



*Society for Research
into Higher Education*

***How connected are students to
campus technologies and official
learning spaces?***

***A study of digital literacy and writing in
Higher Education***

Research report

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1 Executive Summary

This SRHE funded research closely examines the nature of students' digital literacy and writing practices in University undergraduate courses. The study focuses on ten students' assignment writing practices for comparison within different disciplinary sites (STEM subjects, Arts & Humanities, and Business programmes), across two universities in Northern Ireland: University A (a Russell Group, research-intensive university) and University B (a former college and teaching-centred university).

Using assignment-writing tasks across two contrasting universities as 'telling cases', it is a detailed study of digital literacy, writing practices and knowledge creation in the everyday lives of students. It investigates the diversity and complexity of how curricular tasks are completed across different disciplines and institutional cultures, and aims to fill a key gap in the HE knowledge base on student digital literacy and, in its methods, pioneers advancements in data collection.

Previous research on academic literacies has tended to focus on the experiences of learners over explorations of texts being written. This research, on the contrary, focuses on the knowledge producing practices of learners in HE and how these emerge through new forms of digital writing and information management.

Key Findings

- Participants accord trust to different actors in their practices of knowledge creation. These include university lecturers, well-known and high-ranked journals and certain media outlets such as the BBC. Examining how this trust comes about is a theme that has been examined in detail in the first series of publications emerging from the research.

- As most participants were born in the late 1990s, there is no marked transition from outdated modes of communication e.g. house phones as they have always used a mobile phone to contact friends. Practices of digital literacy which become ritualised, including aspects of 'trust' as outlined above, carry forward into higher education and have their origins through the common experience of the instructional practices of schooling prior to graduate study.
- There is a marked overlap in personal and academic use of digital media and platforms e.g. participants would use Facebook Group Chat to chat with friends and family; and to communicate with classmates in university group projects. These outside-of-institution spaces serve as great generators of student knowledge creation.

2 Introduction

2.1 Research background

This research is located within the literatures on digital literacies in HE, learning in the digital university, and student writing across the disciplines. It extends the parameters of the award holder's own work (Bhatt 2017a), a recent volume on 'Literacy in the Digital University' (Lea and Goodfellow 2013), and work on students' academic literacies (e.g. Lillis *et al.* 2015). It therefore aligns well with themes and debates currently taking place in the sector, including on the role of digital literacy policies in HE.

Through a 'Literacy Studies' framing (see next section) the research examines how digital literacy and academic writing occur in the lives of students in the contemporary university. Using assignment-writing tasks across two contrasting universities as 'telling cases', it is a detailed study of digital literacy, writing practices and knowledge creation in the everyday lives of students. It is a starting point for further examining the changes resulting from digitisation (from both within and beyond the university) and how connected students actually are to their officially designated learning spaces.

Notably, close examination of writing practices and digital literacy, and how they are managed and experienced in curricular tasks, throws light on issues of broader significance in HE, including:

- i) *How the nature of academic work is changing;*
- ii) *The opportunities and challenges brought by technological change; and*
- iii) *The impact of digitisation on the 'student experience'.*

Through this research these have been examined across different different disciplinary sites (STEM subjects, Arts & Humanities, and Business programmes) each within two universities that are subject to very different organisational and managerial cultures and priorities.

By adopting the latest data gathering techniques to empirically capture the diversity and richness of digital literacy practices, this project also builds upon previous work which argues for an evolution in research methods (Bhatt et al. 2015). It adds to this by analytically mapping *when*, *where*, and *how* digital literacy practices occur. This was contrasted with institutional expectations of digital media use and students' reported experiences with institutional technology, to ultimately develop a critical understanding of University digital learning *policy versus actuality*.

Study findings therefore enrich the debate on how to develop valid and research-based evidence on student experience, and how disciplinary influences can shape digital literacy digital learning policies in universities. Through examining how deeply students embrace, or avoid, their institution's technologies, this study is a useful way to evaluate the impact and efficacy of both universities' evolving digital learning agendas (represented in the research as 'University A' and 'University B'). Since both institutions are keenly developing digital learning strategies, this research a useful starting point to examine how connected students are to their campus technologies and official learning spaces. It therefore draws from, and contributes to, current themes and strategic priorities in both institutions, and intends to be a model for future cross-institutional studies.

2.2 Literacy Studies

This research, as highlighted above, adopts an approach which examines students' literacy practices as conceptually associated with, and realised through, 'social practices'. As a result of this conceptual view of literacies as primarily social, this research takes learners' *context* as a starting point, and main focus of enquiry.

Arising from this perspective is a distinction between 'literacy events' and 'literacy practices' (Barton and Hamilton 2000). 'Events' refer to observable and empirical moments which are integral to literacy activities. The configuration of 'practices' are what make up the sociocultural construct of a typical literacy event. What becomes central, then, in the exploration and analysis of literacy events is the 'configuration of action, talk and text' (Prinsloo and Baynham 2008: : p. 8) and the network of actors (social, material, political, etc.) played out through the ensuing practices.

Following this, learners' digital literacy practices which, when taken together to formulate a finished piece of work, such as an assignment, can encompass a myriad of social practices. These include the processing of multiple textual sources, navigating links, evaluating content suitability, and mobilising actors (friends, teachers, texts, algorithms, etc.) for aid in the work of knowledge creation. These practices which go into meaning-making are often beyond the sight of teachers and researchers, and emerge through a variety of static and portable devices being used, highlighting the need for wider methodological approaches to explore precisely how digital literacies saturate the new and developing learning ecologies.

2.3 Project aims and overview

The study, thus, sought to explore how disciplinary knowledge is produced through the digital writing practices of undergraduate students. The main research question is therefore:

1. How is disciplinary knowledge produced through the writing practices of undergraduate students?

Using this main research question as guide, the following subsidiary research questions were posed:

2. How do students' social/personal practices with digital media become mobilised into their course assignments?

3. What are the space-time configurations of these practices?

4. Are there discrepancies between the ways in which students carry out assignments, and the policies and expectations of their course, and disciplinary culture?

5. What are the implications for HE teaching quality, institutional digitisation strategies, and the pedagogic function of assignments in different HE disciplines?

