

TXT 2020: Diving into Digital

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<preface>

## Diving into Digital—Do You Dare to Take the Leap?

The computational advances made in recent decades have catapulted all of us, readers, scholars and researchers alike, into the deep-end of digital text. This new iteration of the written word is undeniably distinct from its paper-bound predecessor. For one, it appears on the sleek, interactive surfaces of electronic screens, which encourage us to engage with entirely new ways of reading. They are also riddled with distraction, and can become treacherous data resources for third parties. Digital text also gave rise to computer code, a textual variation that is, for the first time in history, not exclusively designed for human understanding, but primarily intended to be read by machines. Finally, libraries and archival institutions are now migrating much of our bibliographical heritage to digital platforms, invariably changing our experience of printed or handwritten originals. In a time of such great textual transition, many have taken to the new paradigm of digital text like fish in water, while others remain reluctant to take the leap.

The 2020 issue of *TEXT* hopes to offer its readers some guidance in navigating through these murky waters. 'Diving into Digital' brings together an international group of scholars and experts from the digital humanities, literary and literacy studies, the library sector and the educational profession. Written from a diverse range of perspectives, these articles investigate rapidly changing reading and learning habits, the possible necessity of coding literacy, challenges regarding privacy and data, and our transformed experience of textuality within digital formats. As we increasingly transfer our reading, learning, writing, and researching from the page to the screen, we must consciously engage with the academic, cognitive and social implications of this seismic shift.

The production of a printed hardcopy all about digital text carries with it a certain irony that has not escaped us. However, by removing this issue from the medium of the screen, which is so bound up with our experience of digital text, we hope to place the reader at a helpful distance from the subject of discussion. Despite this issue's cautioning of an over-enthusiastic embrace of the digital, it also emphasises the exciting opportunities that await us at this new frontier of textual communication. In reading the articles contained in this issue, we urge you to take its titular sentiment to heart, and dive into digital with us.

Last but not least, TXT would like to express its deepest gratitude to Brill publishers, all of its contributors, and supervising professor Adriaan van der Weel, not only for making this issue a possibility, but also for making it such a pleasure to read.

*Helena Schöb, on behalf of the TXT 2020 team*

Leiden, April 2020

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## Behind the Screen Looms a New Gutenberg Revolution

*Adriaan van der Weel*

The digital revolution that has been washing over us has been presented as anything from a scourge to a blessing. When it comes to reading, conservatives—such as, famously, Sven Birkerts in *The Gutenberg Elegies*—have tended to regard it as a serious threat to the time-hallowed reading practices that have decisively shaped our civilisation. At the other end of the spectrum, progressive adopters of new technology saw vistas of novel and exciting opportunities for improving the dissemination of human knowledge. The clash between conservatives and progressives continues today, with education as the most prominent battlefield. Here the stakes are immense, not only for students and teachers—and, not to forget, the technology industry—but also for the future of society.

To contribute to a more fact-based debate, about ten years ago Anne Mangen and I laid the foundations for the European E-READ research network. Over the last few years, empirical research—much of it by E-READ members—has been establishing beyond doubt that, as the ‘Stavanger Declaration Concerning the Future of Reading’ puts it, the technology used for reading is ‘not neutral’.<sup>1</sup> When it comes to comprehension, there is incontrovertible evidence of a so-called screen disadvantage, with ‘lower reading comprehension outcomes for digital texts compared to printed texts’.<sup>2</sup>

Scientific research is thus presenting us with ample cause for caution, warranting a conservative attitude towards the implementation of digital technology especially in learning environments. Now, the next challenge will be finding a way to counter this screen disadvantage effect. The necessary first step to that end is to establish beyond reasonable doubt what is actually *causing* it. For the last two dozen years or so the screen reading surface has received the most attention from researchers looking for significant differences between the

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1 Stavanger Declaration Concerning the Future of Reading, <https://ereadcost.eu/wp-content/uploads/2019/01/StavangerDeclaration.pdf> (15 July 2020).

2 P. Delgado, C. Vargas, R. Ackerman and L. Salmerón, ‘Don’t throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’. *Educational Research Review*, 25, 23–38 (2018), p. 34.

paper and screen reading experience, and it is no doubt one contributing factor. However, looking more closely at the research outcomes, I think the decisive impact comes from the elephant in the room: the vast online world that lies behind those screens. I want to argue therefore that when we talk about the issue of using screens for reading, we need to try and distinguish between two inextricably connected yet separate (and separable) things. One is the individual reading experience: the concrete case of one person reading one text on one screen device. This is what empirical research naturally gravitates towards. The other is the more general context: the state of affairs in the modern world in which screen-based devices are inescapably interconnected and part of an all-embracing digital infrastructure.

Making that distinction helps to explain in particular the surprising outcome that today's 'digital natives' are not only not getting any better at reading from screens, but are in fact getting worse at it.<sup>3</sup> '[T]he screen inferiority effect has increased in the past 18 years, and ... there were no differences in media effects between age groups'.<sup>4</sup> That is to say that 'digital natives' suffer more from screen disadvantage in terms of comprehension than their non-digital native peers did two decades ago. In terms of the individual reading experience—the concrete case of one person reading one text on one screen device—this is a counter-intuitive finding. To be sure, several issues have been identified regarding screens in the individual reading experience. It has, for example, been established that scrolling, and even more so hypertext, require additional cognitive resources—a phenomenon that has been called cognitive overhead. Scrolling and hypertext confuse our spatial orientation, in turn affecting memory because of its intimate connection with location. This mental need for things (including information) to have 'a physical address' is more generally connected to our embodied cognition. We may find it harder to cope with screen devices because their haptic affordances do not correspond with the way we experience the material world, also pointing to the role of embodied cognition.

Research is confirming that these are indeed relevant issues when it comes to the comprehension and retention of information read from screens. Yet,

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3 The notion that such a new breed of humans has sprung into being is now widely discounted. See, for example, P. Sorrentino, 'The mystery of the digital natives' existence: Questioning the validity of the Prenskian metaphor', *First Monday* 23:10 (1 Oct. 2018), <https://firstmonday.org/ojs/index.php/fm/article/view/9434>.

