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Published online: 20 Feb 2019.

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Just Google it! Digital literacy and the epistemology of ignorance

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ABSTRACT

In this paper we examine digital literacy and explicate how it relates to the philosophical study of ignorance. Using data from a study which explores the knowledge producing work of undergraduate students as they wrote course assignments, we argue that a social practice approach to digital literacy can help explain how epistemologies of ignorance may be sustained. If students are restricted in what they can know because they are unaware of exogenous actors (e.g. algorithms), and how they guide choices and shape experiences online, then a key issue with which theorists of digital literacy should contend is how to educate students to be critically aware of how power operates in online spaces. The challenge for Higher Education is twofold: to understand how particular digital literacy practices pave the way for the construction of ignorance, and to develop approaches to counter it.

Introduction: literacy, knowledge creation and ignorance

Over the last 15 years, the broad and interdisciplinary field of Literacy Studies has turned its attention to digital literacies and language online (e.g. Barton and Lee 2013; Gillen 2014). This growing body of work has explored what digital literacy looks like in particular localised contexts such as college classrooms (Bhatt 2017a), gaming environments (Gee 2014), and university student experience (Gourlay and Oliver 2018). And while there has been some notable research which has examined writing in Higher Education and its role in the work of knowledge creation (e.g. Tusting et al 2019) there has, as yet, been little that has examined specifically the relationship between practices of student digital literacy and the social production of ignorance – a field of inquiry that is outlined in detail below.

In this paper we argue that Literacy Studies, through its empirical work and ethnographic commitment, should engage with epistemologies of ignorance in understanding how ignorance can be maintained, produced and re-produced through practices of digital literacy in the everyday lives of individual users of technologies within their various networks and institutions. Our focus here is on Higher Education, and our data is drawn from a study of digital literacy in university campus sites. Using ethnographic

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interviews alongside a detailed videography of the writing process, the study examines how students in different disciplines (STEM, Computer Sciences, Arts & Humanities and Business courses) attempt to make sense of the plethora of information they encounter online. This includes how they search for information, engage with it critically (or not), and make evaluative judgements about its credibility and relevance to curricular work and assignments. We explore how students appear to engage in digital literacy practices which demonstrate forms of non-culpable and strategic ignorance. But first, we orient the general reader to our twin theoretical bases: first, a 'social practice' approach to digital literacy, and second, epistemologies of ignorance, particularly in relation to the power of algorithms to determine, produce and maintain knowledge.

Literacy and knowledge production

Literacy Studies emerged through a series of seminal works (e.g. Street 1984; Baynham 1995; Barton and Hamilton 2012) which collectively presented a social theory of literacy. This theory foregrounds the idea that literacy is always associated with, and realised through, 'social practices' rather than a purely formally-schooled understanding of correct language. This means that literacy is always embedded within social activities, is socially situated, and mediated by material artefacts and networks. Germane to its methods is to focus on what people actually do with texts and technologies, and how literacy practices are connected to getting things done in everyday life. Literacy research, therefore, invites careful and ethnographic attention to social acts of meaning ascribed to everyday practices of reading and writing.

Literacy Studies begins with the local and everyday experience of literacy in particular communities. It is rooted in people's intimate experience with text and this is not always predictable from one person to another. There are also different literacy practices in different domains of people's lives, whether through, for example, formal learning, religious activity, or family life. Literacy is, therefore, to be understood in a pluralistic sense: 'literacies' to which, in addition, digital media also adds plurality; and how students use digital technology will vary across different social, age, and subject groups. Students are faced with an increasing range of digital platforms with which to work, and an often unpredictable set of social and material resources which shape their writing and knowledge production. This is particularly salient in institutional environments where there is often an attempt to standardise curricular work by organising it around a virtual learning environment (VLE) that all are mandated to use, and large computer suites.

Researchers working within Literacy Studies have examined, in various ways, the cultural connections between the nature of knowledge (how it is produced, valued, and bequeathed), and the literacy practices of particular communities. Through Literacy Studies, we have come to know how literacy is intrinsically connected to how societies operate and are organised, how institutions, groups and individuals organise their lives and make sense of the world, and how these realities are produced and re-produced in and through practices of literacy.

Literacy, therefore, cannot be seen outside of the powerful interests and agencies which seek to define it in particular ways (Tett, Hamilton, and Crowther 2012): literacy is a profitable and fertile resource which can be sponsored, bought and sold, and regulated, suppressed or withheld (Brandt 1998). As Brandt defines it, the 'sponsors' of literacy are

'any agents, local or distant, concrete or abstract, who enable, support, teach, model, as well as recruit, regulate, suppress, or withhold literacy – and gain advantage by it in some way' (1998, 166). Whether they are community leaders, academic institutions, or technology companies, they ultimately control 'the ideological freight that must be borne for access to what they have' (168).

