Student perceptions of reading digital texts for university study

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Abstract

An increasingly important aspect of undergraduate study is the ability to deal with reading academic texts digitally. Whilst the literature suggests that students prefer reading print texts (Foasberg, 2014; Mizrachi, 2015) and often have a deeper level of engagement with texts in this medium (Mangen et al., 2013; Delgado et al., 2018), the reality is that, for most students, digital texts are the norm. Study guides often focus on reading strategies that are considered broadly applicable to both digital and print formats. However, the differences between the two mediums are likely to impact on the strategies used, with students developing their own approaches as they gain more experience. In this paper, we present findings from a study exploring students' perspectives and practices in relation to digital reading. We carried out focus group interviews with 20 students in their second or final year of undergraduate degree programmes. Our analysis reveals that reading texts digitally does indeed form the bulk of students' reading activity, with ease and speed of accessibility, cost, and environmental considerations influencing this choice, and in some cases, precluding reading in print. However, despite the prominence of digital reading, some aspects of print reading – in particular the scope for more sustained focus, detailed reading and enjoyment of the experience – were highly valued by the students. Students' approaches to reading digital texts varied depending on reading purpose, but, in general, students had developed a range of techniques to help them navigate digital reading.

Keywords: academic reading; digital reading; print reading; note-taking; reading preferences

Introduction

With the closure of physical libraries, the Covid-19 pandemic brought into sharp relief the reality that, for contemporary university students, academic reading involves large quantities of digital text. Even before the pandemic, it was clear that an increasing amount of students' reading was done digitally. It is not uncommon for libraries to have 'digital first' policies and purchase only the e-book format of new texts, and many libraries no longer stock print editions of some journals (Hardy and McKenzie, 2020; Baxter et al., 2021). In addition, the proliferation of online sources has had an impact on the number and variety of sources that students can cite in their academic writing, making it increasingly less feasible for students to consult only print texts in their studies.

In this article, we present the results of a research project that explored student perspectives on digital reading for academic study. We wanted to find out what influences students' choices around reading medium, the strategies they employ when they read electronically and how they navigate the challenges associated with studying from digital texts.

Literature review

Since Marc Prensky (2001, p.46) described a generation of 'native speakers of digital language' 20 years ago, practitioners have wrestled with ideas about the inherent digital proficiency of students born in a digital age. Palfrey and Gasser (2008, p.22) depict native digital learners as flexible and skilled at managing digital mediums: 'they get news and information through some kind of high-tech osmosis over the course of a day. They dip into rivers of information that are flowing by'. Indeed, Lea and Jones (2011, pp.390-391) argue that students are 'adept readers in an increasingly complex digital world'. However, several authors have argued that the digital native is too simplistic a concept (White and Le Cornu, 2011). For example, Jones and Healing's (2010) research focused on first-year students' transition to university and concluded that the lack of homogeneity within the cohort in terms of previous experience of technology meant that making blanket assumptions related to age and digital proficiency was problematic. Furthermore, Hansson and Sjöberg (2019) found that, although students arrive at university with prior digital

experiences, they continue to develop their digital skills during their studies, particularly in relation to using software and critically evaluating digital sources.

One important area of development for most students is the critical reading of academic texts. However, a number of studies have suggested that the skills students have gained as digital surfers may in fact reduce the ability to engage in deep and focused reading. Delgado et al. (2018, p.34) suggest that on-screen reading leads to inferior comprehension and that people 'adopt a shallower processing style in digital environments'. Moreover, Ben-Yehudah and Eshet-Alkalai (2021) demonstrated a clear digital inferiority when students' reading comprehension was determined through questions that tested an in-depth level of processing. Similarly, other studies have found that reading print text does facilitate deeper learning and less 'mind wandering' than with digital texts (Ackerman and Goldsmith, 2011; Mangen et al., 2013; Kong et al., 2018; Clinton, 2019; Latini, 2020). As such, it seems that neither general digital experience gained through surfing and scrolling, nor the digital medium itself are conducive to deep and focused academic reading.