4 P. Delgado et al., 'Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension', p. 34.



there was every reason to expect digital natives to be less affected by them and to have become better at reading from screens, not worse, than their analogue counterparts of a generation earlier. After all, the digital native generation not only grew up in a digital world, getting used to scrolling and hypertext from an early age but, in addition, the screens with which they grew up were technically much better in terms of screen resolution, flicker and lighting than they were twenty years ago. Furthermore, digital natives are neither more nor less embodied, nor has the nature of scrolling or hypertext changed. We can only conclude that, on balance, over the last twenty years the conditions of the material substrate for individual screen reading greatly improved. So why did we not only not see an improvement in screen reading performance but even an actual decline?

The paradox can, I think, be explained if, rather than focusing on the individual screen reading experience, we start wondering in what way the digital infrastructure at large may contribute to screen disadvantage. Indeed many suggestions in that direction have been made over the last decade. The best known among them is Nicholas Carr's book *The Shallows* (2010), but Carr is by no means the only one to have suggested that people adopt shallower modes of processing in digital environments.<sup>5</sup> It has been observed, for instance, that readers of digital texts are less likely to bring the same meta-cognitive control processes to their reading as they apply to their paper reading.<sup>6</sup> The poorer quality of attention exhibited in the digital environment compromises the more cognitively demanding comprehension processes involved especially in reading complex long-form texts. In other words, digital readers are inclined to take texts they read on screen less seriously than the ones they read in paper form.

What is alarming here is that '[a]ccording to this perspective, the more people use digital media for these shallow interactions, the less they will be able to use them for challenging tasks. Such arguments are consistent with negative correlations reported between the frequency of digital media use and text comprehension in adolescents (Duncan et al., 2015; Pfof et al., 2013).<sup>7</sup> What makes

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5 See, for example, M. Wolf and M. Barzillai, 'The importance of deep reading', and T. Lauterman and R. Ackerman, 'Overcoming screen inferiority in learning and calibration'. *Computers in Human Behavior*, 35 (2014) pp. 455–463.

6 R. Ackerman and M. Goldsmith, 'Metacognitive regulation of text learning: On screen versus on paper'. *Journal of Experimental Psychology: Applied*, 17 (2011), pp. 18–32.

7 P. Delgado et al., 'Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension', *ibid.*

these findings especially worrying is the very real danger that the 'digital mindset', especially the 'shallower processing style' of reading, is carried over into the realm of paper-based reading.<sup>8</sup>

All this is obviously not to say that the reading substrate mentioned earlier should be discounted as an influence. That some of the factors described have remained constant over the years does not make them any less relevant. However, the fact that they have remained constant while other substrate properties much improved disqualifies them as a cause of the gradual worsening of comprehension. (The digital substrate incidentally also emerges as the culprit in a very different issue: the eye strain caused by reading from small screens, leading to myopia. However, since this is unlikely to affect cognitive performance in reading, we can leave it out of consideration here.) What I am advocating is that if we are looking for significant contributing factors to the steady deterioration of our reading performance, we should focus on the digitalisation of life more generally. It has greater explanatory power than the individual interaction with an individual text on an individual screen.

Pointing the finger at the all-embracing digital infrastructure that has society firmly in its grip is one thing. Proving that a change in reading performance (and reading motivation) is actually *caused* by it is quite another. Differences between individual paper and screen reading performance can be measured under controlled circumstances in a relatively straightforward manner: hence its attraction to empirical researchers. Putative long-term and indirect effects of that mutable assembly of disparate phenomena that I have termed 'the digital infrastructure' are a different case altogether. Yet they are the ones that ultimately define the course of cultural history. Take the effects of the widespread introduction of the printing press in the Early Modern world. If we wished to establish if—and if so, how—the printing press as an 'agent of change' was instrumental in transforming society by enabling the Reformation, the scientific revolution and the Enlightenment, could we do so? Would it be possible to determine its role conclusively?

Of course it is possible to suggest trends and *likely* effects, but how much more than that? The most scholars have been able to agree on is that the printing press was a necessary condition for such massive social effects. For us to be able to recognise the trends and effects, the hindsight afforded by our historical distance is perhaps indispensable. While the difficulties to surmount are huge, only an encompassing investigation of how the printing press's textual

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8 M. Kovač and A. v. d. Weel, 'Reading in a post-textual era'. *First Monday* 23:10 (1 October 2018).

infrastructure gradually managed to penetrate every layer of society can properly bring to light the significance of Gutenberg's invention.

If a group of modern reading researchers could subject a group of Early Modern readers to an eye-tracking experiment, they could hypothesise, for example, that readers would perform slightly better on a printed text than on a handwritten copy of the same text, chiefly owing to the greater regularity of the individual characters. However, even if the results of the experiment confirmed the research hypothesis, and it was found that print positively affected the speed of reading and even comprehension levels, would we not shrug our shoulders and think that these researchers had somehow managed to miss the point of the historical significance of Gutenberg's invention?

Screens are clearly here to stay, and it would be very strange if they did not end up having an effect of at least the magnitude of the printing press. (I would actually wager a bet that their impact will prove far greater than that of the printing press.) Given that the existence of the screen disadvantage has now been established beyond doubt, and given that personal, social, economic and cultural importance is widely attached to reading for the development of such invaluable traits as cognitive patience (concentration, discipline), critical thinking skills and social cognition, researchers cannot afford to stand idly by while reading comprehension and motivation are declining. To be able to respond properly (especially in education) we need to investigate to the best of our abilities what it is exactly in the digital infrastructure and the digital mindset that is affecting our reading (and writing) practices. Gaining knowledge and understanding of a phenomenon are the only hope we have for being able to exert any power over it: influencing developments and mitigating their effects.