In addressing each of the above questions, the research aims to relate students' writing practices to the broader contexts of change within HE (e.g. massification, digitisation, and large investments in official learning spaces). These questions allow for an examination of the diversity and complexity of how curricular tasks are

completed across different disciplines and institutional cultures, and will therefore yield an original contribution to the study of digital literacy and writing in HE.

2.4 Research methods

The data collection procedure for this project was successfully piloted at the host institution through a small 'Faculty Research Initiative Fund'. This was a smaller-scaled version of the exact same procedure, outlined below. The study adopted a multi-phased qualitative methodology which included a vieographic component. Participants were recruited from both University A University and University B using existing contacts as well as those established through activities with the SRHE Digital University Network.

The following multi-phased data collection procedure was carried out, using both the Primary Investigator and project Research Assistant:

1) Phase one – Interview 1

The first phase was a 'walk-along' interview with the student participant. to examine writing habits mediated by campus environment (writing spaces, libraries, cafes, etc.). This is an interview technique which incorporates a walking tour of the learner's campus and work environment. Adapted from Tusting et al. (2019), this form of data collection helped us to understand the roles that material space, campus resources, and working environment have on knowledge creation and writing practices. This phase of data collection was accompanied by photographs of students' working environments (see Appendix 1), written fieldnote observations and collections of any relevant documentation related to writing, such as policies on digitisation.

The University B campus library, for example, has various zones where students can work. Figures 1 and 8 show desks in an open plan area of the library where students can work together informally with screen access. Figure 2 shows a group study room that is booked online. Figures 3, 5 and 6 depict open plan areas of the library where students can work alongside books in a whisper zone. In Figure 4, the photograph portrays an eating area where students can also work. Figure 7 is a picture of a table and chairs where students can sit and chat, and work if they wish but it is not a designated study space due to unsuitability of the chair and table heights. Finally, figures 9 and 10 show a closed learning space which are for students only with no staff access.

2) **Phase two – Videography**

The next phase was a screen-recording, using the Camtasia software. This was installed and activated on students' laptops to provide a 'screen-in-screen' recording of the assignment task which will be rendered into logs to tell a qualitative 'story' of the writing task that student had to complete. This enabled us to capture the moment-by-moment practices that were drawn on in daily acts of writing work and to identify which actors were mobilised, and how, for writing to happen. See Appendix 2 for screenshots from this phase of data collection. These data were then rendered into easily readable 'video logs' of the recordings. In line with the methods employed by (Bhatt 2017b) see Appendix 3 for examples of this stage of the data analysis.

3) **Phase three – Interview 2**

The third phase, and second interview, was a 'technobiography' to examine student's history of use, experiences, and confidence with digital media. Building on early work in cybercultural studies (Henwood et al. 2001), which draw attention to

technobiographies, this method solicits the learners' "everyday relationships with technology" (p. 11). This interview procedure also allowed the researchers to discuss the screen recording of the assignment and to highlight further points of inquiry from it.

4) **Ongoing – Activity-tracking software**

Using an app called RescueTime, this ongoing data collection tool was designed to provide a detailed breakdown of the assignment task completion through quantitative analytics. These allowed us to evidence detailed individual patterns of digital behaviour and breakdown of writing practices (e.g. average time spent on tasks and sub-tasks like web searching) as the students carried out their assignments. Examples of these patterns of data are to be found in Appendix 4.

2.5 Data Sample

The interviewees invited to participate in this study were approached by through the convenors of undergraduate modules for STEM subjects, Arts & Humanities and Business programmes at both University A and University B. Once convenor names and email addresses had been collected, emails were sent explaining the project and requesting that the convenor send out a recruitment email (template written by the PI and RA) to students. Also, management staff such as course administrators were targeted and asked to send out the same recruitment emails. University staff had to be contacted several times as there was a low response rate (during the summer months this was a regular occurrence as staff were on annual leave); plus, they were asked to resend the recruitment emails as students were also slow to avail of the opportunity to partake in the study.

Once students had confirmed their willingness to participate in the study by emailing the PI or RA, arrangements were made to meet for the first interview, where the project, confidentiality, informed consent and what would be expected of the participant were explained further. The participant was given an information sheet and consent forms were signed (one for the PI/RA and one for the participant to keep).

2.6 Ethical considerations

Ethical issues relating to this research were fully examined and approved in the ethical application process for the study. Specific challenges that emerged relate to the use of new forms of digital data obtained from participant's machines. Examples of how these challenges were overcome included taking such measures as:

- During screen recording, allowing the participants to 'pause' the recording if they would like to
- To 'blur' faces in screenshots for publication;
- During the app-tracking phase, to ensure that no identifiable information is captured; for example, all that will be visible in an output will be that "student X spent X amount of time on email during their assignment task completion, and X hours on Facebook, etc." - without the email or Facebook itself actually visible. And to highlight the option to 'untrack' certain apps, and at certain times (e.g. between certain time frames), and certain browsers;
- To uninstall both softwares immediately after the writing session is completed and transfer the data file onto my own personal external hard-drive.

3 Key findings

The following sections present distilled and summarised findings from the project. Compiled for the purposes of the report, these are not meant to be exhaustive findings, but they are summarised from a number of sources outlined above in the previous sections, including interview transcripts, fieldnotes, and videologs.

3.1.1 Participant 1, Nusrat (University A, 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”.

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”. Nusrat emphasised 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.

From the screen recording it was evident that 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 predictably relate directly or indirectly to this content. 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.”

He does most of his work at home and does not use the library for study. Furthermore, from the screen recording it was noted that he did not use the library website to search for articles or books, and he reiterated this in the interviews.

3.1.2 Participant, 2 Laura (University A, Business)

Laura prefers to gather information online and does not use her university library or the public library for any material sources. She only uses the university campus library for working on assignments and prefers to use the main campus library building and the third floor where there are fewer people.

She spoke about how University A does not subscribe to Mintel which is a major resource for business students. She was informed by her university library that she can access it via the public library. In order to access this resource remotely WJ uses it via her friend who is studying at an English university. Another example about University A's lack of business resources is that one of her lecturers is able to source marketing reports due to their previous employment at an English university.