Research on student preferences for reading shows that students often prefer reading in print for learning purposes (Foasberg, 2014; Mizrachi, 2015; Hancock et al., 2016; Jeong and Gweon, 2021). Some researchers have argued that the tactile nature of print can support memory encoding (Baron et al., 2017; Mizrachi et al., 2018) and aids in the immersive experience of reading, involving emotional and bodily interplay in the reading process. Mangen et al. (2019, p.38; also Mangen, 2016, p.248) refer to this as the 'sensorimotor cues which are afforded by the manipulation of the book'. However, Schwabe et al.'s (2021) research found no notable differences in the emotional experiences of readers using e-book and print versions of narrative texts. Interestingly, Mizrachi et al. (2018) found the type of digital device is of central importance to students' perceptions of enjoyment and efficiency, and that some devices are more conducive to an enjoyable reading experience than others. It is clear that reading is about more than language and text, and the physical affordances of medium (print or digital) and device are important factors in the reading experience.

The studies discussed above show that medium can influence both the depth of comprehension and the enjoyment of reading, yet when it comes to published guidance specifically on academic reading, the role of medium seems to be underplayed. From our

survey of over 20 different reading guidance publications and websites, the content tends to include little specific discussion on engaging with digital texts and implies that practices and strategies are transferrable across the two mediums. Where there is guidance, it can be fairly light touch. For example, Cottrell's (2019, p.217) classic text *The Study Skills Handbook*, asks students just two questions in the brief section on digital reading; if they know whether they 'read best from screen or paper' and if they 'reformat text on-screen to make it easier to read'. Van der Gaast et al. (2019, pp.29-30) provide some guidance on how to deal with distractions when studying online and encourage students to make handwritten notes. Reinders et al. (2017) devote a little more space to reflection and discussion of the differences between media, and the benefits and drawbacks of each. However, our overall impression is that advice on digital reading in such publications remains brief. This may be in part because, as the Quality Assurance Agency for Higher Education (QAA) project investigating active online learning explains, 'we know strikingly little about how students read online' (QAA, 2021). This study aims to address this gap by exploring students' experiences of studying using digital texts to gain insights into effective practices for digital reading.

Methodology

The starting point for this research was a series of reflections from our work as Learning Developers. We had noticed that when students came to us to talk about reading, they no longer arrived with a stack of books, but rather a laptop with 20 windows open. It was clear that students were doing more and more of their reading electronically, and that our previous experiences of reading for university study were increasingly different to those of our current students. We felt that, in order to understand the reading practices of contemporary students, we should hear directly from them about their experiences of reading and studying from digital texts.

We took a qualitative approach, as qualitative research 'is interested in the perspectives of participants, in everyday practices and everyday knowledge' (Flick, 2008, p.2). Moreover, Baker et al. (2019, p.150) argue that qualitative methodologies focusing on recovering the student voice, reveal the 'complex negotiations that students make in the reading process'.

As such, we set out to hear from students about their reading experiences, and we aimed to address the following research questions:

1. What are the benefits and challenges of reading digital texts for academic study?
2. What strategies do students employ to read effectively from digital texts?

To answer these questions, we carried out a series of focus groups with undergraduate students at a research-intensive university in the North of England. As Cleary et al. (2014, p.474) point out, focus groups have an advantage over one-to-one interviews as they may create a 'synergistic "sparking-off" between group members', which can help participants with recalling and recounting their experiences. However, focus groups also need careful moderation to ensure that all participants feel comfortable about speaking and that more dominant personalities do not take over (Sim and Waterfield, 2019; Denscombe, 2021).

After we obtained ethical approval from the institution, we carried out six focus groups with 20 undergraduates from across the university (see Table 1). We aimed our recruitment at second and final-year students, as we wanted to hear from students who considered themselves to be experienced academic readers, and in total 16 final-year and four second-year students took part. We recruited students on a first-come-first-served basis, although we acknowledge that this recruitment strategy may have led to an over-representation of engaged students who are not representative of all their peers (Fletcher, 2019). The participants were a mix of nationalities, and four of the students in the study were non-native speakers of English. Although some students voluntarily spoke about their lives outside of university, we did not collect detailed information from participants about their backgrounds. However, it would be an interesting avenue for future research to explore whether students' particular circumstances had a bearing on their reading practices.

Table 1. Disciplinary area of focus group participants.