So the next step in reading research will be to ask what are the meaningful factors into which that unwieldy and undifferentiated notion of 'the digital infrastructure' may be broken up so their role in causing screen disadvantage may be examined? There are some candidates, covering both substrate and infrastructure issues, whose hypothetical effects could perhaps be tested empirically. To start with the substrate (but forgetting those old bugbears of poor definition and lighting), we could test the role of embodied cognition more consistently. The fact that, compared to paper, screens only cater to our embodied cognition to a limited extent reduces the potential role of hapticity in the way we make meaning out of text. The heft of a book, for example, may correlate with its 'importance' in a way that a screen-based text cannot replicate. Some promising research has already been done on this, but it remains under-researched. Another substrate issue that may be directly or indirectly connected to the embodied cognition issue is that the lack of materiality of

digital texts may lead to a defective sense of 'ownership'. Legally, published digital texts are almost impossible to own in the sense that they can usually only be accessed on the basis of a (temporary) licence agreement. Metaphorically, it is not inconceivable that the resulting tenuousness of the reader's relationship with the text carries over into a wobbly sense of mental ownership of that text.

Now for the real challenge: the digital infrastructure. It may be surmised that screens—especially in the online condition—are associated with distraction caused by the multitude of potential activities competing for attention (especially involving modalities that are less cognitively demanding than reading). Another hypothesis is that screens foster an unrealistic sense of agency and control, contributing to overconfidence. Overconfidence on the part of screen readers has actually been pinpointed in previous research outcomes.<sup>9</sup> The fact that screens are often regarded, both by the digital natives themselves and by their teachers (as well as many media critics) as their natural realm contributes to overconfidence in the digital condition. More and more, educational practice is adapting to the more fragmented, shallower ways in which young people read, thus undercutting discipline and diminishing traditional reading socialisation, which in turn will be less likely to act as a counterweight to skimming and browsing habits.

A further plausible hypothesis is that certain characteristics of digital (vs paper) texts—especially in the online condition—will serve to undermine textual authority. Take for example their ephemeral nature: both their form and content can be readily changed without warning, and they can be here today, gone tomorrow. Moreover, the fact that anyone can publish online and be an 'author' could well be regarded as 'cheapening authorship'. That anyone can publish online, incidentally, is itself the result of the fact that any restraint caused by the need for financial investment—a natural aspect of all paper-based forms of publication—falls away to a large extent. It makes sense to assume that the erosion of textual authority leads to digital texts being taken less seriously than when the same texts are read on paper. Lastly, digital text might suffer from the lack of predictability and reliability of the user interface compared to paper. If every time the hardware and software are updated, users need to familiarise themselves again with the interface, may this not also undercut textual authority?

What I think this list of hypotheses (and more may no doubt be formulated) suggests is that the screen as a reading surface is only the visible tip of an iceberg. The much larger part of the iceberg that remains submerged and

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9 E.g., Lauterman & Ackerman, *op. cit.*; Ackerman & Goldsmith, *op. cit.*

thus invisible is the digital infrastructure to which that screen is always connected. And for all its being invisible, that is where I think we should look for the most salient causes of screen inferiority.

Once we decide to train our sights on the digital infrastructure, we will actually find that it harbours a great many more challenges than screen inferiority that are in urgent need of addressing where reading is concerned. These include such diverse issues as the concept of knowledge, which is changing from product to process (e.g., from just-in-case to just-in-time knowledge); the prevalence of algorithmic modes of accessing information online, which is impairing diversity; the increased reader responsibility demanded by the effective navigation of the digital environment, which is causing a cognitive divide, and thus drives inequality. Like the broader causes of screen inferiority, all of these effects—and many others—deserve to be made visible as part of the cultural transformation triggered by the digital revolution.

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</chapter 1>

## Opening Up the Black Box: An Analysis of the Rationale of Coding Literacy

*Peter Verhaar*

Writing in the third decade of the 21st century, it has almost become a platitude to state that digital technologies have initiated a radical transformation of the way in which scholars engage in research. In the humanities, as in other disciplines, a growing number of researchers are intent on unlocking and enhancing the innovative possibilities associated with computational methods. For humanists, such transformative opportunities are spawned partly by the fact that libraries, archives and museums have collectively digitised millions of cultural and historical artefacts, and partly by the ever-expanding sophistication of the tools and the algorithms with which these digital objects can be analysed. With the rising importance of digital research methods, many scholars have begun to ruminate on the question whether they are actually qualified to do this type of work. Such concerns often stem from the observation that educational programmes in the humanities have traditionally placed very little emphasis on the skills and the capabilities that are required for a productive involvement in digital work. The debate on the nature of the *Bildung* that is appropriate for digital humanists<sup>1</sup> has often concentrated on the question whether scholars need to acquire the ability to work with a programming language.<sup>2</sup> Coding is often seen as a central ‘empowering practice in relation to

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1 D. Berry has discussed the education that is needed in the digital age, using terms borrowed from the German Idealists in D. Berry, ‘The Computational Turn: Thinking about the Digital Humanities’, *Culture Machine*, 12 (2011), 1–22 (p. 7) <https://doi.org/10.1007/s12599-014-0342-4>.

2 During the 2011 MLA convention, for instance, Stephen Ramsay claimed that all digital humanists need to know how to code, and that the digital humanities is fundamentally about “building things”. These statements, made during a panel named “The History and the Future of the Digital Humanities”, unleashed a great wave of acrimonious criticism at the time. The full text of Ramsay’s contribution can be found in S. Ramsay, ‘Who’s In and Who’s Out’, in *Defining Digital Humanities: A Reader*, ed. by M. Terras, J. Nyhan, and E. Vanhoutte (Farnham: Ashgate, 2012). Miriam Posner notes that programming courses are often taught and followed by white males, and argues that the lack of inclusivity in the programming community often deters women and people of colour from learning how to code, see M. Posner, ‘Some Things to Think about before You Exhort Everyone to Code’, 2012 <https://miriamposner.com/blog/some-things-to-think-about-before-you-exhort-everyone-to-code/>. Tanya Clement notes similarly

our highly computational age',<sup>3</sup> and Douglas Rushkoff has famously emphasised that a literacy in coding offers programmers 'access to the control panel of civilization'.<sup>4</sup> Confronted with such exhortations to code, however, many have contended that the learning curve can be very steep for scholars without a background in computing,<sup>5</sup> and that it may not always be necessary for scholars to learn how to program themselves, as it is a task which can be delegated to others.<sup>6</sup> In the face of such obstacles and reservations, however, there is a strong case to be made for the claim that coding literacy needs to be viewed as a critical and indispensable competence for all humanities scholars who aim to make use of computational methods.