Sponsors also shift over time, and where the chief sponsors of literacy were once religious institutions who controlled how and where literacy was taught (and still do in many parts of the world), they have since been eclipsed by new sets of sponsors in the guise of businesses and the digital technology industries. These new actors have shaped current literacy demands in ways which are relevant to this research, as we will discuss below.

Brandt's ideas are relevant in today's digitally infused world where information is organised and made accessible to those who seek it online through search engines such as Google. Companies such as Google, through their computer code and artificial intelligence systems, are among today's highly influential 'sponsors of literacy'. Their digital platforms are conduits of economic and political forces which regulate and establish the value and agentive potential of people's digital literacies as they use those platforms (Noble 2018).

Drawing from a social practice approach to literacy, this study examines digital literacies as 'the constantly changing practices through which people make traceable meanings using digital technologies' (Gillen and Barton 2010, 1). A social practice approach to digital literacy does not, therefore, assume a deterministic and predictive relationship between digital media and students' writing and study practices. As Gillen and Barton (2010, 1) caution 'many mistakes – at the design, commercial and indeed theoretical levels – are made through assuming that there is a straightforward relationship between what a new technology can do and how – or even whether – it will then be used'. Instead, a social practice approach to digital literacy begins with detailed exploration of digital literacy in the lives of those who use technologies over and above an a priori notion of 'what works'. In this respect, a social practice approach to digital literacy is set apart from related perspectives (e.g. 'information literacy' and 'media literacy') which conceptualise literacy as a metaphor for autonomous skills which can be acquired and transferred from one domain to another. A social practice approach is important in institutions, such as universities, where large-scale investments are made in new digital technologies, and where there seems to be little or no examination of what digital literacy actually looks like in practice for students and staff. The ways in which learners embrace a suite of institutional technology is not always reflected in the intentions of investors or policymakers who will likely evaluate its use exclusively within broad instructional frameworks which tend to define digital literacy through a categorical classification of something which students *have* (or have not), rather than something which they *do* (see Gourlay and Oliver 2018).

Further, ignorance of how digital technologies work, how users' online activities can be used to the advantage of the platform owners or sponsors without the users' knowledge, and, indeed, how the internet appears to be structured so as to encourage people who enter it to confine their browsing to opinions they already accept, is not always well understood. Similarly, how people make sense of the voluminous amounts of information online is not straightforward. The sheer extent of online information necessitates its 'pre-curation' (Bhatt 2017a), or filtering, by algorithms before it is consumed by online users. Yet,

ignorance of how digital technologies and online platforms do this has resulted in *ritualised* practices of digital literacy which must be examined critically and not taken for granted as mere everyday online practice. As we shall shortly demonstrate, some forms of ritualisation are necessary, and relate to how an online user accords epistemic trust to actors (e.g. teachers, search engines) as they seek information for learning and knowledge production. But an exploration of students' ritualised practices with digital media can help uncover asymmetrical relations of power in moments of digital literacy and where, and how, epistemic trust is being granted.

Moreover, given that internet platforms are designed by corporations, they will be influenced by motivations, values, and intentions that are embedded in their architecture (Origgi 2012). However, because that design is often diffuse, it is difficult to know whom to query when these features become manifest or troublesome: there is little accountability or transparency, and it is difficult to exercise agency. As Eubanks (2018) observes 'we have remarkably limited access to the equations, algorithms, and models that shape our life chances'. We have ceded much of the decision-making power to automated eligibility systems and ranking algorithms which control who has access to financial support and protection (insurance, mortgages, and welfare payments), and which particularly affects people of colour and low income communities, though no-one is immune.

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. As Noble (2018) argues, the monopoly status of a relatively small number of internet search engines, along with the paid promotion of certain sites, means that students engaged in seemingly benign online searches may actually be lacking in important knowledge practices with respect to online learning and browsing: how knowledge is produced, sponsored, valued – or withheld.