She uses a myriad of online sources to search for material for assignments e.g. Wikipedia for ‘basic information’, University A Library online search, Google Scholar, Google and academic journal articles. She will follow the bibliography of articles to find out where information has originated. She takes lecture notes but does not go back to them as she likes to follow her own interests. A lecturer's influence changed her method of collecting sources for her degree and in her recording, she gathered articles and input them into a structured table with quotes and then the citations.

In order to verify sources Laura will make sure that the same thing has been said in several different places. BBC news is her only source of news and she takes what is written by the BBC at face value. She does not challenge news as she believes that the BBC is credible. Plus, she has a mentality that “if it is not on Facebook then it doesn’t exist”.

As Laura is in her late teens/early twenties there has been no transition from keeping contacts’ details in an address book to using her phone. It was expected that as the internet was available whilst she was growing up, she would have availed of online searches for information. However, Laura and her family are Polish and immigrated to Northern Ireland when she was a child. Therefore, she remembers using books a lot for information and for learning English (she sounds like a Native Northern Irish person). She only started using the internet in school for assignments.

3.1.3 Participant 3, Phil (University A, Politics & Philosophy)

Phil is a first year student of Politics, Philosophy and Economics who has lived in the local area all his life. He does not own a laptop and only recently acquired a smart phone. He has a carefree and nonchalant attitude to digital technology and only uses and purchases devices which he feels he needs to.

He ends up using the university library laptop loan service and does most of his writing and reading within the library building, often inside the various group study rooms. Most of his campus time is spent here and nowhere else around the campus, except for the teaching sessions and lectures which are always nearby.

Phil’s management of his news and 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.

3.1.4 Participant 4, Tiffany (University A, Software Engineering)

Tiffany is a first year student of Software Engineering who has lived in the local area all her life. She owns a laptop and an Android smart phone. She spends most of her time in the Computer Science building, and this is where all resources for her work and writing are immediately available. The computer cluster also has senior students to hand as support staff. Tiffany never visits University A library.

All her writing is done on either a PC in the cluster or on her laptop (preferring the latter) and this is because assignments are mostly a mixture of coding, and related documentation (e.g. a Test Plan) and screen recordings of testing. This requires multiple windows to be open simultaneously on her laptop during writing.

Her interest in this field was stimulated during a High School evening club on coding, although Computer Science or Software were not an original choice for her A-Levels. She ended up excelling in the club and enrolling for the A-Level.

3.1.5 Participant 5, Rahat (University A, Economics)

Rahat is a first year student of Economics. He enjoys the mathematical elements of his course the most, and spends most of his campus related time in the Medical School's library because it is close to his house. He is very reliant on the lecturers' input and suggested resources, and does not deviate from the readings lists and other resources offered to him by the Lecturer. He sees it as fundamental to the role to be given clear and delineated guidance in this way.

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.

Rahat was unable to describe complex filtering processes when searching for information online. 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, below, he also favoured top search results and judged the credibility of these based on their popularity, and, hence, assumed reputation.

3.1.6 Participant 6, Kim (University B, Cinematic Arts)

Kim is a first year student of Cinematic Arts. She enjoys the wooded surroundings of the University B's campus. She says that it helps her do her writing. This and her own room at home, which is also on campus. She enjoys her course very much and feels that she can do "anything she likes" on it. She is very reliant on the VLE for course related resources and director in what to read for her assignments, and these are pre-curated resources from her Lecturer. She very rarely feels the need to go outside of this for information and resources. But when she does, she will cross-reference the veracity and credibility of information she encounters online through checking if other websites hold the same information the she has encountered. She isn't sure which websites she would go to to cross-reference but just that it appears in further searches would be enough for her.

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. 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.

3.1.7 Participant 7, Donna (University B, Marketing)

Donna is very friendly and accommodating. She is 21 years old and in second year. She works in a marketing business outside of university. She explained that she wants a first class degree and has paid a lot of money to be at University B, thus she asks a lot of questions from lecturers and tutors to make sure that she 'gets her money's worth' and gets the best grades possible. She uses all the available sources on the VLE the online portal where staff put up resources for students; if there is something that she can't find or doesn't understand, she will directly ask the lecturer.

She likes to work in a part of the library near the entrance where she can work and talk in a low voice (plus drink hot drinks). She likes to work upstairs in the library as well where it is an informal working area and it's close to a small café called the 'Scullery'. Moreover, there is an area in another building where no staff are allowed. She likes to work in there as the chairs are comfortable.

3.1.8 Participant 8, Craig (University B, Marketing)

Craig prefers quiet spaces to study and finds that the computer labs can get too loud, and if needs be he can ask a librarian to shush people. He uses the break out space in the library (akin to a canteen) to eat lunch and meet with friends.

Group work makes up a lot of his assignments and he makes use of bookable classrooms for this, or else meets people in the canteen in a building of University B which he and his friend's call the 'Hogwarts' building. He hates it when people do not pull their weight in group assignments and this is why he tends to avoid group work when he can.

Craig is married (wife) and has two young children, he works from home and says that we couldn't do the interview there (jokingly) as it would just be screaming kids in the background. He lives nearby and can walk home from campus.

He used to be a welder which was good money, but he wanted more out of life thus came to University B as a mature student to study Business Studies and Human Resources.

3.1.9 Participant 9, Arthur (University B, Biomedical Sciences)

When writing assignments, Arthur prefers to work from his room on campus as there is less noise and fewer distractions. Plus, he does not have to pack up his stuff and bring it with him when he needs to leave his desk for a drink etc. Thus, Arthur values solitude and quiet when he is writing.

With regards to digital sources, University B's online portal is the major resource for Arthur. This is where lecturers put up course notes and recommended reading. The library is useful for ebooks etc and Arthur prefers digital resources. He uses his lecturers' notes but likes to follow his own leads to get more detail about a subject that he is particularly interested in.

When it comes to news sources Arthur is reliant on the BBC as it appears to be a reliable source. When verifying information about a news story or event, Arthur uses online searches and if the particular phenomena appears in several sources then he deems it authentic. He mentions that any opinion can be backed up online which does not mean that it is verifiable.

