Researcher Innovation in an Increasingly Digitised World

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RESEARCHER INNOVATION

IN AN INCREASINGLY DIGITAL WORLD

These interviews were conducted with two people who both studied at university in the 1990s and again within the last two years. They were asked questions about their interactions with information then and now, as it related to course materials and assignment research. The responses from our two interviewees for each question are presented side by side for easy comparison.

QUESTIONS RELATING TO RESEARCH WITHIN THE LAST TWO YEARS_

Thinking about an assignment that primarily required research, please answer the following questions_

Where did you look to find material for your assignment?

RESPONDENT 1 I used all of the business librarian's recommended links. I went to the LibGuides for business and linked off to the databases. Primarily it was MarketLine and IBIS World. I also then did, because I wanted to go further afield because it was new technologies, for strategy, I literally just Google searched for consultant reports and I found some really good things from a particular consultancy group who are in that area of technology and I found some really good articles just via straight Google searches. And that had all of the publication details and authors, so I thought that was a pretty good resource too.
I tried to get the textbook to try to connect things back to theory, but I found that the rubric of the assignments didn't require that I had to quote the text. I had the textbook next to me on the desk and didn't open it once.

RESPONDENT 2 I guess it's highly dependent on the context and the type of assignment. For more research intensive classes, I used the library website and their Primo search and I would use a string search in the search engine and just put some keywords in there and find my material that way and use some filters to looks for peer review only and look for it online. I would also sometimes just Google Scholar or Google the keywords to find some synonyms to broaden or deepen my search capabilities. I prefer online – I was an online student so I didn't physically go to a library. I did access the resources at my workplace library and I did used to borrow some physical books from the shelves, by searching their library catalogue and similar search engines.

Do you have a preference for reading print or electronic books?

RESPONDENT 1 I like reading off paper just selfishly, but for research for assignments I will go for an electronic book over it because when I start to assemble my research, I like to, if the document will allow me, to just literally just transfer chunks of content, like a highlighting thing, it helps me to connect the ideas of what's discussed in that paragraph to the next one, I like to put that in line in the document and build my reference list as I go, so I know that content's come from this and then I like to call back to the actual direct text instead of having to switch between windows, I like to just have it all just in line in the document like a scrap-booking process.

RESPONDENT 2 Always electronic books, just for ease and I can save just the chapters that I need out of there and use the citation tools that are available to save some manual referencing. Also just for convenience when you're busy and not on campus.

Do you have a preference for reading print or electronic articles/reports/short pieces?

RESPONDENT 1 Probably electronic then because it's only short and the whole eye strain downsides of having to settle for the screen don't seem to be as bad when it's a short piece.

RESPONDENT 2 I generally aim for peer-reviewed journal articles, context dependent. At times, if I just need to go and source some of my own ideas, I often will use a short piece or report to consolidate understanding, but not necessarily for referencing. Definitely I work on a desktop computer so I can have multiple windows open. I don't find smart devices – iPads and phones, user-friendly when it comes to electronic recourse. And even laptop screens are too small when you have multiple pages open. You can split the screen on the desktop quite easily and still navigate the screen quite easily. I rarely print anything – I'm trying to save the planet. I can have multiple tabs open and skim – it's not a linear type of reading, you can cross-reference more easily. You can have screens open and have journal articles and go to their reference list and if they're online they often have hyper-links. So you can go deeper and go to the original source, it's easier to get closer to the original source. And I take advantage of the hyper-links. I stay on the publishers usually, after skimming, if I think I'll use the article, and think it will be referenced, I'd download it.

How do you annotate or mark-up/make notes of useful information?

RESPONDENT 1 I try to go for the scrap-booking, so when I see something I like I'll scrapbook and copy/paste and start assembling it in this montage of ideas and thoughts with the references of all the ideas as I go. In my word doc, either in Google Docs if we're doing something collaboratively in a group, or in my own Word document if it's my own. Making notes, sometimes with the Surface Book, has the stylus, and I can go in and I just do highlighting directly on the PDF. That's pretty rare though. I don't like having to keep flicking back to the document and wondering what the highlighting – why I found it interesting. And if I can put it in the context of my scrap-booking thoughts it makes more sense if I put it in the context of other thoughts.