The study of ignorance

Epistemology is, very simply, the study of knowledge and justified belief. *Ignorance*, by contrast, is generally taken to mean the absence or lack of knowledge or awareness, and so it seems counterintuitive to talk about the *epistemology of ignorance*. How is it intelligibly possible to bring these two seemingly antonymic states together? However, ignorance is not mere lack of knowledge, a benign gap in knowledge or some epistemic oversight that needs only to be filled or rectified. Epistemologies of ignorance is, rather, an 'examination of the complex phenomena of ignorance' (Sullivan and Tuana 2007, 1): how it is actively constructed and sustained for the purposes of domination or exploitation, or for epistemic advantage; how it is sponsored and regulated (Brandt 1998); used wittingly or unwittingly to distort, suppress or withhold knowledge (O'Neil 2016); and as a substantive epistemic practice in itself in which ignorance is wilful and socially acceptable (Alcoff 2007). Frye (1983, 118), writing of racialised ignorance, has argued that ignorance 'is not a simple lack, absence or emptiness, and it is not a passive state … [it] is a complex result of many acts and many negligences'. Ignorance is, therefore, something which is performed as a *social practice*, is often ritualised and, as we will show, it has a complex role to play in the writing and knowledge creating work of university students.

Yet, epistemic ignorance also has value. For example, it is good epistemic practice to be strategically ignorant and highly selective in the things we know or seek to know in order to remain epistemically functional, particularly now that most of us are almost exclusively immersed in information-dense digital environments. We do not, for example, need to know how many blades of grass there are in a square metre (though a gardener might) and we rarely need to know the specific set of instructions that constitutes a given algorithm. It often makes sense to grant epistemic authority and trust to those with expertise and reputation, and who are known to be epistemically responsible. We often judge what to believe on *whom* to believe, and to make these judgments we rely on criteria of plausibility, consensus, relevance, and credibility, among other things. In digital informational environments these criteria may also include online rankings, ratings, and the order of search results, such as those provided by Google. Google, the search engine that seems to be synonymous with the internet (Noble 2018), is judged by many users to be reliable and trustworthy, though we argue below that this is not always the case. The Pew Internet and American Life Project (Purcell, Brenner, and Rainie 2012) reported that 73% of search engine users say that most or all the information they find through search engines is 'accurate and trustworthy' and 66% of users regarded search engines are a 'fair and unbiased source of information' (3).

Reputation also helps when we are ignorant or uncertain. In information-dense online environments, information is useful, according to Origgi (2012), only in conjunction with reputation. It fashions collective processes of knowledge and is a 'criterion' (416) for extracting information from these online systems. Understandably, given our pervasive epistemic interdependence, and finite time, 'good epistemic conduct needs to be understood as the maintenance of appropriate balances of knowledge and ignorance, in oneself and also in relation to others' (Fricker 2016, 160). Reputation, as an 'essential epistemological notion' (Origgi 2012), may help keep that balance.

However, while it is not possible or practical to know everything, ignorance may represent a culpable failure to put effort or skill into knowing something one ought to know (Fricker 2007). Asymmetries of power in the context of the digital environment influence attributions of epistemic authority: whom we afford credibility excess or deficit based on, for example, reputation, and finite time and resources. Following Anderson's (2017) analysis, such attributions of authority can impact on general models of knowledge; the epistemic standing of knowers or producers of knowledge (the reputation or ranking of platforms such as Google); whose claims various epistemic communities, such as students, will accept, and ought to accept as credible; and how this affects the distribution of knowledge and ignorance in society by algorithms, or other sources of information, such as a journal, newspaper or a course lecturer.

Given recent revelations about Facebook, we should know by now that our data can be mined and used without our knowledge, and therefore consent. Epistemic practices may lack know-how (skills) and propositional knowledge (know-what), and, of course, motivation. Many undergraduate students are often passive consumers of what they are taught or told, or have read. They grant, reasonably, epistemic credibility to their lecturers, as we will discuss below. Like many of us, they are also often passive consumers of online information and search results, again, as we will discuss below.

Online searches are conducted through a series of steps, algorithmically mediated, which are implemented by programme code (Noble 2018, 37). Regarded as neutral

because they are algorithmic and scientific, these mathematical formulations are evaluated through procedural and mechanistic practices which include tracing hyperlinks among pages. This is defined as 'voting' which describes search results that move up or down in a ranked list of websites (Noble 2018, 37). Most are automated or happen through graphical user interfaces that allow people who are not programmers to engage in sharing links to and from websites (37).

Noble (2018), among others (e.g. O'Neil 2016; Eubanks 2018), has pointed out that, contrary to the belief that online platforms like Google are objective and neutral, or even infallible, discrimination is embedded within their very computer code and artificial intelligence systems, and that these can mask and deepen inequality, as well as render the user less agential than she thought. The mathematical formulations that drive automated decisions are not 'benign, neutral or objective' (Noble 2018, 1). The designers themselves have values which may promote prejudice as Noble (2018) documents with respect to persistent and widespread racial profiling, sexism and misogyny online.