The interview was conducted in an empty training room in the Graduate School. was punctual and arrived on time. He is happy to talk but does not make eye contact. When researching for his degree, he uses the reputation of a journal, and if the article is peer reviewed, as verifiers for his sources. He also believes that the BBC is neutral and trustworthy as it is a high-profile news outlet which is a trend with the participants. As

he grew up in the internet age, there was no transition from using a house phone to using his mobile for contacting friends about meeting up. Plus, he never had to keep an address book as contacts' details were always kept in his phone. He has social media profiles like Facebook and Twitter but he does not contribute to them as he is worried that he will write something that comes back to haunt him in the future (such as when he is going for jobs). He just uses the social media sites to keep track of what other people are doing. However, he does chat on video game platforms.

4 Emerging themes

4.1.1 Trust & ignorance online

An important theme that has emerged in the data analysis is that of ‘trust’ and ‘ignorance’ online. This particular aspect of the data analysis has been discussed in public forums and written about in various outputs (see Section 6).

Ignorance of how digital technologies and online platforms work has resulted in *ritualised* practices of digital literacy which must be examined critically and not taken for granted as mere everyday online practice. These practices 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. Explorations 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

In this respect, there is a trend amongst participants to view the BBC as neutral and trustworthy – their sentiment is summarised as “if it’s on the BBC it must be true”. This is problematic as it is indicative of a societal trend where news consumers and users are not seeking out dissenting voices or alternative sources which is contributing to a dominative narrative predicated on power and ubiquitous dissemination.

Relatedly, when searching for sources for university assignments (such as non-academic websites like news sites), participants believe trust is in the point of saturation – if they see something repeated then they take it as authentic and verifiable.

4.1.2 Transitions in digital media use

As mobile phones were available for most participants (apart from Craig, a 'mature student'), there was no transition in learners' communication practices. That is, participants did not switch from using their parents' house phone to contact friends, to using their own personal mobile phone, as they always remember having a mobile. This is similar with the internet, as it was available during their childhood and adulthood, thus when searching for information they tended to search online rather than peruse books. Arthur, for example, mentioned that as his family had the Encyclopedia Britannica set he would have looked at it too. With regards to Craig, an older participant, he remembers switching from using a house phone to a mobile. He also put greater trusts in books for information. Thus, overall, there was very little transition from using physical resources to digital ones due to the participants' ages and the availability of technology.

The issue of transitions through study and life remains something we are looking at further in the data set.

4.1.3 Out-of-class digital literacies

The participants in the study engaged in an abundance of complex and sophisticated digital literacy practices which are emergent outside of their formal spheres of learning. The purpose of the project was to locate, recognise, and better understand these other literacies and examine how they relate (or not) to curricular work. In this way, the methods and strategies behind the participants' assignment-writing tactics rely on networks which break down distinctions between their immediate classroom context and other spaces in their lives.

It was found that some digital literacy practices were multi-layered and straddled multiple contexts in student life, and supported curricular work in ways not acknowledged by the universities. These findings are significant as they serve to reinforce the highly complex nature of student engagement with technologies, undermining a monolithic or taxonomic understanding of learners' 'digital literacy' skills.

5 Conclusion

At the time of writing this report, it is too early in the data analysis stage to formulate any meaningful emergent findings. However, one theme that has emerged through an examination of these illustrative cases (and discussed in recent papers and seminars) is that of trust in online environments.

Data analysis has shown that 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, and something which is not taken into consideration in institutional digital literacy policies and frameworks.

We also have seen that the students’ writing and knowledge creating practices were *ritualised*—that is, motivated mainly by a need to adhere to the rules of a game. 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. Technobiographic interviews showed that ritualised practices are sustained through the common experience of the instructional practices of schooling prior to graduate study. Ritualisation directs teaching and, rather than encouraging students to cultivate skills of discernment and trust in their own judgement in discerning online information, 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 be seen in the video logs (and interviews) where

students are treating assignments as tasks to be completed – a box to be ticked, so to speak, rather than using them as an exercise to learn more about a discipline.

This project applies an investigative approach to the study of digital literacies in higher education. This is one in which digital literacy is not a given and therefore needs to be discovered. Overall, in this research, what emerges is that the practices of digital literacy and writing that were observed were so diverse and unspecific that it becomes difficult and perhaps inappropriate to pin them down to a set of 'key' skills to be understood and applied in the same way in every discipline and institutional type. Through an examination of writing and digital literacy practices in localised contexts, the aim of this project has been to not only gain insights into the range of practices and behaviours with digital media but also to learn how these practices relate to how technologies are positioned by users, teachers, and technology sponsors in higher education.

6 Dissemination and planned outputs

6.1 Papers presented

Digital literacy in an age of 'post-truth'. Keynote speech for the International Malaysian Educational Technology Convention in Kuantan, Malaysia [Sept 2018]

Lead a colloquium on digital literacy research at 'Universiti Sains Islam Malaysia' [Sept 2018]

Invited talks at the following universities on the subject of 'Digital literacy and the epistemology of ignorance' presenting on the project's findings:

Lancaster University, Oct 2018

Edinburgh University, Dec 2018

Symposium at SRHE Annual Conference 2018

6.2 Papers published

Bhatt, I. & MacKenzie, A. (2019). Just Google it! Digital Literacy and the epistemology of Ignorance, *Teaching in Higher Education* [special issue on "Experts, knowledge and criticality in the age of 'alternative facts': re-examining the contribution of higher education"] DOI: <https://doi.org/10.1080/13562517.2018.1547276>

MacKenzie, A. & Bhatt, I. (2019). Lies, Bullshit and Fake News: Some Epistemological Concerns, *Postdigital Science & Education*, DOI: <https://doi.org/10.1007/s42438-018-0025-4>

[Note – The project's themes discussed in this article have instigated a Special Issue of this journal for which the PI is the guest editor]

6.3 Future plans

Date	Nature of activity	Description
March 2019	Invited seminar at University of Sussex	This is a paper on the theme 'Digital literacy and the epistemology of ignorance'
April 2019	Invited talks in Cyprus	A two week trip to deliver a number of talks at universities in Cyprus, including presenting on this project

May 2019	Future project in Morocco	Two invited talks to examine developing this project into a H2020 project in the Moroccan context
Sep 2019	Invited talk at University of Leeds	This is a paper on the theme 'Digital literacy and the epistemology of ignorance'
Ongoing	Journal special issue	Building on the themes of the research, the project PI has been invited to be one of the guest editors for a special issue of Postdigital Science & Education