RESPONDENT 2 I do not annotate as I'm reading on the screen, I don't use any annotations on screen, but I do use old school Post-It notes and write myself notes and stick them to the desk that I'm working on. And I do highlight – the easiest way to remember an article that I want to go back and look at again or research again is author name. So I just make a note of the author's name, first author, and second author and just a few words from the title to remember what I'm thinking of downloading. That goes on the Post-It note. I don't use online highlight – I don't download the document until I'm absolutely sure I'm going to use them.

Can you describe how you save/store your resources?

RESPONDENT 1 Dropbox folder and I literally start dropping journals in there, I'll download the PDFs if I can. And if that doesn't work I'll make a folder for that assignment or subject and I'll just bookmark them in Chrome. So I carry bookmarks with me if it's web references, and if it's references to documents then I'll take a PDF copy and put it down to my Dropbox and then get all the details – I did use at one point 'cite this for me' to do quick referencing for me and then put it into Word referencing system. I never got my head around

RESPONDENT 2 I have several ways. Initially I started using the shelf in the LibrarySearch tool, like Primo, it was the library shelf you could save. But because that stores them all and there was no way to group them, I found it just got too overwhelming after I'd been doing a few subjects. So instead I have two systems. I use EndNote on my desktop and I have my library open and the course folder already set to go and I'll save from Primo – I'll use RIS feed and save it into EndNote. And just to ensure that I've got the PDF document

EndNote enough. I never felt as if I needed it. I felt confident enough to do the referencing pretty manageably. I did eventually figure out the Microsoft way of inserting it and managing it.

Did you create different folders in Dropbox?

Subject code, assignment or area of content or study, or assignment specific thing and then I'd just start dropping things in there. Subdivided further if needed but usually it just ended up all in the one specific assignment folder.

when I want to access something, I'll also download it and I have a folder saved on my desktop at home in the course, and I'll plant in there and save it with the author's name. And actually that's what I use when I begin writing my assignment, I'll open up the PDFs, I don't go back to the publisher's site or database.

How do you store/manage web content, for example a webpage without a PDF?

RESPONDENT 1 Bookmark it or print it to a PDF if it looked too horrible or I felt the content was a bit too fleeting or if I felt I may not come back to this. Or if I'd try to go back to it again, if it said 'you've read too many free articles on this site', I'd do a PDF export when they'd let me see it.

RESPONDENT 2 I'd open a word document and save it in the course folder and I pretty much just plonk the link straight in the Word document. Save the hyper-link in the Word document just in an list.

QUESTIONS RELATING TO RESEARCH IN THE EARLY 1990S_

Thinking about an assignment that primarily required research, please answer the following questions_

Where did you look to find material for your assignment?

RESPONDENT 1 Straight to the printed section. I would use some Internet references, but the Internet was still relatively immature back then and sources were dubious. From a printed book felt more, a textbook or journal felt like it had more authority. I'd probably start doing some … speak to the lecturer or start doing my own Google searches to figure out what the best sources would be and go straight then I'd just go directly to the library.
For my recent study, I wouldn't request the library's assistance, I'd mostly just go on what I felt was right. Literally I'd sometimes just browse the resources they had and select the most appropriate one.

RESPONDENT 2 In 1993 was my first degree. I think the Internet came out in 1994 and the second time was in early 2000s. First time I had an electronic typewriter and second time I did inherit an old Commodore 64. I used dial-up and word processor, it was very slow.
I was blessed that my father was a writer and has an Encyclopaedia Britannica set at home, so I'd use the encyclopaedias there. I'd then have to physically trek to the library on campus – pretty much print books and journals in magazine format more recently And then in the 90s journals were on microfiche. And you had to go and book a time to go and use a machine. I think there were 4 microfiche machines in a darkened room. You'd have to book your time to go in there and you'd find all of the ones you could. There was a library tech in there who'd help you load it and you'd get what you could in that quick time and you'd take physical notes.

How did you know that what you wanted was in a particular journal?

They had an index or contents page so you pretty much knew. They'd have a catalogue list with cards

of the journal that they had on microfiche, and they were in subject headings. So if you wanted journals on psychology you'd go and find the title of the journal and the library tech would go and get the microfiche. You wouldn't physically handle the microfiche, they'd put on gloves and load the machines. They had a little bit of a description, just generally the type of journal articles that had been submitted to that journal in the catalogue.

Do you have a preference for reading print or electronic books?

RESPONDENT 1 No electronic books.