Worryingly, institutions like schools, universities, and libraries are increasingly being displaced by, or are reliant on, web-based tools such as Google (Noble 2018) because users think of them as public resources that are free from commercial interest and bias – which they are not. Google is an advertising company, and search results produced through it reflect the values and norms of the company's commercial partners and advertisers. Consequently, search results play a powerful role in granting or reinforcing beliefs in the epistemic authority of, as we argued above, general models of knowledge; the epistemic standing of knowers, whose claims various epistemic communities accept (or not) as credible, and how this affects the distribution of knowledge and ignorance in society (Anderson 2017).

Why should this be a matter of concern? One reason is that algorithms are creating 'new asymmetries of power', and are perceived as being better knowers of ourselves than we are (Origgi and Ciranna 2017, 303). Data mining, is a useful example. The interpretation and processing of data, makes a number of correlations through which the interests of the users are individuated to anticipate future actions. These predictive profiles are the essential ingredient of online marketing strategies – and of which users may have no knowledge. At the time of writing, we have learned that our identities are virtual objects that companies can buy and sell without our knowing, or without our voices being heard or taken into account (Buttarelli 2018). The ways in which we search for, use and communicate information through the web, and the roles and effects of search engines, has been, and remains, largely unknown to most users. We are largely ignorant of the effects and uses of our cognitive outsourcing and online monitoring, on our status as competent informants, or that we have online avatars (Origgi and Ciranna 2017, 305). Since algorithmic procedures are determined by the owners of the platforms according to their interests, a profile of a user can be created using personalisation algorithms, by collecting and storing tracks based on browsing history, IP addresses, social network activity, email content, and key words in search engines (307). These avatars are potentially partial, and may not present what the person wants to be known about herself or represent who she fully is (Origgi and Ciranna 2017). Not only may users be ignorant of what is happening, but they may also not know what their rights are or the uses to which this passive mining of data is being used. As we are increasingly

coming to understand, such ignorance is not a benign gap in knowledge. We should question how corporate 'sponsors' (Brandt 1998) of digital literacy, companies who dominate the internet such as Google and Facebook, are benefitting (economically and in other ways) through users' ignorance of their platforms.

We have an hermeneutical gap about predictive online profiling and attributions of rights and duties which are not yet the subject of full debate since a significant number of users may not know, and therefore cannot name, the potential and actual harm being done to them. We currently lack hermeneutical resources to talk about these issues and develop awareness of our rights of our profile which are, at present, wholly in the hands of the platform, and this is the case even when users, such as students, are engaged in seemingly benign searches for information to write an essay.

Students who are novices within a particular knowledge-based community or academic discipline will understandably rely on the directions and guidance of other actors, such as lecturers, leading to an inevitable asymmetry of power. Academics often warn their students about the quality and veracity of information they obtain from the internet. Students are often told to undertake rigorous searches in subject-specific repositories and rely on refereed literature, rather than trust more accessible treatments of a topic available in Wikipedia or in alluring YouTube videos, both of which will likely appear at the top of students' search results.

Despite the warnings, as we will see from the accounts below, students in varying ways trust and use a variety of strategies to manage the wealth of information they find online. How they come to trust and select those strategies, and how they manage information, can tell us much about their knowings, and how those epistemologies manifest in their practices of digital literacy. Yet how university students actually go about writing their assignments, how they seek out and discern information as part of their study practices has remained remarkably under-explored. As we have all increasingly come to realise, and have argued above, the internet is not the infallible and neutral repository of information we recently believed it to be; so how do students learn whom or what to trust to help them navigate through the epistemic gaps in their curricular work? This is one of the key areas of investigation in a current study of digital literacy in Higher Education, as we will now discuss.

A research project on digital literacy in higher education

Methods

The research was situated across disciplinary sites (STEM, Computer Sciences, Arts and Humanities, and Business subjects) in two universities in Northern Ireland. The research aims to develop a critical understanding of university digital literacy *policy* versus *actuality* and for the purposes of this paper, four students' case studies (from a total of ten) were selected for analysis and discussion. Students were recruited through lecturers known to the primary researcher, and student networks online, and selected to represent each of the faculties and disciplinary groups across both universities, and, as far as possible, gender, ethnicity and diversity of disciplinary subjects.

To capture the diversity and richness of digital literacy and writing practices of the students, a combination of the following methods was used:

(i) Focussed interviews were conducted with each student participant. Initial interviews were a pre-assignment 'walk-around' interview of the student's campus to examine how study habits are mediated by their material environment, particular campus technologies and official learning spaces.

(ii) After the initial interview, each participant conducted a screen recording of a course assignment task. Through this method we were able to record the iterative processes of writing and online practices (searching, composing and revising). This data collection technique is substantiated in other research into digital literacy and writing (see Bhatt 2017b).