7 Appendices

7.1 Appendix 1

Photos of student spaces at University A



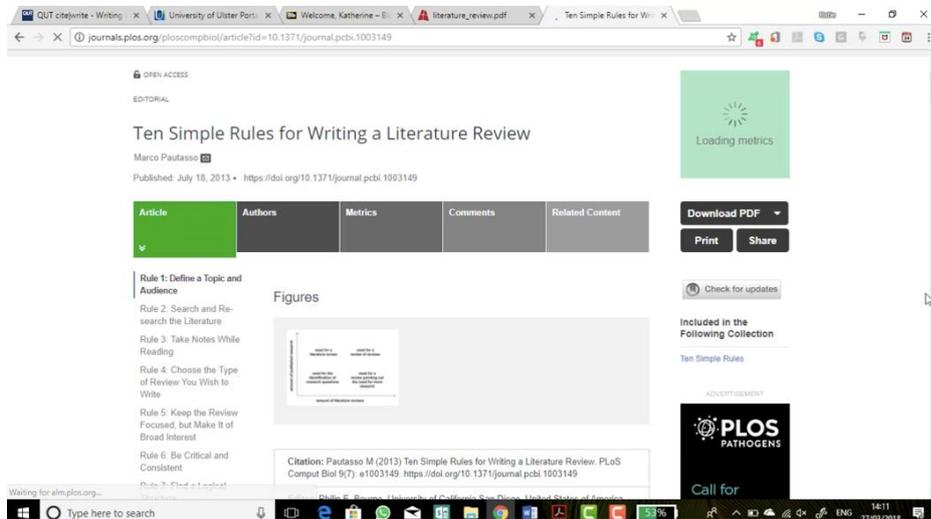
Photos of student spaces at University B



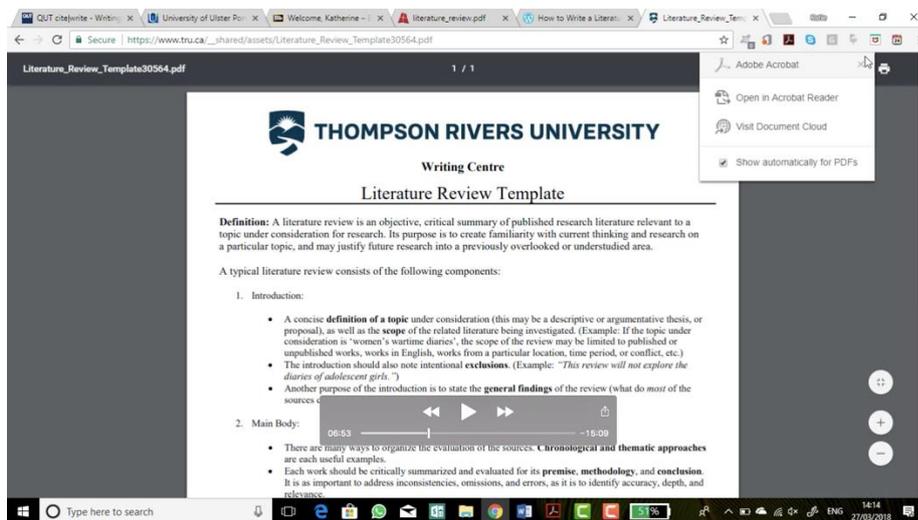
7.2 Appendix 2

Examples of screenshots from recordings

Example 1



Example 2



Example 3

A screenshot of a Google Scholar search results page for the query "psychosis and violence". The page shows approximately 88,800 results. The search results are listed in a table with columns for article titles, authors, and publication sources. The first result is "Psychosis and violence: The case for a content analysis of psychotic experience" by J. Junginger, published in Schizophrenia Bulletin in 1996. The second result is "Subjectivity: ethnographic investigations" by J. Biehl, B. Good, and A. Kleinman, published in books.google.com in 2007. The third result is "Psychosis and violence: stories, fears, and reality" by P.J. Taylor, published in The Canadian Journal of Psychiatry in 2008. The fourth result is "Psychosis uncommonly and inconsistently precedes violence among high-risk individuals" by J. Szeeman, P. Kernsally, and J. Monahan, published in Clinical Psychology in 2016. The fifth result is "The subject of mental illness: psychosis, mad violence, and subjectivity in Indonesia" by M.A. Subandi, M.D.V. Good, published in monishivijaya.ac.id in 2007. The page also includes a sidebar with filters for "Any time" (Since 2018, Since 2017, Since 2014, Custom range...), "Sort by relevance", "Sort by date", and checkboxes for "include patents", "include citations", and "Create alert".

Example 4

A screenshot of a PowerPoint presentation slide titled "Recommended Reading". The slide features a background image of a film strip. The text on the slide reads: "Recommended Reading." followed by a bullet point: "Rosentock, J, M.D. Beyond A Beautiful Mind: Film Choices for Teaching Schizophrenia. Academic Psychiatry 27: 117 – 122, June 2003,". The slide is part of a presentation titled "Week 4 Psychosis-2 Without Clips.pptx" and is displayed in a window titled "Microsoft PowerPoint Web App". The window also shows a "Share" button in the top right corner. The bottom of the slide shows a navigation bar with "OPEN IN POWERPOINT", "SHARE", "START SLIDE SHOW", and "COMMENTS" buttons. The bottom of the screen shows a taskbar with various application icons and a system clock displaying "18:53/01:37:21".

7.3 Appendix 3

Examples of videologs

Example 1

Participant:	Nusrat Khan	
Filename:	Nusrat Khan first recording and second recording	
Date collected:	Need to confirm?	
Place collected:	His home near campus	
Time of day:	4:56pm (01.36.06)	
Working on:	<i>Nusrat was writing an assignment on mental health in cinema.</i>	
Synopsis of key behaviour:	<i>First recording: flicking back and forward between writing and looking at online resources. Little time spent writing assignment in comparison to looking at resources. Indicative of lack of preparation. Uses Google searches for academic articles rather than library catalogue. Second recording: more writing and a lot of flicking between articles, Youtube, assignment and resources.</i>	
Typical for this participant?		
	First Recording	
	Time	Moment
Summary of video, identifying and locating key moments	0.00 – 01.30	Desktop. Goes to start of the document: 'Movies, Myths & Mental Illness'. Heads to 'Recommended Sources'. Goes to Resources in University A Online (QOL). Opens SSC Essay 2 in Word. Opens blank Document 2. Uses suggestions from the document to begin assignment (reflective portfolio) in Document 2. Writes 'why did you choose this module?' (which is the first suggestion) on the blank Word document.
	01.30 – 02.00	Goes to Chrome to Google 'movies and mental illness pubmed'. Glances over an article 'Movies & Mental Illness: Using Films to Understand Psychotherapy, 2 nd ed.' on movies and mental illness.
	02.00 – 04.00	Goes to recommended reading on PowerPoint (PP) about psychosis from QOL Resources. Uses another PP (Dr Dippy) from Resources (flicks through slides). Stays on reference slide.
	04.00-05.00	Flicks back and forth between Chrome, Document 2 and PP. Goes to SSC Essay 2.
	05.00 – 06.30	Saves Doc 2 'Mental Illness SSC' in folder 'Medicine 1 st Year'. Begins to write under