Before expounding on the benefits of a proficiency in coding, it is useful to unpack the concept of coding literacy, and to describe the competencies it entails in more detail. At its most basic level, coding literacy implies the ability to read and to write source code, a message expressed using the building blocks of a programming language. Such languages typically consist of components such as if/else structures, loops, variables and functions. A programming language, more particularly, is a constructed language which enables users to formulate a sequence of instructions which can influence the behaviour of a machine.<sup>7</sup> Programming languages can be used, in other words, to imple-

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that there is a system of gate-keeping, emphasising that there is a real debate about "whether or not women and people of color (and others) are precluded from these activities for a variety of very real and very situated reasons". See Tanya Clement, 'An Information Science Question in DH Feminism', *Digital Humanities Quarterly*, 9.2 (2015) <http://www.digitalhumanities.org/dhq/vol/9/2/000186/000186.html>.

- 3 D. Berry and A. Fagerjord, *Digital Humanities: Knowledge and Critique in a Digital Age* (Cambridge: Polity, 2018), p. 51.
- 4 D. Rushkoff, *Program or Be Programmed* (New York: OR Books, 2009), p. 7.
- 5 Franco Moretti explains that when academics learn to code, this "allows them to have a type of intelligence and intuitions that I don't have and will never have. It's an intelligence that takes the form of writing a script, but in the writing of the script there is also the beginning of a concept, very often not expressed as a concept, but that you can see that it was there from the results that the coding produces". See M. Dinsman, 'The Digital in the Humanities: An Interview with Franco Moretti', *Los Angeles Review of Books*, 2016.
- 6 In 2015, O'Sullivan et al. conducted a survey among ninety-six researchers engaged in digital humanities research, to find out whether they considered programming to be a necessary competence. The survey found that the participants, above all, stressed the importance of being able to collaborate. The researchers conclude that "[y]ou do not 'have' to code, as long as you can work—effectively—with someone who does". See J. O'Sullivan, D. Jakacki, and M. Galvin, 'Programming in the Digital Humanities', *Digital Scholarship in the Humanities*, 30 (2015) <https://doi.org/10.1093/llc/fqv042>.
- 7 The BCS Glossary of Computing defines programming languages as "the means of generating the software that makes the computer work. A computer operates by executing a program,



ment algorithms, which can be described, in turn, as unambiguous descriptions of the steps that need to be followed to arrive at a specific result. On the basis of these characteristics, we can classify languages such as Python, Java, Perl, C++ and Ruby as programming languages, and we distinguish these, for instance, from techniques which primarily function as data structures, such as XML or JSON.<sup>8</sup> As textual writing systems, constructed to convey messages, programming languages make use of specific terms and symbols and of well-defined syntactic rules which stipulate how these words and symbols can be combined. Because the instructions that need to be formulated have to follow an exact logic, the process of becoming fluent in a programming language has often been experienced as challenging. Viewed from another angle, however, the directness of the semantics and the restraints that have been built into the syntax of such languages also render the task of reading and interpreting code more perfunctory than the task of interpreting texts in human languages. As human beings have mastered natural languages as part of their upbringing, they sometimes underestimate the complexities of this particular communicative system. Natural languages are generally full of inconsistencies and ambiguities, and, as literary critics are keen on demonstrating, they often have different layers of meaning. Statements expressed in source code are fully devoid of ambiguity, and they only have a single layer of meaning. The way in which the statements are interpreted by the machine does not depend on the time of the day, nor on the mood of the programmer.

Next to becoming adept at working with the vocabulary and the syntax of a programming language, novice learners also need to become acquainted with the communities of practice that have emerged around the technology. Over the course of the history of a language, programmers have generally developed particular communal values, resulting in specific styles or cultures of programming. While the formal syntactic rules of the language determine whether or not the code can be executed, these additional stylistic guidelines mostly help to enhance the legibility or the elegance of the code. The standards for such

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that is, following a sequence of instructions. This is held in memory as electronic patterns, known as machine code. The programmer starts with a design of what the program or algorithm is intended to do, then writes it in a programming language. The written program is known as the source code and is translated into object code (or machine code)". See *BCS Glossary of Computing*, ed. by Arnold Burdett, 14th edition (Boston: Credo Reference, 2017), p. 236.

8 The survey conducted by O'Sullivan et al. in 2015 found that there was considerable disagreement as to what constitutes programming. When questioned whether programming actually formed an integral part of their daily activities, a number of respondents had indicated that they were frequent users of mark-up languages such as HTML and XML, while others referred to languages such as Python.