Participant (P) number	Focus group	Disciplinary Area	Year of study
P1	1	Marketing	4
P2	1	Marketing	3
P3	1	Marketing	3
P4	2	Human Geography	3
P5	2	Biomedical and Life Sciences	3
P6	2	Fine Art and Creative Writing	3
P7	2	Geography	3
P8	3	French Studies and Linguistics	4
P9	3	Politics, Philosophy and Religion	3
P10	3	French Studies and Linguistics	4
P11	3	History and English Literature	3
P12	4	Marketing	3
P13	4	English Literature and Creative Writing	3
P14	5	Computer Science	2
P15	5	Earth and Environmental Science	3
P16	5	Geography	2
P17	5	Linguistics and English Language	3
P18	6	Natural Sciences	2
P19	6	Geography	2
P20	6	Geography	3

The focus groups lasted up to one hour and were facilitated by two Learning Developers, with between two and four student participants in each. Despite it being common practice for researchers to moderate their own focus groups (Citizens Advice, 2015), we acknowledge that using university staff as focus group facilitators may have influenced the way that students responded to questions. Our focus groups took place between March and May 2020; one focus group was in person, but due to Covid-19 restrictions, the other five were held online via MS Teams.

Audio recordings of the focus groups were transcribed verbatim by a professional transcriber, and we used thematic analysis to analyse the transcripts (Braun and Clarke, 2006). The analysis procedure started with all project team members reading the transcripts individually, and from this initial read we developed a set of initial codes. Following this, we came together to discuss and finalise the coding framework, and the first author then coded the transcripts. Following this, we came together again to develop the codes into a set of overarching themes (Braun and Clarke, 2006).

Results

For 18 of the 20 focus group participants, digital reading formed the majority of the reading undertaken for their studies. For the remaining two students, the balance was more even. Most of the students had also noticed a general shift as they progressed through their studies, with a reduction in print reading as they moved into the final year of their studies. However, despite the prominence of digital reading, it became clear from the discussions that some aspects of print reading – in particular the scope for more sustained focus, detailed reading and enjoyment of the experience – were highly valued by the students. Despite print reading being preferred in certain circumstances, immediacy of access to digital texts, along with the digital tools that facilitated reading and note taking, often led to this medium being the default choice.

In this section, we present an overview of our findings, structured around the three main themes that emerged from the focus groups: (1) reading purpose and type of text, (2) reading and note-taking, and (3) reading experience.

Reading purpose and type of text

A general trend emerged from the focus groups in terms of reading medium and reading purpose. When researching for assignments and dealing with large numbers of texts, the students tended to find the digital medium the most practical and manageable. Students were more likely to consider reading in print if the text was a core reading, if the purpose required detailed reading (e.g. to develop understanding of key concepts, to critically evaluate an article, to revise for an exam), or if they were reading literary texts for academic purposes. Type of text, therefore, also overlaps with purpose, as students talked more about journal articles in the context of researching and writing assignments (mostly online availability), and textbooks for core readings and developing understanding of key concepts.

Reading for assignments

The students gave several reasons for their tendency towards digital reading when researching and writing assignments. Firstly, they mostly talked about journal articles in this respect, a text-type increasingly less available in print in university libraries. Whilst one participant (P9) did regularly print out articles, the others tended not to, due to the large number of texts involved, along with environmental and financial considerations. Secondly, accessing texts in digital format helped the students to manage the time pressure of assignment deadlines. Immediacy and ease of access was a key advantage, and embedded links helped to speed up the research process. Tools such as the search function, and copy and paste, were also seen as timesaving, contributing to efficient reading and note-taking practices. Finally, the digital format also more generally lent itself better to the research process, as students could more easily interact with several texts at the same time, toggling between tabs. The students had also developed their own systems for storing, collating and retrieving information that fed into their assignment-writing process.

Reading to develop knowledge and understanding

Reading in print was often connected by the students to purposes that required in-depth, detailed reading of individual texts, either in their entirety, or of significant sections. Some students explained that they would be more likely to consider opting for print format when the reading was a core text, when they wanted to keep the text and return to it, or when the text as a whole was short (keeping environmental impact and printing cost to a

minimum). Several students also talked of opting for print when they wanted to learn or remember the information. P12 noted: 'if I was reading to learn something, I would much rather read print because it's easier for me to read that and I can do it wherever I want', whereas for note-taking for essays, she would choose digital because 'it's easier for me to copy and paste some of the fragments'. Similarly, P14 viewed print reading as helping with being able to 'read and to remember information' and P20 preferred print texts for readings that were 'providing a basis for an essay', but digital texts to 'flick through something' to find supplementary information and 'pop it into an essay'.