		heading 'Why did you choose this module' explaining reasons for choice.
	6:30	Goes back to Resources to see what other courses were available. Continues to write.
	08.00-08.30	Goes to Sky Sports on Chrome.
	08.30-12:30	Returns to assignment and writes. Saves.
	12:30-20.00	Stops writing.
	20.00-30.00	Continues to write. Refers to 'Movies, Myths & Mental Illness' for suggestions on how to write assignment. Returns to SSC Essay 2. Peruses PP on 'Dr Dippy' and spends time on the different categorisations of psychiatrists in films.
	30.00-30.15	Checks Camtasia
	30.15-31.30	Returns to 'Movies, Myths & Mental Illness' to check timetable. In Resources opens PP 'The Highs & Lows' and peruses.
	31.30-32.30	Returns to article on movies and mental illness. Goes to suggestions in 'Movies, Myths & Mental Illness'.
	32.30-34.00	Returns to article on movies and mental illness. Goes to Camtasia and pauses recording.
	37.00-37.30	Cursor moves down article.
	37.30-41.00	Inspects SSC Essay 2, and resources and 'Movies, Myths & Mental Illness'.
	41.00-42.00	Returns to writing assignment (uses heading from suggestions from 'Movies, Myths & Mental Illness'). Goes back to 'Movies, Myths & Mental Illness'.
	42.00	Pauses Camtasia recording.
	42.00-44.30	Assignment page.
	44.30	Begins writing again.
	45.30-46.00	Returns to online resources.
	46.00-46.12	Opens new tab in Chrome to search for 'intellectual disability'. Scrolls down results.
	46.12-49.52	Returns to assignment and writes.
	49.52-50.17	Goes back to online article and suggestions in 'Movies, Myths & Mental Illness'.

	50.17-50.29	Returns to assignment, misses Word and clicks on PP by accident.
	50.29-51.08	Scrolls through 'Movies, Myths & Mental Illness'.
	51.08-57.30	Returns to assignment and writes.
	57.30-58.30	'Movies, Myths & Mental Illness'. Opens and closes tab in Chrome. Back to suggestions in 'Movies, Myths & Mental Illness'.
	58.30-59.55	Returns to assignment and writes.
	59.55-01.00.45	Back to Resources QOL, flicks through PP 'The Highs and Lows.
	01.00.45-01.02.15	Back to assignment and writing. Writes "A good example is" in relation to films where mental illness is a not a taboo or the characters are characterised as weak.
	01.02.15-01.03.18	Chrome tab "films portraying depression". Clicks first result '14 Movies About Depression That Perfectly Capture the Experience'. Scrolls down page. As scrolling a pop up interrupts: 'Talk Space- WANT TO IMPROVE YOUR LIFE WITH THERAPY'. The add contains a box for email sign up for a free course. Nusrat closes the pop up. Continues to scroll. Returns to Google list of results and chooses the second result 'The Best Movies About Depression'.
	01.03.18-01.09.14	Returns to assignment and includes example of mental illness in film (<i>Logan</i>). Pauses after writing this. Continues to write.
	01.09.14	Chrome tab search "Logan Paul", then "Logan". Chooses <i>Logan</i> (film) page on Wikipedia. Looks at plot.
	01.09.30-01.10.35	Returns to assignment and writes.
	01.10.35-01.10.43	Chrome tab search "apathy". Closes tab.
	01.10.43-01.11.16	Returns to assignment and writes.
	01.11.16-01.11.45	Checks UNIVERSITY A email.
	01.11.45-01.12.12	Goes back to <i>Logan</i> (film) Wikipedia page.
	01.12.12-01.12.24	Back to assignment.
	01.12.24-01.12.33	Goes back to <i>Logan</i> (film) Wikipedia page.

	01.12.33-01.18.04	Back to assignment and writing.
	01.18.04-01.18.09	Goes back to <i>Logan</i> (film) Wikipedia page.
	01.18.09-01.18.47	Back to assignment and writing.
	01.18.47—01.19.34	Goes back to <i>Logan</i> (film) Wikipedia page. Closes tab. Back to results page (“films portraying depression”), then back to assignment.
	01.19.34-01.19.57	Saves document.
	01.19.57-01.20.05	Goes to results page for “films portraying depression”.
	01.20.05-01.20.33	Goes to suggestions in ‘Movies, Myths & Mental Illness’
	01.20.33-01.20.49	Back to assignment and writes.
	01.20.49-01.22.13	Opens ‘Notes’ on Mac. Clicks ‘New Note’ and names it ‘Structure for Essay’. Lists tasks such as ‘Talk about a film in which stigma of illness is perpetuated’.
	01.22.13-01.31.25	Goes back to suggestions in ‘Movies, Myths & Mental Illness’. Moves cursor over list as though reading. Goes back to assignment, and then to Note. Adds tasks derived from suggestions. Flicks between suggestions, assignment, Note, SSC Essay 2, the PP ‘The Highs and Lows’, ‘Dr Dippy’ PP and online article. Copies and searches for ‘ <i>Movies & Mental Illness, Wedding, Boyd, and Niemiec</i> ’ in a new Chrome tab. Chooses second Google result from Google Books ‘ <i>Movies & Mental Illness: Using Films to Understand Psychopathology</i> ’. Chooses second result which is also from Google Books for the same book. Looks at contents for the book. Writes “anxiety” in the search box for ‘From inside the book’. Peruses the findings. Closes tab. Googles “how depression is portrayed in films pubmed”. Chooses second result ‘Determining the effects of films with suicidal content: a laboratory experiment’ which leads to an articles abstract. Goes back to search results. Chooses ‘Families in Bollywood cinema: changes and context – NCBI’ (sixth result). Goes back to results and changes search to “how depression is portrayed in films scholarly articles”. Chooses second result ‘The

