this paper, we traced a difference between the early ideas of information search and retrieval, to the principles of using information to educate, and then to indoctrinate. Educational indoctrination relies on the manipulative erosion of criticality, which we see in the algorithmisation of information disseminated on popular social media. The Covid-19 pandemic illustrates a pressing time of information exchange and serves to critically illustrate the wider epistemic crisis. Here, the image of 'the knower' emerges, and their pursuit of knowledge which fits an education that emphasises autonomous discovery and rationality. However, the dark patterns that operate the information systems within the WWW web (particularly, social media such as the popular Meta/Facebook) actively turn 'the knower' into 'the known'. These algorithms perform according to educational indoctrination principles, stimulating the epistemic ignorance on how knowledge is constructed and presented to them, how it influences a person's changing viewpoints, and muddles their understanding of their own rationality. In this sense, a colonisation of information takes place which benefits from the systematic production of epistemic ignorance. The educational crisis is that this artificial manipulation erodes human criticality. In educational literature, this has been central to distinguishing education from indoctrination. To overcome this, perhaps 'light patterns' can offer some educational hope. As opposed to 'dark patterns', intelligent algorithms could meaningfully enrich education towards the development of greater criticality.

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