Textbooks and novels

Two other text types that received specific attention in most of the focus groups were textbooks and novels. Textbooks were discussed in five out of the six focus groups, and students typically expressed a preference for reading them in print. The physicality of hard copies was the main reason for this preference, as it helped students in their navigation of the information. Being able to flick through, jump from one section to another, get an overview from contents and indexes, or get a quick sense of the length of a section or chapter, were all given as reasons for preferring the print medium. Textbooks provide students with a way into a field, and typically have the purpose of 'making established disciplinary knowledge accessible to large sections of uninitiated novice readers' (Bhatia, 2006, p.31). To achieve this purpose, their formats often include such features as chapter aims, examples, visuals, glossaries, summaries, and end-of-chapter exercises (Bhatia, 2006). It may be that navigating such features for the purpose of building and checking understanding is facilitated more through the physicality of a hard copy. However, the students also talked of issues of availability with physical textbooks, and that they would use digital versions if it meant they could access the text more quickly.

Several participants in the focus groups were studying courses that had a literature element – either English Literature, Creative Writing or French Studies – that involved reading novels on a regular basis. It was clear that reading in hard copy was still the norm for this type of text, and strongly preferred by most of the students. Reasons for this ranged from challenges with engaging with narratives digitally, to affordances of the hard copy that facilitated study of the text. One participant (P6) talked about a diary she had tried to read in digital format but ended up buying the print copy instead because she felt that the continuous scrolling made it 'difficult to lose yourself in a story'. This echoes

previous research that showed reading in print to be more immersive, particularly for longer texts (Mangen, 2016; Mangen et al., 2019). The students in our study also explained that interaction with and ownership of hard copy novels was important to them for academic purposes – being able to annotate, take to seminars and read anywhere, were all given as reasons for using hard copies, as was the physicality of the text itself.

Reading and note-taking

Reading and note-taking practices were also influenced by reading medium. One key approach emerging from all focus groups was how students read to assess the relevance of a text for their purpose (usually assignment-writing). In all six focus groups, students used either the term 'skimming' or 'skipping', or both, to express reading activity that involved engaging with only sections or fragments of a text to make an initial judgement about its relevance, or to get a general overview. Students were more likely to take this approach with digital texts because of the number of texts involved; whereas they were more likely to read the whole text if they printed it out. P15 commented that, 'I'm probably more quickly dismissive when I'm doing digital because I do just focus on the abstract and conclusion straightaway, and if I don't like that, I'm not going to read the whole thing'.

Students also incorporated word search functions (commonly ctrl + F) into their digital reading practices. This represented a key difference in how they read digitally compared with print. Fourteen students said they found it useful – crucially it helped make their reading more efficient – whilst only one student (P2) said she did not use it, but instead had words in mind that she scanned the text for as she read. Some students described starting their reading with a key word search to see if the text was relevant, whilst others described getting an overview of the text first before searching for specific information using key terms. P12 noted that one negative consequence of using the search function was that more often than not she ended up reading in a fragmented way.

In terms of annotating and taking notes from texts, students expressed a range of preferences and approaches. Some students expressed a strong preference for annotating hard copies and taking hand-written notes for specific purposes. For them, the more tactile experience of annotating a hard copy led to greater levels of engagement and enjoyment, and handwriting notes facilitated greater retention of the information. For

example, P11 spoke of liking being able to scribble notes over print texts, and touch and interact with them, and P16 highlighted his lack of engagement with notes when typing in contrast to writing. Similar to the experiences of our students, research on note-taking has found that students encode memory more efficiently when handwriting notes as opposed to typing (Crumb et al., 2022).

The students also discussed the affordances of note-taking from digital texts, which included being able to highlight PDFs, add comments to documents, and use the split screen function to have a note-making document open alongside the digital text. The most commonly discussed affordance (spoken about by 11 participants) related to the copy and paste function, which shaped several of the students' approaches to note-taking, in particular for assignments. Some students used this function to add quotes to their own notes on a topic, whilst others read with the purpose of building a bank of quotes that they might want to use in their writing. This sense of mining a text for quotes is reflected in the following comment:

> if I'm reading something and trying to get quotations from it, I'll usually have the online text on one window and the Word document on the other where I'm copying and pasting quotes that I think are relevant, and putting a page reference (P6).

Students noted several advantages of gathering quotes in this way, such as the accurate reconstruction of the quote, the time saved on writing/typing out long quotes, being able to include the link to the source, and being able to use the search function to go back and read the quote in context.