		Psychopathology of Cinema: How Mental Illness and Psychotherapy are Portrayed in Film' pdf. Scrolls down article. Searches for "depression". Goes back to search results.
	01.31.25-01.34.48	Returns to SSC Essay 2 then to the 'References' slide of the 'Dr Dippy' PP. Visits 'Addictions' PP from Resources QOL. Scrolls through quickly. Stops at 'Recommended Reading' slide. Back to 'The Highs and Lows' PP, 'References' slide. Back to Chrome search "how depression is portrayed in films scholarly articles". Chooses first result 'Perception of Mental Illness Based Upon its Portrayal in Film'. Scrolls down. Chooses third search result 'The Use of Cinematic Devices to Portray Mental Illness', looks at first page and returns to search results. New Google search for "mental illness in the hours". Changes search to "the hours". Chooses first result 'The Hours (film)' from Wikipedia. Scrolls down to cast list and clicks on link to for Virginia Woolf. Flicks back to online Resources from QOL and 'Movies, Myths & Mental Illness'.
	01.34.48-01.36.05	New tab in Chrome. Searches for "violence with psychosis pubmed". Chooses second result 'Psychosis and violence: stories, fears, and reality' abstract. Goes back to <i>The Hours</i> wiki page. Adds to Notes "when finding papers be more specific".
	01.36.06	Stops recording.
Second Recording		
	Time	Moment
	0.00-06.50	Begins at assignment (Mental Illness SSC), changes to a Google search in a Chrome tab for "intellectual disability". Goes to tab 'Movies, Myths & Mental Illness', pop up appears Microsoft Word Web App: "Sorry, your session expired. Please refresh the page to continue." "Refresh" and "Close" buttons are available, Nusrat clicks "Refresh" and doc refreshes. Goes to tab with article 'Movies & Mental Illness: Using Films to Understand Psychotherapy'. Uses Notes in Mac, tries to have Notes window and list of suggestions (from 'Movies, Myths & Mental Illness') beside each other. Flicks between assignment, suggestions, QOL Resources and PPs.

	06.50-08:10	Looks for doc in Finder, can't see it, looks through recent docs in Word. Finds SSC Essay 2 and scrolls down. Goes back to assignment. Flicks between Notes, PP and assignment.
	08:10-12.20	New Chrome tab, does nothing. Back to PPs from QOL Resources. Flicks between resources and assignment.
	12.20-16.17	Searches for "schizophrenia portrayed in movies" and then for "schizophrenia portrayed in movies scholarly articles" in Chrome tab. Chooses third result pdf thesis. Scrolls through and slows down on section on 'A Beautiful Mind'.
	16.17-16.40	Back to SSC Essay 2. Pop up saying "Your disk is almost full/ Save space by optimizing storage". Goes to Camtasia and pauses recording.
	16.40-18.30	Chrome tab briefly, back to SSC Essay 2. Back to tab, searches for "metal illness in movies scholarly articles"- showing results for mental illness. Scrolls through results. Picks 'Cinemadmess', stays on article briefly. Searches for "stigma of mental illness in films"- clicks on 'Scholarly articles' at the top of results.
	18.30-38.46	Takes a reference from PP and searches in Chrome. Peruses an article quickly. Goes to Athens and Shibboleth login, logins in via institution to download the article. Briefly goes over article. Back to SSC Essay 2 and flicks between assignment, resources and article. Cites article in assignment and writes. Searches for 'A Beautiful Mind' in Chrome tab, reads Wikipedia page. Continues to write in assignment using suggestion headings from 'Movies, Myths & Mental Illness'. Goes between PP, Wiki page and assignment.
	38.46-41.09	Chrome tab search for "psychosis and violence"- showing results for psychosis and violence. Searches for "violence with psychosis pubmed", clicks on some results and stays on them for a short time. Uses Notes and goes back to assignment.
	41.09-43.47	Googles "the doctor who hears voices" and clicks on Vimeo video (watches).
	43.47-01.07.04	Assignment writing, looks at PP and back to online article Rosenstock on 'A Beautiful Mind'. Googles "clean shaven" goes to Wikipedia page of 'Clean, Shaven' (film). Clicks on 'Peter

		Greene' a cast member. Goes to Youtube and searches for "clean sahven film". Watches trailer and clips and a video on patients and schizophrenia. Returns to assignment and writes. Goes back to 'A Beautiful Mind' Wiki page. Flicks back and forth between Wiki page and assignment (writing).
	01.07.04-01.37.21	In Youtube searches for "a beautiful mind nash and Alicia", watches a video. Goes back to assignment. Flicks between assignment writing, article and Youtube video.
	01.37.21	Stops recording.
		<p><i>Key moments to identify include:</i></p> <ul style="list-style-type: none"> - openings and closings - changes of task, changes of genre, changes of tools - things which mess up or go wrong - 'troubles' - interruptions (physical and digital) - anything puzzling or intriguing that we should look into further - displays of affect (positive or negative)

Example 2

Participant:	Kim Wilde
Filename:	UNIVERSITY A_KimWilde_videolog_March2018
Date collected:	Saturday 10 February 2018
Place collected:	Home
Time of day:	10:26pm
Working on:	<i>Group project for cinematic arts</i>
Synopsis of key behaviour:	<i>Informal chatting about writing the assignment, but no real discussion of content or deadlines. A lot of emoticons were used in communication.</i>
Typical for this participant?	
	First Recording