RESPONDENT 2 I tried to be really eager at the beginning to use the microfiche and in the end, just the inconvenience and constraints of organising a time, it was often booked out. Finding the material that you wanted was far easier to try to locate a book on the shelf.
Reading off the microfiche screen was not easy at all. You can imagine it was really dated. It was like a black screen, it just wasn't user-friendly. It wasn't an easy visual format. Sometimes lots and lots of words, really small screen. There was no graphic design. It was pretty much like a typed document in very small writing. It was not easy to read – you could zoom in physically, but it might cut off the paragraph or something. And the techs didn't like you touching the machine.

Do you have a preference for reading print or electronic articles/reports/short pieces?

RESPONDENT 1 Sometimes someone would do a – for creative content like film and television or creative content – someone would give an opinion piece or something on the Internet. They'd write a little essay with references and if I felt it had enough authority, like it would pass muster with the lecturer, I would get some journals or essays off the Internet. But they were never academic journals. They were more opinions or references to cultural stuff. I read it straight off the screen. It was totally fine. Very convenient.

RESPONDENT 2 There wasn't a lot of electronic. The print journals there were, not a lot because they were very expensive, but definitely, if you could I would. But because there was not a lot of resources or copies you had to be a diligent student – get to the library really early in the morning or they'd be off the shelf. People would keep them in the library and use them all day.
I had compiled readings with plastic binders that would have some of the journal articles in there and sometimes a book chapter if they could. And they were very heavy and they were usually for your course materials but not for research – they didn't want you rehashing what was in there.

How do you annotate or mark-up/make notes of useful information?

RESPONDENT 1 Pens and highlighter because most of it was paper. Very rarely would I find stuff online. Books from the library I'd bookmark with my 3M notes and little notes on pages.

RESPONDENT 2 You just had physical notes. I had pages and pages of notebooks. And I would just use those and then get on the typewriter and type up, using your pages. You'd have to make notes as you were reading and physically make the reference correctly because you'd have no chance to go back. I had a notebook for each subject back then, like a binder and I would have to write everything I needed in the one book and then you'd just have that book handy when you got on to type up your assignment. I had to write the assignment more

than once because I wouldn't really edit, you had drafts. You had a rough draft, we opted just got our notes into a typed format then your first draft, second draft and then your polished copy – so three versions with the one assignment.
Very manual task, time-consuming.

Based on what you said, do you think you got more out of your materials from handling the materials physically?

I do think you consolidate your understanding more of a topic, by going over the few materials you may have found on a topic because you did go into them quite deeply, as opposed to looking at a vast amount of material, but perhaps only skimming it and touching on it lightly. You definitely have a breadth of knowledge more recently, you definitely touch on more knowledge, but I definitely don't feel like I had a deep grasp that would go into the long-term memory, like I did for my first degree. I still remember for example Vygotsky's theory of interpersonal development and Piaget. But things that I've learned more recently I don't think I can comfortably quote or refer to the scholar or encapsulate their whole theory, like I haven't consolidated the understandings more deeply. But I definitely know more on the overall topic.

Can you describe how you save/store your resources?

RESPONDENT 1 I would carry the books around full of 3M sticky notes. And any printouts I had would be shoved, usually in a big pile, inside a Spirax notepad. I can't remember if I had manila folders or not. I think I tried that whole organisation system and was like I don't want to carry both the folder and the notepad, so I just started using inside of the notepad. I would just shove them in there and I'd have this scattered big pile of mess and I'd forget which thought connected with that thought on another document and different things so that whole mind mapping process just became could I remember when I sat down, could I remember what I wanted to do if I hadn't started putting that Word document together to start writing the essay.

RESPONDENT 2 N/A

So the visual cues of the sticky notes would help you work out what you needed and what would go where?

Yes, that's right.

How do you store/manage web content, for example a webpage without a PDF?

RESPONDENT 1 Actually I'm thinking now I did print them out. I'd take them with me because printing web pages and content off the Internet was the

RESPONDENT 2 N/A

kind of thing you did. Because laptops weren't as common as they are now.

QUESTIONS RELATING TO COURSEWORK WITHIN THE LAST TWO YEARS_

Considering how you studied for a coursework subject, please answer these questions_

During lecture and tutorials, how do you take notes/record information?