'extra-functional' properties<sup>9</sup> are determined within a social context. Communities of users may have developed naming conventions for variables and functions, they may endorse specific development tools or coding libraries, and they can propagate certain design principles. Within the community of Python developers, the values which all programmers ought to aspire to have been codified explicitly in a manifesto entitled *The Zen of Python*. Its text consists of a collection of aphorisms which seek to bring home the ideas, among others, that '[s]imple is better than complex' and that, '[i]f the implementation is hard to explain, it's a bad idea'.<sup>10</sup> Code which fully conforms to guidelines such as these are referred to as 'Pythonic'.<sup>11</sup>

The process of gaining mastery in a specific programming language typically runs in parallel with the acquisition of a more generic and a more abstract mode of reasoning which is often referred to as computational thinking. Computer programs are typically created to automate a range of activities or to solve a certain problem, and computational thinking entails the capacity to analyse these types of challenges, in such a way that the solution can be implemented on a computer. It implies the ability to reproduce the various heuristic activities that need to be completed using the core components of a programming language. Compared to coding literacy, which essentially denotes a mastery of one or more concrete programming languages, computational thinking operates at a higher level of abstraction. Various authors have stressed that computation thinking as a term is in fact a hypernym which comprises a range of other, more specific capabilities.<sup>12</sup> Chief among these are decomposition, abstraction and automation. Decomposition, firstly, refers to the ability to divide a large and complicated problem into smaller parts which can be addressed more easily in isolation. This cognitive capacity helps programmers to identify the steps needed to perform an activity algorithmically. A second crucial ability is abstraction, which, according to Jeanette Wing, entails the ability to decide

9 The use of the adjective "extra-functional" was inspired by Mark Marino's discussion of the aims of the field of Critical Code Studies (CCS). Marino explains that CCS aims to interpret "the extra-functional significance of code", "extra" here meaning "emerging from" rather than "outside" or "beyond". See M.C. Marino, 'Why We Must Read the Code: The Science Wars, Episode IV', in *Debates in the Digital Humanities*, ed. by M. Gold and L. Klein (Minneapolis: University of Minnesota Press, 2016).

10 T. Peters, 'The Zen of Python', 2004. The manifesto is shipped with each installation of Python, and can be invoked by typing in the command "import this".

11 K. Reitz and T. Schlusser, 'The Hitchhiker's Guide to Python', 2016.

12 J. Wing, 'Computational Thinking and Thinking about Computing', *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 366.1881 (2008), 3717–3725 <https://doi.org/10.1098/rsta.2008.0118>.

‘what details we need to highlight and what details we can ignore’.<sup>13</sup> During the analysis of specific problems, it is often necessary to conceive of actions or functions in abstract terms, and in ways that conceal the intricacies of their concrete implementation. Besides abstraction and decomposition, Berry and Fagerjord also argue that computational thinking demands a capacity to automate specific tasks.<sup>14</sup> It entails the transformation of existing activities into self-contained processes which can be executed repeatedly and without any human intelligence. While coding literacy and computational thinking are distinct concepts, the former capability is both a prerequisite for and a resultant of the latter set of skills. A basic aptitude for computational thinking is needed to learn how to program, and the ability to think computationally can subsequently improve as a consequence of having programmed. Coding literacy can be described, in short, as the ability to express certain ideas using the symbols and the syntax of a programming language, while being aware of the etiquettes that govern the intelligibility and the readability of the code. Programmers tend to become more fluent and more confident in the use of a programming language as they develop their computational thinking.

The ability to read and to write code is of crucial importance, first and foremost, for digital humanists aiming to adhere to a scholarly ethos which posits that academic work must be transparent and reproducible. Such transparency can be difficult to attain for scholars who are illiterate in coding, since they will need to perform most or all of their computational analyses using applications which have been built by others, and which typically present their functionalities through a graphical user interface. Admittedly, such tools can be very helpful for researchers who want to get a quick impression of possibilities. While these applications usually demand little technical knowledge beyond basic computational skills, such as installing software, uploading files, or selecting options from menus, they still permit their users to carry out a number of basic tasks in the field of data acquisition or data processing. In a sense, such tools exemplify the notion that all computational work is based on abstraction. They present a number of prototypical scholarly activities in a highly simplified manner. This heightened level of abstraction evidently comes with a number of disadvantages. User-friendly software applications typically allow their users to perform a limited number of tasks only. Although the nature of particular tasks can often be manipulated by setting certain parameters, it is generally difficult to surpass the functionalities that have been made available by the

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13 Wing, ‘Computational Thinking and Thinking about Computing’, p. 3718.

14 Berry and Fagerjord, p. 43.

builders of these tools, thus limiting the possibilities for innovative forms of research. More importantly, when activities are mediated through a graphical user interface, the details of the algorithms that underlie the tool remain opaque. Such interfaces obfuscate many of the decisions that were made by the tools' developers. Applications that enable researchers to perform basic tasks in the field of Text & Data Mining, for instance, often conceal the minutiae of how full texts are cleaned, tokenised and enriched. Scholars may use the results of such tools in support of interpretative analysis, even when they fail to oversee the full implications of their own methodology. Websites which allow their users to search in a repository containing collections of digital objects often fail to supply explicit documentation about the completeness or the accuracy of the metadata in the system, and, as a consequence of this, the results that are shown to their users may occasionally be misleading. Decisions that are taken by software developers often impact the result of these scholarly tools directly, and, if scholars are unaware of such decisions, this may evidently compromise their accountability.

The stance that coding literacy is an inescapable necessity is often countered by the argument that coding is an activity which can be delegated to other human beings. The digital humanities have often been portrayed as a 'big tent' or as a 'market place' in which computer scientists and humanists work on data and on tools in a collaborative manner.<sup>15</sup> Within such conglomerates of skills and capacities, there is typically a distinction between scholars who can formulate certain needs on the one hand, and technical experts who can develop the software which can satisfy those needs on the other. As the frames of reference of the two groups may differ, some of the details of such specifications may get lost during the communication of these needs. It may not always be possible, furthermore, to spell out all the requirements in full detail beforehand. Especially during the exploratory phase of projects, scholarly research is often aleatory and unpredictable. Approaches that were chosen initially need to be revisited frequently or be adapted at a later stage, based on intermediate findings. Such experiments can evidently run more effectively and more productively when humanities scholars are versed at coding themselves, and when they can reduce their reliance on others. When they do collaborate, a literacy in coding can still be conducive, as it helps scholars to formulate better specifications. Researchers who have gotten their hands dirty themselves are usually good at estimating whether their requests to other programmers are realistic.

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15 P. Svensson, 'Beyond the Big Tent', in *Debates in the Digital Humanities*, ed. by M. Gold and L. Klein (Minneapolis: University of Minnesota Press, 2012).