(iii) This was followed by a post-assignment discussion of the writing task and the students' history of use with digital media over the course of their life. This follow up interview allowed us to ask the students to reflect on the assignment task they had just done, and also to examine how their confidence and practice with digital media and online behaviour evolved over time. The students were asked about how they sought information online; how they assessed the veracity and authenticity of search engine results; and how they judged the trustworthiness of the information.

(iv) Additionally, software which captures quantitative patterns of digital behaviour (e.g. time spent on tasks and sub-tasks like web searching) was also obtained from the participants during their assignment writing.

From these data we were then able to capture a detailed impression of the digital literacy practices of the students, both during a specific session of assignment writing and in their academic and social practice more generally.

Ethical challenges

Ethical issues relating to this research were fully examined and approved through the institutional ethical review process. Specific challenges emerged which relate to the use of digital data obtained from participant's machines, namely points (ii) and (iv) above. Therefore, during the screen recording, participants were given the option to 'pause' the recording whenever they wished. Screenshots with identifiable information were also edited to protect participant identity, and no identifiable information was captured in the data logs of computer use. All software was uninstalled from a student's machine immediately after a writing session was completed.

Preliminary findings

For the purposes of this paper, we will focus specifically on those features of the cases examined thus far that relate to how the students searched for information online while writing their assignment tasks, and how they discerned the quality of that information in their writing. Since ignorance, as argued above, can manifest in ritualised practices, in this section we will show how it emerges through practices of digital literacy and the complex role it plays in the writing and knowledge creating work of students. We will also explore the extent to which students were reliant on their lecturers' judgements

and decisions about what is acceptable and credible for their work. The student cases examined in this paper come from: 'Kim' (Cinematic Arts), 'Rahat' (Economics), 'Nusrat' (Medicine), and 'Phil' (Politics & Philosophy).

Kim (Cinematic Arts)

Kim is a first year student of Cinematic Arts. The assignments she receives for her course are varied and include such genres as script writing, visual story-telling, coding, and short essays.

When writing her assignments, Kim very rarely goes beyond the resources uploaded by her lecturer in the Virtual Learning Environment (VLE). We can view this practice of the lecturer as a form of 'curation' (Bhatt 2017a), which is 'when certain actors guide the assignment writing along a certain path and place boundaries around the task to regulate its outcome' (144). These curated resources are the basis of the course content in the form of slides from lectures, pdf files and links to online readings. This curation is important for Kim, as it helps standardise, and in some ways ritualise, the writing practices necessary for assignment completion.

Throughout the interviews, and substantiated in the screen-recording of her assignment, Kim emphasised how reliant she was on the curation work of the lecturer, arguing that 'If a teacher sends a reading to us, I'll trust it. I don't know why, but you just do'. She would even email the lecturer to request resources when she was not satisfied with what she was given. This is because, as she states, 'If I am the one who found it myself, I would be sceptical about it'. Kim lacks epistemic trust and confidence in her own skills and knowledge, and so accords epistemic credibility to her lecturer.

But in the rare instance where she felt the need to go outside the framework of her lecturer's carefully curated resources, she attaches value to the results only if the searched item (a key word, concept, story, for example) appears at the top of search engine results. In terms of any epistemic judgements she makes, the greater the congruity between websites in what they report and rank, the more likely she is to accept that information and incorporate it into her assignment.

A kind of discernment did, however, emerge in her pre-assignment group task. The assignment that was screen recorded was on the subject of visual storytelling. A pre-assignment task involved a group discussion online where Kim was able to garner information from a group of fellow students about the topic. Much of the recording is spent with Kim writing and flicking back and forth from ideas she had collected in the group chat prior to the actual writing of the assignment (see Figure 1). This was a recording of an online group chat by which she could access a record of the group's collective ideas. She had curated this information from the group members, her epistemic community, and was able to draw from it as she wrote the assignment rather than search for content online.