RESPONDENT 1 This is where the Surface stuff with Microsoft, not that they're the only company that does this kind of thing because Apple does it with the little pencil thing, the iPad Pro, and these other stylus type devices you can get, but Microsoft has got the good integration with OneNote. So OneNote is like your little online notebook where you can make a single notebook for the class and I make new tabs for every subject within that notebook. Then within that tab I make a page for each week. Then within that page you can insert PowerPoints as a print out of images, so it will literally just render each slide of the PowerPoint into an image and it will drop them linearly down the page and you can have ruled lines or grid lines as your paper behind the images. So you'll end up with a giant stream of images down this long document with lines beside it. And then I just get my stylus pen out and draw beside the slides and make notes beside the slides as I go. And if the lecturer just passes over three slides quickly without any details, you just keep scrolling down the document and get to the next slide where he might go alright, let's look at this slide in more detail, let's do some mathematic formulas for finance and economics, you can do the pinch to zoom. You can zoom right in a draw fine detail and graphs with your pen, and go back out again. If you think you haven't left enough room, or if it's the whole wall wide and you want to emulate what he's doing, you just zoom in a draw a lasso around it and move your text over. It's got that nice infinite canvas, undo-able, erasable, zoom in-able , change you pen colour, width, so you can do finer drawing, thicker drawing and highlighting. It becomes a virtual desktop thing with all the tools. And all the other classmates were looking over saying "I'm going to get one of those."
I hate carrying chunks of paper around, hate carrying notebooks and printouts, because by the time you print all the slides – 70 slide PowerPoints and if you print them on an A4 age, I usually went for 3 with the line sections. By the time you print out your notes, you end up with scrawl in there on really content dense slides, and then nothing for 10 and that's for 1 week. And then you do the tutorial and you have more and then you do it the next week, you end up with 12 weeks of content times two potential tutorials. You end up with a ream of slides with lots of wasted paper and lots of

RESPONDENT 2 In my recent course there are not necessarily lectures, there are online meetings that are scheduled throughout the semester and they are live and interactive with a chat-room. Otherwise all of your other content are embedded in your Blackboard site into modules, that you would work through at your own pace, although they would give you a guide at the beginning of the course, on where you should be each week, but it's really up to you how you navigate your site and when you address your materials. In that module is the lecture materials, not PowerPoint set or anything, just a module with activities within that module. It's pretty much online but often they'll put a PDF and I do like to print those and I do like to write notes.

Are the online classes, like the meetings, is that recorded or can you save things from that?

Yes, they do record them, I tend to watch them live, because I find I'm not motivated to go back and watch a recording. They do record them and they usually have a PowerPoint presentation, in the online meeting, but usually just two or three over the whole 12-week course.

overused sections of paper. Plus, another notebook, you end up with a stack of paper you have to flick through and try to search through
and I can emulate that whole experience in a single devise and piece of software. It was no contest for me. As soon as I could use the Surface, and OneNote, the conveniences of a single point of storage. Plus, it's cot the convenience of you web browsing.

Do you have a preference for reading print or electronic textbooks, if they're available?

RESPONDENT 1 For reading for pleasure I still like print, but I'm strongly preferring getting the textbook material electronically now because all my other resources are electronic and I'm trying to do everything on the screen. It actually feels like I have to break track a little bit – I have to go off course if I have to go back to the textbook. Trying to keep everything online and on the screen as much as possible, so I'm preferring the textbook on the screen. It helps with the cutting and pasting, scrap-booking idea too for laying out my assignment.

RESPONDENT 2 Usually they're electronic and they're available online. I find that really difficult, I don't like reading textbooks online at all, and it depends on where it's hosted, but just if you're reading, sometimes it takes a long time to load and you want to just skim through from the contents. And they take a long time to load up, and then you want to go back, and again the page goes bland and it takes a long time to load. If you want to download, you can only download a chapter at a time, which is an inconvenience. I buy the textbook. For a textbook where there are a lot of readings for the weekly modules, I'll physically buy the textbook.

Do you have a preference for reading print or electronic versions of assigned readings?

RESPONDENT 1 Always prefer them electronically. The only time is when it's a horrible scan from an old business journal. Like an old Harvard Business Review, like something from the 80s or 90s. Old scanning technology or printing technology that someone's scanning again. Sometimes then it's better to just print it out because it looks like an eyesore on the screen or it's not rotated properly, print it, figure it out yourself and then it's actually easier to read off paper because it's so awkward to read off-screen. They're more common than I'd like but they're definitely the exception.