	Time	Moment
Summary of video, identifying and locating key moments	0.00 – 0.18	(Mac user). Discord chat application. Chat room with Cinematic Arts- Visual Storytelling in top left-hand corner. One admin: Name 1 ¹ *Playing Overwatch*. Film Group (two members): Kim Wilde and Name 2. Text channel 'general-chat' is the name of the session. Members of the group/class are online and talking about the group assignment. Informal greetings and people making tea/going to bathroom.
	0.18-01.48	Name 1 says that if anyone has handwritten/notes, they can be posted in 'pictures-file chat'. Kim Wilde goes to Downloads, adds a file to the chat and includes '100' emoticon which means 100%. The file is a spider diagram of ideas. Kim Wilde adds that she had sent it before but it's the only things she's done. Laughing emoticon with bead of sweat. Asks Name 2 is he has more idea (think this is Name 290).
	01.48-04.45	Name 290 wants to stick with original idea for homework and elaborate later in the week for the film. Kim Wilde responds with "Hahaha, not a bad idea". Kim Wilde wants to add poetic realism and focus on colours and lighting. Kim Wilde asks if there is anything Name 290 "DEFINITELY" wants to include in the film. Addresses him as Name 2.
	04.45-10.21	Goes to One Note, it is syncing with University B OneDrive. On One Note are folders for Quick Notes, Episode, Course Rep, and Cinematic Arts. Within the latter, there is a folder 1 st Semester and 2 nd Semester. In 2 nd Semester is Visual Storytelling; Light, Camera,...; and Acting.

¹ Online names changed for anonymity.

		<p>Kim Wilde is in Visual Storytelling and clicks on Week 01 folder. In this is a document with information on an assignment, for example, two ideas for a short film and a five-page script. Kim Wilde switches to Week 02 folder called 'Principles of Drama' which outlines the rules of drama. Scrolls down document. A pop up from Name 290 appears top right-hand corner, clicks back to Discord. Makes a joke with Name 290 and uses emoticon. Name 290 corrects Kim Wilde and tells her that "trombone shots" are when "you zoom out while moving the camera in". Kim Wilde asks for a second to look up on YouTube but Name 290 has already sent her a YouTube video detailing trombone shots. Kim Wilde thanks him and uses emoticons. Clicks on video. She says that she knows now that it is a "dolly zoom". Name 290 explains that for AS he replicated the effect in "After Effects". Name 290 and Kim Wilde chat about ideas for the assignment.</p>
	10.21-11.24	<p>Name 290 suggests a channel for stories, query if admin needs to create it.</p>
	11.24-16.38	<p>Name 1 returns and has created text channel called "story-ideas". Name 1 complains that other people have kept her from chatting in the chat room. Kim Wilde offers to do the write up of the story. Name 1 suggests using the story-ideas channel as a suppository for story ideas (giving them a working title and synopsis <i>sic</i> Kim Wilde offers to do the writing and she tells Name 1 to go back to playing 'Overwatch'.</p>
	16.38-19.12	<p>Kim Wilde types "I'm videoing you guys right now" and adds purple imp emoticon. Deletes the sentence and doesn't send. Name 1 returns that she is not playing Overwatch, it's just on the second monitor. Kim Wilde replies with emoticon.</p>

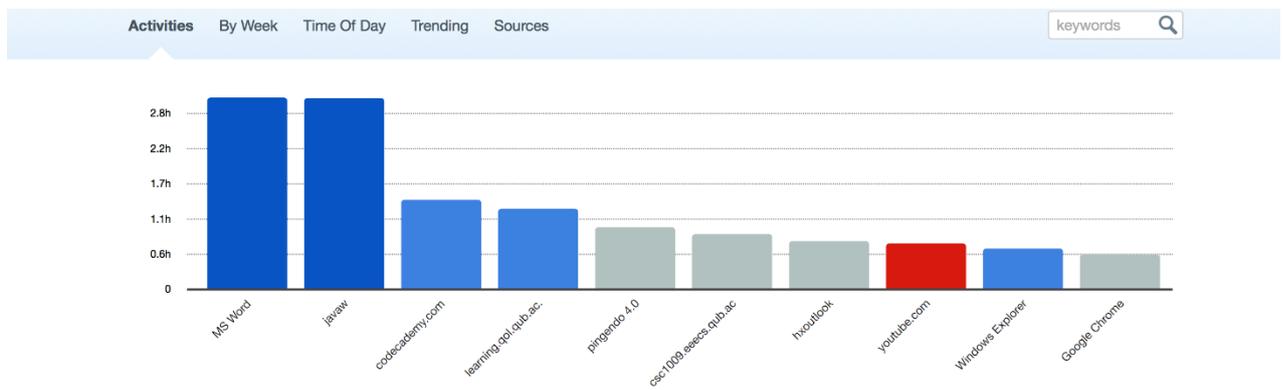
		She maintains that she doesn't mind doing two paragraphs.
	19.12-19.20	Kim Wilde goes to text channel "pictures-files" and then goes to "Organize by Channels", (pop up from Name 1), back to the channel "general-chat".
	19.20-21.16	Kim Wilde wishes for two monitors. Name 1 says that it's very handy for essay writing- not having to switch between tabs.
	21.16	Pop up top right-hand corner from Name 3 (channel for "pictures-files").
	21.16-22.02	Name 1 says that she will write out the story idea as the original was in pencil and it doesn't picture well (to send in chat).
	22.02-25.40	Switches to pictures-files where Name 3 has sent a message. Clicks on Name 3's name to send a message. Doesn't send anything. Goes back to general-chat. Name 1 says that she will put the story description in story-ideas channel. Kim Wilde replies with emoticons. Goes to story-ideas and then back to general-chat. Kim Wilde says that she put her story ideas in story-ideas. Name 1 notes that "Group Discussion" is a voice channel and they can talk.
	25.40-27.53	Name 1 is in Group Discussion, Kim Wilde adds self to Group Discussion and it says, "Voice Connected" and the volume scale appears on the screen. It appears that a voice chat is occurring, but sound is not being recorded by QuickTime. Kim Wilde goes to QuickTime and stops recording.
		<i>Key moments to identify include:</i> <i>- openings and closings</i>

		<ul style="list-style-type: none">- <i>changes of task, changes of genre, changes of tools</i>- <i>things which mess up or go wrong - 'troubles'</i>- <i>interruptions (physical and digital)</i>- <i>anything puzzling or intriguing that we should look into further</i>- <i>displays of affect (positive or negative)</i>
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7.4 Appendix 4

Examples of RescueTime data

Example 1: Tiffany's computer activity during assignment writing 1



Example 2: Tiffany's computer activity during assignment writing 2



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