Kim values this kind of pre-assignment group interaction over and above information that she finds online. Her scepticism about seeking information online and her trust of the people around her, to whom she attributes epistemic authority, is well encapsulated in this quote from an interview: 'There's a lot that you read on the internet that's not what you actually hear from other people outside of your computer'.
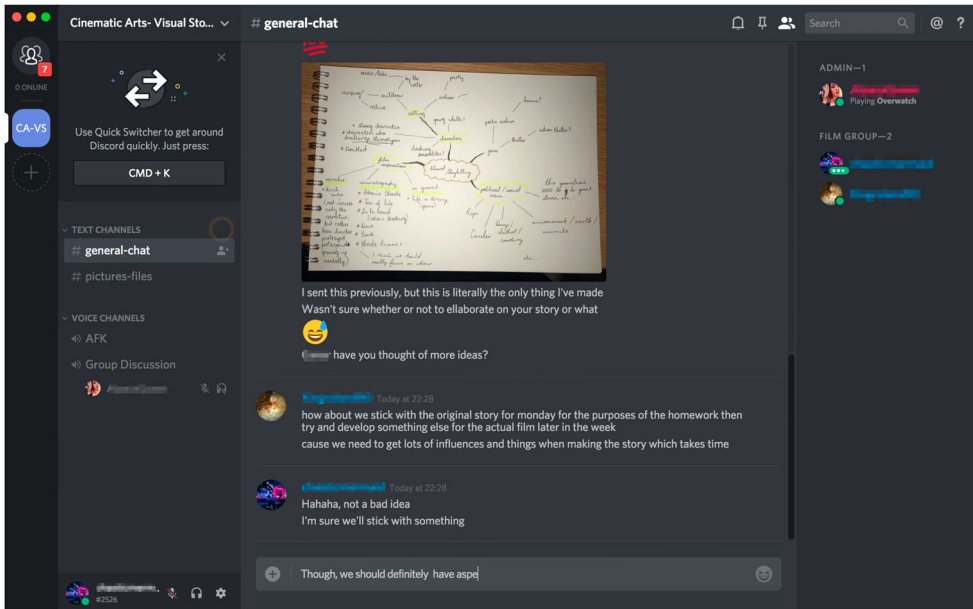
Figure 1. Kim spends most of her time flicking back and forth from ideas she collects in the pre-assignment group chat.

Rahat (Economics)

The research was carried out in the early stages of Rahat's degree in Economics, when his assignments usually consisted of short pieces on topics with a 1–2 weeks' deadline. For example, at the time of screen-recording, he had completed a 600-word assignment on *The Great Depression* for which, as he told us in a pre-assignment interview, 'All the resources that we needed were on one website that I used. I didn't do much reading … it was all online'.

In this respect, Rahat's approach to writing for assignments does not differ considerably from Kim's. The lecturer gives him links to websites for each individual assignment, and sometimes this will be a single link with all the important readings on it. His lecturer would usually explain the readings in class and then double up by sending them via email to the students to make sure: 'It's all in the email'. Rahat also explained that he would rely on it a lot, arguing that 'it's the best guidance because the lecturer has read through it'. Understandably, and unsurprisingly, Rahat places epistemic trust in his lecturer to guide him to the best reading. Rahat also applied the same level of trust to his lecturer's tweets, considering them to be on a par with thought leaders and public commentators in the field of Economics. He benefitted from his lecturers' social media updates, and therefore reputation, because they provided a broader view of the subject than the lectures.

When asked if students should be wholly reliant on the information provided by their lecturers he said, 'No, because I think that would be too much spoon feeding. I think that students need to do their own searches as well'. However, on this occasion, this was not borne out in Rahat's actual practice.

If further and more extensive reading is required for an assignment, Rahat will search via his preferred search engine, Google, by typing in the title of the assignment task and clicking on the results that immediately relate to this. This he explained as follows: 'I would type in the main title of what the essay is about, and scroll down, and whatever I think that I can relate to and understand easily, I would go with that'. On the surface, Rahat uses few complex thought process and concepts in the search since he uses his essay title, and readily accepts results that closely match it.

Rahat was unable to describe other filtering processes. What seemed to matter was that the filtering of search results was related to the extent to which the information he received was relevant to his assignment rather than its academic credibility. As with Kim, he also favoured top search results and judged the credibility of these based on their popularity, and, hence, assumed reputation.

Nusrat (Medicine)

Nusrat is a second-year student of Medicine. The assignments he has to complete for his course are varied in nature, and include write-ups of scientific practicals and short essays which require prior reading and research. When he has to write an essay, he steadfastly limits himself to academic sources only. He told us that:

> I wouldn't be using Wikipedia. I'd be looking at papers from PubMed. Often I'll just type in the subject matter on Google and it will give me links to different websites, which I know have academic papers on. So things like PubMed, things like Cell, things like ScienceDirect, those renowned websites.

He is fairly confident when it comes to independent study practices, including his ability to search for, and select information for his course. He explained that:

> I know what I'm searching for. Even if the lecture might not be that detailed, I would still use that lecture as a guide of what I need to know. For instance, I was learning about female reproductive physiology and the PowerPoint for that wasn't that detailed. But I found the relevant chapter in a physiology textbook and I was able to fill in the missing pieces and make sense of it.

Here, Nusrat emphasises his confidence in making sense of information that he feels is lacking in his lecturer's course content. He also sees this as part of the practice of learning on his course: 'The assignments we usually get will be stuff that they've touched upon in a lecture, but maybe the purpose of the assignment is to make us go into it further'.