Reading experience

In terms of reading experience, students associated reading in print with more sustained levels of concentration, whilst digital reading presented more distractions and often led to headaches and eyestrain. In addition to distractions related to social media, some students felt that embedded links in academic texts had the potential to take their reading away from its initial focus. P3 described following such links as going 'down a rabbit hole' and had capped the number of additional articles she would access in this way; P19 described

it as a 'research hole'. P13 highlighted online distractions such as Instagram and Facebook, whilst noting that when reading in print, their focus was just on the words on the page. In all six focus groups, either headaches/migraines, eyestrain or both were associated with on-screen reading, and impacted on students' level of focus, ability to sustain reading for longer periods of time, and enjoyment of the experience.

A further reason students gave for the increased focus with print texts was the tactile nature of the medium itself, which they also connected to greater enjoyment of the reading experience, echoing previous research (Baron et al., 2017; Mizrachi et al., 2018). P12 described how the tactile nature of reading in print helped her enjoy the experience more:

> I enjoy more reading the printed form, so because I enjoy it I'm more into it and I have all of my senses and mind focused more on this because I just feel that brings me the joy, and I want to do it more than I want to read online.

A pattern emerged in the focus groups of students enjoying the reading experience itself when working with print texts, but that with digital texts, the enjoyment came instead from the ease and convenience of access and the additional affordances of the technology. For some students, the additional features of digital texts led them to prefer it overall as a medium. For example, P15 found print reading more enjoyable, but also added 'I still prefer digital in terms of practicality'. A similar view was shared by P16:

> I'd say that in terms of enjoyment of the actual reading [. . .] it's nice to have that hard copy book, but what puts me off doing that more is all the other things that digital reading can give you on top of just reading.

Device and familiarity with software/applications that support reading and note-taking also contributed to a positive digital reading experience. Two participants, for example, had bought iPads part way through their studies, and both expressed greater engagement with digital reading as a consequence. This echoes Mizrachi et al.'s (2018) study, which also found that the type of digital device was an important factor in the enjoyment of digital reading. Our literature students also talked in a generally positive way about e-reading devices for reading novels, noting that they may have opted for this had it not been for the advantages of print for studying, such as annotating the text.

Discussion

Our students' views highlight the different affordances of reading in the two mediums for different purposes and text types, and show that reading medium does indeed influence the development of reading practices at university. In particular, the students reported finding print texts facilitated better concentration and enjoyment. This corresponds with the findings of previous studies which found that print texts reduced mind wandering (Clinton, 2019) and that students perceived them as more immersive (Hancock et al., 2016). The students' comments also reflected the view that reading digital texts encouraged more surface-level reading and reported using processes similar to those described by Liu (2005, p.700), such as 'browsing and scanning, keyword spotting, one-time reading, non-linear reading'. In general, our students connected reading in print with more focused reading and greater depth of understanding, whilst digital reading tended to be associated with more selective and fragmented reading, aided and motivated by the search and copy and paste functions, and often with a view to saving time.

Experimental studies of digital reading often suggest an inferiority when compared to print (Delgado et al., 2018; Clinton, 2019; Ben-Yehudah and Eshet-Alkalai, 2021); however, our students described practices specific to digital texts that played an important role in researching for assignments. The digital medium enabled students to efficiently navigate a range of varied and complex texts and make quick decisions about the relevance and importance of a text or section of a text for a specific purpose, drawing connections as they toggled between them. We would argue that whilst the style of reading itself may appear more fragmented and superficial, as part of the academic reading-to-write process, these practices were often underpinned by more complex decisions that demonstrate skill, judgement and criticality. This is supported by Liu (2005), who points out that whilst the digital medium encourages surface reading, at the same time it also facilitates a more selective approach to reading.

When reflecting on their practices in respect of digital reading, the students in our study showed differing degrees of critical reflection – particularly in discussions around their use of copy and paste and keyword search functions. Some students reflected on the impact of their practices on the quality/depth of reading, acknowledging potential negative impacts of reading and note-taking in a fragmented, more de-contextualised way. Other comments

suggested a more pragmatic view of reading in the digital medium, where practices had developed largely with efficiency in mind, again corresponding to associations made in the literature between digital reading and 'speed and multitasking' (Delgado et al., 2018, p.25).

In a similar manner to the students in Hansson and Sjöberg's (2019) study, our students confirmed that, whilst they may have grown up with high levels of exposure to digital media, they still went through a process of developing strategies and techniques for working with digital texts in an academic context. Almost all of the students had developed their practices for studying from digital texts on their own through trial and error, or by talking to peers. The students reflected on how their study strategies had developed as they moved through their degree programmes and talked about 'breakthroughs' or 'life changing' moments when they discovered a new tip or strategy, which largely occurred by chance. Our focus groups specifically recruited students who considered themselves to be 'experienced readers' and so it is likely that there are many students who do not happen upon the tools and tips that make studying from digital texts easier. More research with a wider range of students at different points in their academic journeys would help shed light on the perceptions of students who are not yet at the point of calling themselves 'experienced' digital readers.