RESPONDENT 2 Electronic – usually the hyper-links are embedded but if they're not, usually they'll say they're available on the library site. There's no link actually from Blackboard to the library search, so they provide you a reference and you have to go find it. It's up to you to go and find it. I read them on the computer. If I think I'll use it for an assignment, just to show that I've done it – more of a compliance – to show I've done one of the readings for the module, I'll save it in EndNote and in a folder on my desktop. Not printing.

Can you describe how you save/store your resources?

RESPONDENT 1 It's no different for coursework and assignment research – same thing.

RESPONDENT 2 I print the modules in PDF and I write notes on my module sheets. And for the lecture of the online meetings, I print the PowerPoint slides and write on those slides as they're speaking, handwriting.
I have just put in notes in my textbook, and put little bookmarks in there. I don't deface the textbook, or write in it because I sell them after the course. So I want top dollar – I don't mark them or highlight them, I just use Post-It notes.

QUESTIONS RELATING TO COURSEWORK IN THE 1990S_

Considering how you studied for a coursework subject, please answer these questions_

During lectures and tutorials, how do you take notes/record information?

RESPONDENT 1 Notepad and pen and would possibly have the PowerPoint's the last time I studied, it was still the OHP slides, projectors and that sort of stuff weren't all that common 15, 20 years ago. A lot of it was just writing stuff. Writing over handouts they give you. They give you handouts in class and I'd scrawl all over the top of that. So it was in context. If I made notes it was relevant to the stuff we were talking about.

RESPONDENT 2 The lectures were just a person standing out the front of the classroom. They may or may not have had an overhead transparency sheet with some handwritten diagrams and things to support their speech. It was pretty much just a talk, there was not a lot of interactivity going on. Often they may, towards the end of that degree, they had actually photocopies onto the transparency sheet, so they may have had a book chapter and we would read it in the theatre.
They'd zoom in and I had my binder book and you took physical notes as they were taking. If you did not concentrate – lectures went for 2 hours with a 10 minutes break – it's really hard to sit for 2 hours and pay attention to someone teaching. If they didn't have an extremely engaging teacher presence, I'd often switch off and wouldn't get the notes I needed. And there was no way to redress. Often the lectures were just rehashing the prescribed text, there was not a lot of personalisation.

Do you have a preference for reading print or electronic textbooks, if they're available?

RESPONDENT 1 No electronic textbooks back then.

RESPONDENT 2 No it was all print.

Do you have a preference for reading print or electronic versions of assigned readings?

RESPONDENT 1 No everything was handouts – like iLearn concept, getting all your material off a subject website – no. It was handed out in class or go and find it at the library.

RESPONDENT 2 No it was not there. I think they did have a big brick. And you'd actually have to pay for it. And it was done by the print shop at the university, with the copyright thing. It was a big book and it wasn't very sturdy – often pages would…it was just bound with plastic. So for travelling between campus and home and in bags and things, it wasn't very sturdy. Also I guess one thing that was really different, between the generations and managing the resources, was you had to have that foresight what you'd potentially want for your assignment, so you really had to have a look at the concept and decide on a task early on. Because there were not a lot of copies available in the library and there was no way of finding out … you could maybe find out when a book was potentially due back, there were no holds, no reserves.
You went to the shelf – the shelves were quite extensive, there were lots of materials on them. Usually the top quality books were borrowed out at the beginning of the course and not returned

until the end. Or people would hide them on other library shelves to go and get them later. It was not easy. You had to have a game plan, stick to it, make friends, and network. You really had to have a network and make friends to share physically the books between yourselves. So if you got in with a good group, you definitely had an advantage – lots of politics.

Can you describe how you save/store your resources?

RESPONDENT 1 Same thing as the assignments – the notebook with all of the handouts from class shoved into a page so the notebook was also a notebook and a folder. The 3M sticky notes as the little tabs off the side and lots of little scrawls everywhere.

RESPONDENT 2 N/A

FINAL QUESTIONS_

Consider your physical workspace/desk and your computer_

How does your organisation, storage and retrieval of information compare?