His strategy is to target academic databases for information, like PubMed, a database of academic reports on life sciences and biomedical topics, for sources that may be lacking in his lecture notes. Most of Nusrat's web searching is channelled through these databases and they are his primary source of information. His assignments will predictably relate directly or indirectly to this content. Another reason that explains his need to foster practices of independent searching is given as follows: 'In all honesty, sometimes PowerPoints are not that good', in which case he describes himself as 'able to adapt and find another way'.

We see examples of this during the screen recording of his assignment which was on the portrayal of mental illness in film (see Figure 2). As he began the task, Nusrat accessed the recommended readings from his lecturer's notes. He then searched online for 'movies and

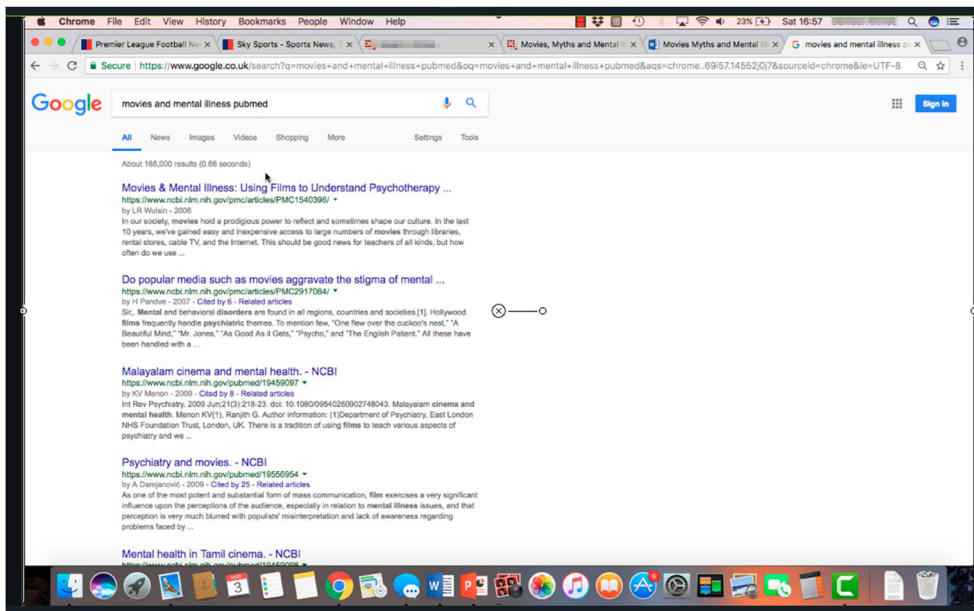**Figure 2.** Nusrat tries to target solely academic databases for information through Google searching.

mental illness pubmed' highlighting the desire to direct his results towards 'pubmed'. The recording reveals that he did not read any report deeply at this point, but merely skimmed to see which films had been analysed for their portrayal of mental health issues. It is only after viewing multiple results of films such as 'Beautiful Mind', 'Logan', and 'The Hours' in academic articles that Nusrat decided to target these films for analysis in his own assignment. In a post assignment interview he clarifies his methods as follows:

> It's always hard finding that initial paper but once you do, that leads onto finding other papers. It's like once you find that one paper, then it just becomes a lot easier from then on.

The question here is about trusting what has been analysed before in previous research. Nusrat outlines his trust in selected online materials as follows: 'if you go onto a website and the article looks poorly produced, or informally written, or only one author has written it, that would make me turn away from it'.

Phil (Politics & Philosophy)

Due to the nature of his course, Politics & Philosophy, Phil, a first year student, recently joined Twitter in order to keep up to date with news and current events, as they inform his ongoing written work. Having used Twitter in the past, he stopped using it because of the amount of time it was taking up. He then began re-using it more strategically to keep up to date with political events and news for his course. After experiencing an overwhelming amount of variety of news through Twitter, Phil decided to subscribe to Guardian Online for the news relevant to his course. In this way, he felt able to manage the multiple sources of news he receives by relying on Guardian Online for, as he assesses it, journalistic quality, integrity and news that is consistent with his political inclinations.

This management of his news information sources is essential for two reasons: it is information which will contribute to his development on his Politics & Philosophy course, and Phil currently has little interest in consuming information which is in direct conflict with his political views. Phil's practices mean that he is engaged in a form of strategic ignorance: to be epistemically functional, there are things or views of the world that he does not want to, or cannot know. However, though Phil's decision was strategic, relying only on one source of news information is not, perhaps, best practice. By deciding to channel all his news through Guardian Online, however reputable, he ritualises his practices and ensures non-exposure to views different to his own.