Coding literacy matters to humanities scholars, moreover, because of the fact that a growing number of authors and artists have begun to use code as a means of artistic expression. To create the novel *1 the Road*, for instance, the author Ross Goodwin drove from New York City to New Orleans in a car equipped with various sensors. The data that were captured by these sensors were converted into words by a range of machine learning algorithms, and the prose that was generated in this way was published in an unedited form.<sup>16</sup> The Dutch author Ronald Giphart made use of a similar technology to write a new chapter for a Dutch translation of Isaac Asimov's novel *I Robot* in 2017. The chapter was written in collaboration with an application named Asibot, which utilised a neural network trained on several thousands of existing novels to finish incomplete sentences typed in by the author.<sup>17</sup> Experiments such as these pose pertinent questions about the nature of creativity and authorial authenticity. A number of literary authors have also used code to generate or co-create poetry. To produce the volume *Encomials: Sonnets from Pentametron*, Ranjit Bhatnagar developed an application named the Pentametron which carried out large-scale analyses of messages posted on Twitter, and which randomly combined fourteen rhyming tweets which, according to the data science algorithms, consisted of iambic pentameters.<sup>18</sup> A number of poets have felt inspired, furthermore, by the syntax of source code. Code poetry is a genre of poetry written in a programming language. The genre includes texts which contain poetic techniques such as metaphors, imagery, rhyme and rhythm, but which, despite these aesthetic qualities, can still be executed on a computer.<sup>19</sup> For scholars fully lacking an understanding of the techniques used by these authors, it can be difficult to engage in a critical debate about the merits, the relevance and the meaning of such works of art. The task of developing a literacy in coding may also be viewed as a continuation of a longer tradition within the humanities. To be able to analyse cultural or historical artefacts well, scholars have always had to develop a level of expertise in the techniques and the materials used by their makers. Codicologists studying medieval manuscripts need to develop a knowledge of ink, parchment and book bindings, and scholars in the field of photographic studies need to acquire a thorough understanding of

16 R. Goodwin, K. McDowell, and Google (Firm), *1 the Road* ([Paris]: Jean Boite Éditions, 2018).

17 I. Asimov, R. Giphart, and L.H. Zelders, *Ik, Robot* ([Amsterdam]: Stichting Collectieve Propaganda van het Nederlandse Boek, 2017).

18 R. Bhatnagar, *Encomials: Sonnets from Pentametron* (Denver Colorado: Counterpath, 2018).

19 D. Berry, *The Philosophy of Software: Code and Mediation in the Digital Age* (Basingstoke: Palgrave Macmillan, 2011), p. 30.

graphic techniques and of the intricacies of photo-mechanical reproduction. By the same token, it seems reasonable to assume that scholars interested in today's literary avant-garde will need to become familiar with the technologies underlying born-digital phenomena such as Twitter poetry, hypertext novels and algorithmically generated fiction.

Whereas programming has often been portrayed as an exertion which demands a rigidly systematic logic or a strictly mathematical line of reasoning, it is important to emphasise that the process of creating code also demands numerous activities that are decidedly congenial to the type of work humanities scholars have done traditionally. Computational thinking is not necessarily antithetical to humanistic thinking. Humanities research is often interpretative and contemplative. Scholars have been trained to problematise and to criticise certain concepts. They often pride themselves on the ability to approach questions from many different perspectives and on their awareness of the rich historical or cultural context of phenomena. When scholars manage to apply qualities such as these during the composition of a computer program, this can clearly result in software that is robust, reusable and scalable. These humanistic traits can also be fruitful during the development of models, which, as many have noted, forms a central activity in the creation of software tools.<sup>20</sup> Creating code is a 'creative and a generative activity',<sup>21</sup> enabling us to give expression to a conceptualisation of all the relevant phenomena within a well-defined domain. When scholars write code to perform a sentiment analysis of a corpus of texts, for instance, they need to come to grips with the phenomenon of emotionality. They have to recognise the properties that determine the positivity or the negativity of a sentiment, and they need to advance a theory on how such emotions can be evoked by the words in the text. The program that results may be seen as a rendition of the scholar's understanding of the domain. Once such conceptual models have been implemented on a machine, they allow programmers to make inferences, calculations or predictions. If such manipulations lead to errors or to inconsistencies, this allows programmers to identify those areas in which the model still misrepresents reality.<sup>22</sup> Provided that no coding errors have been made, executing a program is, in effect, a scrutiny of the

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- 20 J. Flanders and F. Jannidis, 'Data Modeling', in *A New Companion to Digital Humanities*, 2015 <https://doi.org/10.1002/9781118680605.ch16>; W. McCarty, 'Modeling: A Study in Word and Meaning', in *A Companion to Digital Humanities*, ed. by S. Schreibman, R. Siemens, and J. Unsworth (Blackwell); J. Unsworth, 'What Is Humanities Computing and What Is Not?', in *Defining Digital Humanities: A Reader*, ed. by M. Terras, J. Nyhan, and E. Vanhoutte, 2013.
- 21 M. Kirschenbaum, 'Hello Worlds', *The Chronicle of Higher Education*, 2009.
- 22 W. McCarty, 'The Residue of Uniqueness', *Historical Social Research*, 37.3 (2012), 24–45 <https://doi.org/10.12759/hsr.37.2012.3.24-45>.

theoretical assumptions made during the algorithmic design. The data which are produced as output may prompt programmers to reconsider these assumptions and to reassess the algorithm as implemented. Through such cycles of iterative development, scholars can theorise about a domain, and they can interrogate the full implications of their simulations of this domain, in a manner that demands both logic and inventiveness.

Berry and Fagerjord stress, furthermore, that the act of decomposition, which is a pivotal constituent of computational thinking, cannot be monopolised by computer scientists. Acts of disentanglement and of modularisation are demanded across the full academic spectrum.<sup>23</sup> Decomposition implies the ability to dissect intricate skeins of complexity, next to the ability to reduce these to more manageable proportions. This competence is needed when scholars operationalise their research questions, and when they select the tools and the techniques they will work with during the design of their methodology. As the decomposition that is needed to carry out academic research bears a strong resemblance to the type of decomposition that undergirds computer code, it may be argued that all of scholarship is algorithmic, to varying degrees.