Our research has revealed that there is often a gap between students' preferences and their practices in respect of choice of medium. Although print was preferred for certain reading purposes, and often enhanced the reading experience, the students were more likely to access texts digitally. This highlights some of the challenges surrounding the role of choice. Students spoke of constantly working under time pressures, as well as responding to expectations of reading high volumes of sources. Both these curricular components encourage students to use digital reading practices that support immediacy, and which allow them to manage large quantities of reading. Students also had to balance their preference for print against the financial and environmental costs of this medium. Furthermore, some students' comments highlighted the implicit assumptions conveyed through the way readings were made available to them; if the text was provided online as a PDF, then the default was to read it in that form, without considering print as an option. Finally, the purchasing policies of university libraries, which are increasingly supporting digital texts, mean that the impetus or even ability of students to put preference for reading into practice is eroded.

Our study has two key implications for our work as Learning Developers. Firstly, in our work with students, we can more explicitly explore the role of medium in the development of academic reading practices. By drawing attention to the affordances of different media for different purposes and providing space for students to reflect on their own preferences, students may feel more in control of the choices available to them and more able to identify and unpick any default practices they may have developed. Secondly, we can support students with their approach to digital reading through sharing the tools, techniques and strategies identified in our focus groups and wider research, and encouraging critical reflection on the effectiveness of these in the different study contexts they may be used for. We have developed resources to help meet these two aims and to begin to address the relative lack of focus on reading medium in study guides. These resources consist of an interactive online resource that students can work through or dip in and out of, and stand-alone resources that can be used to facilitate discussions in workshops and teaching sessions. The interactive resource is divided into three main sections: (1) Reading purpose, preference and practicalities, (2) Approaches to digital texts and (3) Reading and note-taking. These resources will be made available through the LearnHigher website.

Conclusion

At the outset of this paper, we identified a number of factors that are making it increasingly less feasible for students to consult only print texts in their studies. The efficiencies that digital texts bring for both institutions and students mean that the trend for increased amounts of digital reading for students is unlikely to reverse in the near future. The experiences of students in this study correspond with recent studies (Delgado et al., 2018; Ben-Yehudah and Eshet-Alkalai, 2021) that found print reading promotes a more comprehensive and in-depth quality of reading than reading digitally. Our study has further demonstrated that our students are negotiating a series of complex decisions in relation to the purpose and practice of their reading, which impacts upon their reading experiences.

The insights gained from conversations with students in the focus groups have fed into the resources we have developed. The resources encourage exploration of and critical reflection on reading habits, preferences and practices in both print and digital medium.

We also hope these resources will develop student awareness of skills and tools that will enable effective studying from digital texts and will encourage students to feed back to us with their experience of any new tools and approaches. We hope that this research and the subsequent resources will go some way to addressing the shortfall in development opportunities for enhancing students' strategies for reading and studying from digital texts.

References

Ackerman, R. and Goldsmith, M. (2011) 'Metacognitive regulation of text learning: on screen versus on paper', *Journal of Experimental Psychology: Applied* 17(1), pp.18–32. Available at: https://psycnet.apa.org/doi/10.1037/a0022086 (Accessed: 13 July 2022).

Baker, S., Bangeni, B., Burke R. and Hunma, A. (2019) 'The invisibility of academic reading as social practice and its implications for equity in higher education: a scoping study', *Higher Education Research & Development* 38(1), pp.142–156. Available at: https://doi.org/10.1080/07294360.2018.1540554 (Accessed: 13 July 2022).

Baron, N.S., Calixte, R.M. and Havewala, M. (2017) 'The persistence of print among university students: an exploratory study', *Telematics and Informatics* 34(5), pp.590–604. Available at: https://doi.org/10.1016/j.tele.2016.11.008 (Accessed: 13 July 2022).

Baxter, G., Beard, L., Blake, M., Greenhall, M., Lingstadt, K., Nixon, W.J. and Reimer, T. (2021) 'Covid-19 and the future of the digital shift amongst research libraries: an RLUK perspective in context', *New Review of Academic Librarianship* 27(3), pp.322-348. Available at: https://doi.org/10.1080/13614533.2021.1976232 (Accessed: 13 July 2022).