Discussion

Kim, Nusrat, Rahat, and Phil all offer interesting insights into the varied practices of digital literacy emerging in undergraduate work. They differed substantially in the way that they searched for, managed and discerned information for curricular work. Both their similarities and dissimilarities call for explanation. What do these practices of student digital literacy imply for our understanding of ignorance discussed earlier in the paper?

Kim and Rahat typically follow the detailed guidance specified by their lecturers and both are careful to produce work which only draws from the resources provided as part of course materials. When each of them felt the need to search for information beyond what was provided, Kim and Rahat tended to rely on search results that appeared in multiple locations as a criterion of authority. Nusrat, in contrast, casts a much smaller net in his searches for information. His self-reports and assignment recording revealed a much more focussed practice of information searching, and a certain amount of confidence in his ability to use other sources to 'fill in the missing pieces' from lecture notes. Nusrat attempts to understand the curricular task he is set. Clearly, most of what he produced in the course of writing his assignment was through this kind of self-discovery, with information filtered through his own assessment of its importance and credibility. For Kim and Rahat, the lecturers seemed to be the ultimate epistemic authority.

These and numerous similar observations led us to the conclusion that all the students' writing and information seeking practices were *ritualised* – that is, motivated mainly by a need to adhere to the rules of the game. Building on the notion of curation described earlier, ritualised practices of assignment writing are about defining the sequence of events for task completion in such a way that the expectations (for students and lecturers) are clear and relatively habituated. Ritualised practices can be sustained through the common experience of the instructional practices of schooling prior to graduate study, and an examination of them can tell us much about how epistemic trust is accorded in online practice.

Ritualisation directs teaching and, rather than encouraging students to cultivate skills of discernment and trust in their own judgement, has the potential to restrict research practices on account of high levels of epistemic trust in certain actors, be they lecturers, search engines, or news websites. This can constrain and restrict students' practices of information gathering, and thereby sustain ignorance of alternatives. But can and should we expect anything more from undergraduate students? Would doing otherwise result in cognitive overload? Ritualisation can be an essential part of inducting a student into the forms of knowledge creation necessary within a given discipline. It is itself a form of non-culpable strategic ignorance, and can help situate a student's literacy practices as a novice

within their discipline. But such habits could, conversely, create a tendency to be unreflective and habituated in research practices, and leave students over-reliant on, and passive users of, the decisions of popular search engines, with all the dangers that entails, as we discussed earlier.

All four students felt obliged to complete their assignments through ritualised practices of digital literacy. Their assignment writing is an activity whose significance rests in its manner of performance, as much as in its end product. For example, Nusrat relied on criteria of journal ranking, number of authors, and quality of presentation to make judgements of plausibility, relevance, and credibility. Kim and Rahat viewed multiple citations of information as something which renders the results epistemically trustworthy. The idea that multiple sources which say the same thing equates to corroboration and validation is an idea which has its origins within the academy, but cannot be assumed of online searches for the reasons we recount above.

Some kinds of ignorance or knowledge practices are not mere oversights. We have limited time and resources and it is rational to grant credibility to epistemic authorities, as these students clearly demonstrated, and to trust on the basis of reputation, expertise, and so on: epistemic dependence is necessary and unavoidable. Phil, for example, knowingly channelled his news through the Guardian Online website, entering into a particular set of debates which delineate his belief formations in order to manage his finite time and resources. Yet, while Phil's decision is strategic, even necessary, it entails a particular kind of epistemic dependence on a particular set of views – perhaps we could even think of this as invested, if strategic, ignorance of alternative world views.

The literate activity of students in digital environments is supported and shaped by powerful historical, social, and economic forces, or 'sponsors' of digital literacy who, through their digital platforms and technologies, offer users both opportunities and the potential to constrain and suppress. How students, therefore, make use of these opportunities, and how they come to make sense of the constraints and work through them (or not) is a challenge facing educators. As technology is an integral component of learning, students must be supported in developing a critical awareness of how power operates in online spaces, and how ways of thinking and being are culturally produced and re-produced, and sponsored. If students are restricted in what they can know because they are unaware of how exogenous actors (e.g. algorithms) actually work, and how they guide their choices and shape their experiences online, then it becomes important to educate them to be critically aware during their digital searches for information, research and critical argument, and to educate them to be reflective about their ritualised practices with digital literacy. The challenge for Higher Education is to understand how particular forms of digital literacy practices pave the way for the construction of ignorance, and to develop mechanisms that counter it. To do this requires critically examining student digital literacies in light of epistemologies of ignorance.

Acknowledgements

Disclosure statement

Funding

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