RESPONDENT 1 I do everything online. If the lecturers are still giving out handouts now, I will take it and scan it and then insert it into OneNote. If I have all the PowerPoints in a big stream in a OneNote page, and he still insists on giving us handouts because he's still got a template he wants to go through in class, I'll take it, scan it and drop it into the OneNote page so it's all in context. Then I can write over it with the stylus and highlight things later on. I try and emulate all of that and I don't like having any paper sitting around on my desk, so I actively try to avoid it. So I don't have any folders on my desk or paper, but on my desktop I don't have an emulation of that. Occasionally if I have paper on my desk, its' just the most recent documents that I haven't figured out if I need to archive them or where to file them, and with files on my desktop the same thing. If I'm not really sure if it goes in a spot yet, it might be a temporary working document that might not be relevant in a couple of months, I just park them on the desktop. And it only gets to a certain size, maybe a couple of rows then I delete it and clean it up. Same with my desk, if it gets too cluttered I make a decision and get rid of it, but I'll allow a small amount of minor clutter. That might be for work. For study, there will always be a Dropbox folder or a place to put everything.

RESPONDENT 2 I actually have an allocated space with a desktop and a large trestle table and I keep stationary, staplers, Post-It notes handy, printer is available and within reach. I have a very ergonomic desk. The chair's really uncomfortable, but the desk is ease of use, so I can sit down when I've got a minute because I'm studying and working. Same with my systems organisation on my computer, it kind of matches. It's very strategic. I make sure I've got the folder saves and my EndNote library group organised. And that I even email myself because I do find that I'm not very good with USB sticks and I have teenagers that will often go on the computer. At the end I save everything to the desktop and I always email myself before I leave the computer so there's always a virtual copy of whatever I'm working on out there, usually to work email as well as to Gmail, so I can always allocate and I have a back up in the cloud somewhere.
I do have a physical filing cabinet. I have an A4 display book for each course with all my content and all my maple material in there. And my assignments go in the back, because I often find that I will refer to another subject's assignment and course material for a completely different course. So they are all colour coded in and once I've finished with them they go in a physical filing cabinet.

The physical and digital system aligns?

It's true, as I'm working, it's organised chaos,

and even in my folder as I'm saving things in there. But towards the end of the course, or as I'm working on an assignment I do arrange my online folder by name or most recently created so that's in some sort of order usually at the same time as I'm organising my physical space as I'm getting prepared. So as I'm working they can look very similar – they're a little bit messy and things are open and modules pulled out of their display books and things. I'm saving lots of PDFs with names and things.

On my folder and I have lots of tabs open on my screen. I tend to sit down for an extended period of time and hash it out and maybe do it over a 6-8 hour period. It's the same when I'm doing my lectures and things, I have one day a week where I do them back to back, so I do all of the modules and readings and activities and then that's it until the next week. So I guess that's my time management, organisational skills in physical and digital formal all aligns.

Do you think that the shift to increased online materials has helped or hindered your research practices?

RESPONDENT 1 Helped because you can get a broader range much faster. Because I don't like being burdened by a lot of stuff – I've done it and can do it and it's not a huge deterrent to have a huge desk covered in lots of resources – I'd prefer not to do it. I'd prefer to have lots of tabs opened. You can get overwhelmed by that but at the same time you can get quick access to resources you would have to normally have to borrow or dig through or flick through or try to find a spot on your desk for.

RESPONDENT 2 Two beliefs: definitely helps in that I can access way more material and get a wide perspective as far as my mental health goes, information overload is a real problem. And I do find that I get headaches and I do get some confusion – it's just really hard to keep your brain focussed and on task when you have so many tabs open and you're looking at so much material. It is quite stressful for the brain. But as far as perspective and gaining insight, definitely broadened and deepened.

What do you think are the advantages of print resources? And for electronic resources?

RESPONDENT 1 The advantages of print resources are definitely, slightly easier on your eye from a selfish point of view for when you're reading for pleasure. It's a bit nicer to read off something that's not glaring. With electronic resources, glaring and electronic is unpleasant, but the advantages are searching, finding your relevant content straight away. Digital storage – there's the benefits of so much more. For someone who doesn't like to be encumbered with books and files and papers.

RESPONDENT 2 Print resources – you can take them anywhere and you can go and physically sit under a tree or at the beach and take your course materials with you and you can read them outside, which is nice for a break. Read them on your bed laying down quite easily. Electronic resources – because you need to be organising them and managing them as you're reading, I prefer at a desk. I have tried working from a laptop, but again I have those screen issues on my bed or even an iPad. And also you can't read electronic materials outside, so you're really limited with the sun an reflections, and you just can't read them.