Ben-Yehudah, G. and Eshet-Alkalai, Y. (2021) 'Print versus digital reading comprehension tests: does the congruency of study and test medium matter?', *British Journal of*

Educational Technology 52(1), pp.426–440. Available at: https://doi.org/10.1111/bjet.13014 (Accessed: 13 July 2022).

Bhatia, V. (2006) *Worlds of written discourse*: *a genre-based view.* London and New York: Continuum.

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology* 3(2) pp.77–101. Available at: https://doi.org/10.1191/1478088706qp063oa (Accessed: 13 July 2022).

Citizens Advice (2015) *How to run focus groups.* Available at: https://www.citizensadvice.org.uk/Global/CitizensAdvice/Equalities/How%20to%20run%20focus%20groups%20guide.pdf (Accessed: 10 March 2022).

Cleary, M., Horsfall, J. and Hayter, M. (2014) 'Data collection and sampling in qualitative research: does size matter?', *Journal of Advanced Nursing* 70(3), pp.473-475. Available at: https://doi.org/10.1111/jan.12163 (Accessed: 13 July 2022).

Clinton, V. (2019) 'Reading from paper compared to screens: a systematic review and meta-analysis', *Journal of Research in Reading* 42(2), pp.288–325. Available at: https://doi.org/10.1111/1467-9817.12269 (Accessed: 13 July 2022).

Cottrell, S. (2019) *The study skills handbook.* 5th edn. Macmillan Study Skills. London: Red Globe Press.

Crumb, R.M., Hildebrandt, R. and Sutton, T.M. (2022) 'The value of handwritten notes: a failure to find state-dependent effects when using a laptop to take notes and complete a quiz', *Teaching of Psychology* 49(1) pp.7-13. Available at: https://doi.org/10.1177%2F0098628320979895 (Accessed: 13 July 2022).

Delgado, P., Vargas, C., Ackerman, R. and Salmerón, L. (2018) 'Don't throw away your printed books: a meta-analysis on the effects of reading media on reading comprehension', *Educational Research Review,* (25) pp.23–38. Available at: https://doi.org/10.1016/j.edurev.2018.09.003 (Accessed: 13 July 2022).

Denscombe, M. (2021) *The good research guide: research methods for small-scale social research projects.* 7th edn. London: Open University Press.

Fletcher, J.R. (2019) 'Negotiating tensions between methodology and procedural ethics', *Journal of Gerontological Social Work,* 62(4), pp.384-391. Available at: https://doi.org/10.1080/01634372.2018.1564718 (Accessed: 13 July 2022).

Flick, U. (2008) *Designing qualitative research.* London: SAGE Publications.

Foasberg, N. (2014) 'Student reading practices in print and electronic media', *College and Research Libraries,* 75(5) pp.705–723. Available at: https://doi.org/10.5860/crl.75.5.705 (Accessed: 13 July 2022).

Hancock, G.M., Schmidt-Daly, T.N., Fanfarelli, J., Wolfe, J.L., and Szalma, J.L. (2016) 'Is e-reader technology killing or kindling the reading experience?', *Ergonomics in Design,* 24(1), pp.25-30. Available at: https://doi.org/10.1177%2F1064804615611269 (Accessed: 13 July 2022).

Hansson, E. and Sjöberg, J. (2019) 'Making use of students' digital habits in higher education: what they already know and what they learn', *Journal of Learning Development in Higher Education,* 14, pp.1–20. Available at: https://doi.org/10.47408/jldhe.v0i14.489 (Accessed: 13 July 2022).

Hardy, A. and McKenzie, C. (2020) 'Meeting students where they are: just in time embedded delivery of information and digital literacy skills', *International Information and Library Review,* 52(1), pp.64-72. Available at: https://doi.org/10.1080/10572317.2019.1710672 (Accessed: 13 July 2022).

Jeong, Y.J. and Gweon, G. (2021) 'Advantages of print reading over screen reading: a comparison of visual patterns, reading performance, and reading attitudes across paper, computers, and tablets', *International Journal of Human-Computer Interaction,* 37(17), pp.1674–1684. Available at: https://doi.org/10.1080/10447318.2021.1908668 (Accessed: 13 July 2022).

Jones, C. and Healing, G. (2010) 'Net generation students: agency and choice and the new technologies', *Journal of Computer Assisted Learning,* 26(5) pp.344–356. Available at: https://doi.org/10.1111/j.1365-2729.2010.00370.x (Accessed: 13 July 2022).