Since digital research methods often imply quantitative research methods, the practical involvement in the development of scholarly software also forces researchers to gain a familiarity with the mathematics and statistics that inform particular analyses. Jeanette Wing stresses that, because computer science has its roots in mathematics, all computational work invariably demands a degree of mathematical thinking.<sup>24</sup> Researchers aiming to investigate properties of texts stored in large digital libraries inevitably face the need, at some point, to become acquainted with the formulae that have been developed by statisticians and mathematicians for calculating similarities, normalising data or establishing correlations. At the same time, there are also limits to the amount and the level of knowledge that can be amassed by humanists in this context. The algorithms that are adopted within digital humanities research generally capitalise on the results of several decades of advanced research in fields such as artificial intelligence, statistical learning and data science. The algorithms that have been developed to create word embeddings or topic models, for instance, are based on sophisticated mathematical formulae, which are likely to perplex or to intimidate large groups of humanities scholars. Responding to the perceived complexity of many of today's statistical analyses, Benjamin Schmidt makes a useful distinction between algorithms on the one hand and

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23 Berry and Fagerjord, p. 47.

24 J. Wing, 'Computational Thinking', *Communications of the ACM*, 49:3 (2006), p. 35.

their transformations on the other.<sup>25</sup> Schmidt stresses that it is not always necessary to be fully cognisant of the intricacies of algorithms, as long as scholars manage to be apprehensive of their outcomes. Foregrounding the transformations that can be effectuated and downsizing the importance of algorithms may be viewed as an exponent of abstraction. In Python, programmers can orchestrate such transformations concretely by importing libraries such as scikit-learn or tensorflow.<sup>26</sup> Using such existing libraries, scholars can work with neural networks and with machine learning techniques without having to delve into the nuts and bolts of all the relevant algorithms. Arguably, the type of expertise that digital humanists need to develop in this area also differs from the level of the knowledge that is required of mathematicians. Digital humanists do not conduct research on formulae and algorithms themselves. The focus is predominantly on whether these algorithms can be used to open up new perspectives on literature and culture. Following the viewpoint that digital humanities research concentrates on applied mathematics, a general comprehension of what algorithms accomplish is sufficient. Such an awareness of the underlying mathematics helps researchers, nevertheless, to take responsibility for their scholarly work.

In her article 'Understanding Computer Programming as a Literacy', Anette Vee maintains that the concept of coding literacy should not be considered in isolation from its social and cultural context. She defines the term 'literacy', more generally, as 'a human facility with a symbolic and infrastructural technology—such as a textual writing system—that can be used for creative, communicative and rhetorical purposes'. The adjective 'infrastructural' is an operative term in this definition. Vee emphasises that the concept of literacy 'leverages infrastructural symbolic technologies and is necessary for everyday life'. Applying this strict definition, and recognising that the ability to code is not an absolute requirement for taking part in society yet, she is reluctant to describe the ability to program as a literacy. She prefers to describe this competence as a 'material intelligence', a term borrowed from Andrea diSessa.<sup>27</sup> It is obvious, nonetheless, that the societal impact of code is expanding almost incessantly, and that software is becoming more and more pervasive within our culture. The ubiquity of code can be illustrated using numerous exam-

25 B. Schmidt, 'Do Digital Humanists Need to Understand Algorithms?', in *Debates in the Digital Humanities* (Minneapolis: University of Minnesota Press, 2016).

26 See <https://scikit-learn.org/stable/> and <https://www.tensorflow.org/>.

27 A. Vee, 'Understanding Computer Programming as a Literacy', *Literacy in Composition Studies*, 1.2 (2013) <http://licsjournal.org/OJS/index.php/LiCS/article/view/24/293>.



ples. Recruiting managers of large companies frequently relegate the task of selecting future employees to artificial intelligence, and, on international stock markets, financial traders increasingly rely on number-crunching software to make decisions on financial transactions. Algorithms determine which information is highlighted on the timelines of our social media, and, as such, they can affect popular thinking and determine the course of democratic elections. Software actively shapes many of today's societal processes, and the logic that is implemented in software can have profound implications for millions of individuals. Many authors have stressed that this is a development which must be scrutinised and criticised,<sup>28</sup> and it seems reasonable to expect that citizens who have obtained a literacy in coding and who have exercised their computational thinking are in a better position to do this. Our tools and our devices are clearly becoming smarter, but this development should not give rise to an increased ignorance on the part of the users of these tools. It is unrealistic to expect that a competence in coding will ever become mandatory for all citizens, but it can be anticipated that the increasing centrality of software will eventually urge growing numbers of people to learn the ropes of programming. While the ability to code was largely confined to computer scientists and IT specialists a number of decades ago, the community of programmers has clearly expanded already, as it now includes journalists, architects, visual artists and humanities scholars as well.

A proficiency in programming, in sum, can be beneficial to digital humanists because of a number of reasons. Scholars who have acquired a literacy in coding are generally able to build customised tools geared directly towards the needs of their own research. Such an active involvement in the construction of scholarly equipment can make the research more transparent and more reproducible. Scholars who have developed a knowledge of programming are well positioned, furthermore, to analyse and criticise innovative works of art which are created or mediated using code. Focusing exclusively on the benefits that may ensue from a competence in the mechanics of programming is much too narrow, however. Coding is a practical form of expertise which can easily become outdated when tools and techniques become obsolete. A literacy in coding is important, principally because it helps researchers to foster their mathematical and computational thinking. A competence in coding ultimately leads to an appreciation of the concepts and the principles that underpin com-

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28 E. Morozov, *The Net Delusion: How Not to Liberate The World* (Penguin Books, 2012); Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (Profile Books, 2019).

putational methods. Humanists who manage to straddle C.P. Snow's two cultures, and who develop their technical prowess, often develop a panoramic perspective which lets them see beyond the concrete tools. The thinking patterns that arise can generally be applied to a wide range of situations, even when the technology gets renewed. Ultimately, they enable scholars to seize new opportunities as they unfold, and to face future challenges that we currently cannot fathom.