What are the advantages of note taking/writing an assignment/studying in the physical and digital environments?

RESPONDENT 1 I think the process of reading and I don't know whether or not this reflects in your learning to output or grades or anything, I feel it's a bit slower and more deliberate. You've got to work a bit harder and you might think about things a bit

RESPONDENT 2 I am very conscious that the digital environment enforces more desk time, whereas beforehand, you physically had to move to get to resources, you had to visit a library, so you actually had to make a trek, a physical remove

more and the process of just writing and ideas, because the handwriting process might make you consider an idea in a little more detail, it's a little bit more deliberate. I think I've been aware of that though when I've been studying in the digital environment, so I think the advantages of less stuff to manage, less stuff to physically carry around – textbooks, papers – sometimes it might feel a bit hurried, in terms of just flicking between tabs and resources and your mind might be darting. You can just open a new tab and just spin off a new thought, whereas the paper forces you to slow down. I still think that I've been aware enough of it that I can still consider the thoughts with the digital environment and benefit from the searching, storage, digital, lightweight, unencumbered, pick it up and go quickly.

You're able to self-manage to include the benefits that you used to get from print study...

RESPONDENT 1 I think I can get them both out of it. Because it's so easy just to spin off 1000 tabs and research for 100 journals and have it all really quickly amassed – it's easy to get addicted to acquiring all that. Thinking I've got everything covered here, and then you lose sight of following up on all of those things and it because a bit scattered. I've been aware of myself doing that and honed it back into how my mind used to work, working with physical stuff. Now I spend the time thinking about all those individual ideas.

Print has trained you and you're applying it digital?

RESPONDENT 1 Yeah, because if you had a table like this meeting table, and you had a book there and a book there and a book there and you had it open on a certain page and you were starting to think and writing it out, and it would take significant effort, I think you're a bit more deliberate and careful with your thoughts, you've got to conserve your effort a little bit better. And with digital it's just like digital cameras. When you take film versus digital photo, when you've only got 24 shot you've got to make it count. With digital you can just hold down the shutter button all day if you want. But I've been aware of that – bring some more deliberate thoughts to the digital side of things. Stop getting scattered with all of the millions of tabs or whatever.

yourself. The amount of desk time we do is quite concerning, so the digital environment is actually exacerbating that because you don't have to move physically, so it's a health issue. Digital definitely for convenience, because the information is there at your fingertips when you need it. But for actual work environments the physical environment again, being able to work anywhere as you wish with a pen and paper, you still had to use the typewriting, so that wasn't the best. The efficiency of a digital environment is more efficient. The pen and paper is more physically demanding and you get a sore hand. In the digital environment I go straight to a typed draft and that just gets edited and edited and edited. I don't even save a draft, I just save as I go on top of each one.

BIBLIOGRAPHY_

Conard, M., Barbour, M., & Marsh, R. (2017). College student work Habits, Interruptions, and Stress. *i-Manager's Journal on Educational Psychology, 10*(4), 1-11.

Davidovitch, N., Yavich, R., & Druckman, E. (2016). Don't throw out paper and pens yet: on the reading habits of students. *Journal of International Education Research, 12*(4), 129-144.

He, D., Wu, D., Yue, Z., Fu, A., & Thien Vo, K. (2012). Undergraduate students' interaction with online information resources in their academic tasks. *Aslib Proceedings, 64*(6), 615-640.

Hoffmann, R. L., & Dudjak, L. A. (2012). From onsite to online: Lessons learned from faculty pioneers. *Journal of Professional Nursing, 28*(4), 255-258.

Kadli, J. H., & Kumbar, B. D. (2013). Library resources, services and information seeking behaviour in changing ICT environment: a literature review. *Library Philosophy and Practice*, 1-26.

Silva, C. (2017). *Reading in the 21st century: Perceptions of current faculty and students* (Doctoral dissertation). Capella University, United States of America.

Thompson, P. M. (2012). *The popular profile of the digital learner: technology use patterns and approaches to learning* (Doctoral dissertation). Michigan State University, United States of America.

Watkins, R., Corry, M., Dardick, W., & Stella, J. (2015). Note-taking habits of online students: value, quality, and support. *Quarterly Review of Distance Education, 16*(3), 1-12.

Wu, M., & Chen, S. (2012). How graduate students perceive, use, and manage electronic resources. *Aslib Proceedings, 64*(6), 641-652.