Kong, Y., Seo, Y.S. and Zhai, L. (2018) 'Comparison of reading performance on screen and on paper: a meta-analysis', *Computers and Education,* 123, pp.138–149. https://doi.org/10.1016/j.compedu.2018.05.005 (Accessed: 13 July 2022).

Latini, N., Bråten, I. and Salmerón, L. (2020) 'Does reading medium affect processing and integration of textual and pictorial information? A multimedia eye-tracking study', *Contemporary Educational Psychology,* 62, pp.1-13. Available at: https://doi.org/10.1016/j.cedpsych.2020.101870 (Accessed: 13 July 2022).

Lea, M.R. and Jones, S. (2011) 'Digital literacies in higher education: exploring textual and technological practice', *Studies in Higher Education,* 36(4), pp.377–393. Available at: https://doi.org/10.1080/03075071003664021 (Accessed: 13 July 2022).

Liu, Z. (2005) 'Reading behavior in the digital environment: changes in reading behavior over the past ten years', *Journal of Documentation,* 61(6), pp.700–712. Available at: https://doi.org/10.1108/00220410510632040 (Accessed: 13 July 2022).

Mangen, A. (2016) 'The digitization of literary reading', *Orbis Litterarum,* 71(3) pp.240–262. Available at: https://doi.org/10.1111/oli.12095 (Accessed: 13 July 2022).

Mangen, A., Olivier, G. and Velay, J-L. (2019) 'Comparing comprehension of a long text read in print book and on kindle: Where in the text and when in the story?', *Frontiers in Psychology,* 10. Available at: https://doi.org/10.3389/fpsyg.2019.00038 (Accessed: 13 July 2022).

Mangen, A., Walgermo, B.R. and Brønnick, K. (2013) 'Reading linear texts on paper versus computer screen: effects on reading comprehension', *International Journal*

of Educational Research, 58, pp.61–68. Available at: https://doi.org/10.1016/j.ijer.2012.12.002 (Accessed: 13 July 2022).

Mizrachi, D. (2015) 'Undergraduates' academic reading format preferences and behaviors', *The Journal of Academic Librarianship,* 41(3), pp.301–311. Available at: https://doi.org/10.1016/j.acalib.2015.03.009 (Accessed: 13 July 2022).

Mizrachi, D., Salaz, A.M., Kurbanoglu, S. and Boustany, J. on behalf of the ARFIS Research Group (2018) 'Academic reading format preferences and behaviors among university students worldwide: a comparative survey analysis', *PLOS ONE,* 13(5), pp.1-32. Available at: https://doi.org/10.1371/journal.pone.0197444 (Accessed: 13 July 2022).

Palfrey, J. and Gasser, U. (2008) 'Opening universities in a digital era'*, The New England Journal of Higher Education,* 23(1) p.22. Available at: https://files.eric.ed.gov/fulltext/EJ850701.pdf (Accessed: 13 July 2022).

Prensky, M. (2001) *Digital game-based learning.* New York: McGraw-Hill Publishing.

The Quality Assurance Agency (2021) *Active Online Learning. QAA Collaborative Enhancement Project.* Available at: https://www.qaa.ac.uk/membership/collaborative-enhancement-projects/current-collaborative-enhancement-projects/active-online-reading (Accessed: 10 November 2021).

Reinders, H., Lewis, M. and Phung, L. (2017) *Studying in English: strategies for success in higher education* (Macmillan Study Skills). 2nd edn. London: Red Globe Press.

Schwabe, A., Brandl, L., Boomgaarden, H.G. and Stocker, G. (2021) 'Experiencing literature on the e-reader: the effects of reading narrative texts on screen', *Journal of Research in Reading,* 44(2) pp.319–338. Available at: https://doi.org/10.1111/1467-9817.12337 (Accessed: 13 July 2022).

Sim, J. and Waterfield, J. (2019) 'Focus group methodology: some ethical challenges', *Quality and Quantity,* 53, pp.3003-3022. Available at: https://doi.org/10.1007/s11135-019-00914-5 (Accessed: 13 July 2022).

Van der Gaast, K., Koenders, L., and Post, G. (2019) *Academic skills for interdisciplinary studies.* Amsterdam: Amsterdam University Press.

White, D. and Le Cornu, A. (2011) 'Visitors and residents: a new typology for online engagement', *First Monday* 16:9 – 5. Available at: http://firstmonday.org/ojs/index.php/fm/article/view/3171/3049 (Accessed: 23 February 2021).

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