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</chapter 2>

# On the Future of Reading in a Data-Driven Culture

*Axel Kuhn*

Digital reading data is collected and used for content selection, reading media design and marketing at a progressive rate. While the economic impact of reading data has already become a prominent topic, social and cultural consequences of a data-driven reading culture have only been discussed rudimentarily. This article will first give insights into digital reading data acquisition and processing and then outline its possible effects on reading culture using a scenario-based approach for further discussion.

## 1 Information, Data, and Reading

The production, distribution and processing of information has become one of the most important social functions in modern society.<sup>1</sup> Information is directly linked to digital networks and media, which have changed its accessibility, utilization and distribution, often in unforeseen ways.<sup>2</sup> Coherently, one of the most controversial discussions has arisen around the handling of personal digital data, which is steadily produced through the use of digital products or services. Some of the recurring issues in this regard are the violation of privacy in social networks like Facebook, the exposure of secret information by whistleblowers, the use of face recognition software in public for prosecution or the utilization of health data by insurance companies. When it comes to media itself, digital data is discussed primarily in regard to its usefulness for personalized content recommendation systems employed for example by Netflix, Amazon or Spotify.

Aside from some individual comments in newspapers, digital reading has hardly been mentioned in this regard.<sup>3</sup> Digital reading data and its potential use is apparently of minor public importance: it is widely seen as non-critical

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1 M. Castells, *Das Informationszeitalter 1: Der Aufstieg der Netzwerkgesellschaft* (Opladen: leske + budrich, 2003); J. van Dijck, *The Network Society* (London: SAGE Publications, 2006).

2 N. Baron, *Words Onscreen: The Fate of Reading in a Digital World* (Oxford: Oxford University Press, 2015).

3 E.g. A. Alter, 'Your E-Book Is Reading You', in: *The Wall Street Journal*, 19 July 2012.

personal information, which at most could serve as useful input when trying to find fitting reading material in a market of overwhelming supply.<sup>4</sup> Not surprisingly, the subtle but impactful change of data significance in the publishing industry for content selection, text creation, media design and marketing has hardly been noticed by the public.<sup>5</sup> This is astonishing because new forms of data acquisition, data processing and data-based decision-making in the publishing industry will likely shape the future of reading far more than digital devices, enriched texts or social reading ever could.

With research in data-driven publishing just beginning to take off, this article outlines the use of digital reading data in publishing houses and how it is acquired.<sup>6</sup> From this, two possible consequences, namely the average and the transparent reader, are envisioned as possible future scenarios of a data-driven reading culture.

## 2 Data, Market Research, and the Publishing Value Chain

A simple definition of data is that it formally represents reality: it describes mundane objects, persons or issues and their specific characteristics by using specific terms or merits. So-called structured data describes reading reality by specifically defined reader attributes like name, gender, age, education, income etc., or by reading attributes like the number of pages read, time spent reading, or place used etc. Structured data is measured by previously defined values, e.g. as defined gender, age cohorts, level of education or simple numbers. It is usually compiled in small units for quantifying, database saving or automated processing and can be easily sorted, allocated or related to each other. Unstructured data, on the other hand, describes objects, persons or issues using rather vague attributes with non-distinctive values like attitudes, preferences or needs. Such attributes do not allow previously defined values, as the basic understanding of these terms differs widely. Unstructured data is usually avail-

4 A. Acquisti, 'The Economics and Behavioral Economics of Privacy', in J. Lane et al. (eds.), *Privacy, Big Data, and the Public Good: Frameworks for Engagement* (New York: Cambridge University Press, 2014), p. 79; and D. Pleimling, 'Social Reading—Lesen im digitalen Zeitalter', in *Aus Politik und Zeitgeschichte*, pp. 41–42 (2012).

5 R.R. Dholakia, N. Dholakia, 'Data Mining and Marketing', in R. Mansell; P.H. Ang (eds.), *The International Encyclopedia of Digital Communication and Society*. Volume 1: A–K (Malden; Oxford: John Wiley & Sons 2015), p. 129.

6 J. Fahsel, S. Hagenhoff, E.F. Heinold, *Publishing 4.0—Chancen, Anforderungen, Konzepte: Denkzeug 2017: Cross-, Hybrid-Media und Digital Content-Services* (Erlangen, 2017), p. 50.

able as textual statements recorded in documents, e.g. in the form of annotations, reviews or self-reported reading experiences.

Data is usually employed by companies to synchronize customer expectations, product design and services, thereby harmonizing supply and demand. Knowledge about actual and potential customer needs is especially important for publishing houses, because reading material is an 'experience good', which means its value cannot be estimated in advance, putting publishing products at a high risk of inadequately meeting customer expectations and creating an unsatisfying reading experience. In order to minimize this, publishing companies usually rely on market research about readers' preferences and habits. Traditional market research is based primarily on empirical collection of structured data, e.g. on sales figures, reader surveys or monitoring customer behavior in bookstores. By differentiating gender, income, education, age etc., specific reading audiences or reading milieus can be constructed, which allows for assessments like 'Middle aged female readers enjoy reading books like *Shades of Grey*' or 'Male adolescents are not reading to a large scale'. Unstructured data is rarely used for mapping complex reading practices or experiences, as it requires challenging and time-consuming analyses of semantic documents. Usually, they are rejected as inefficient, slow and cost-intensive, even though they would provide more detailed information.

At the same time, data in the publishing industry is important as content for publishing products and customer communication. Here, content is defined as processed data arising from editing, compiling, bundling, producing and distributing written text, advertisements, illustrations, pictures, and information into books, magazines, newspapers or other reading material. Processing data entails the transfer of acquired, created or processed data by humans within hierarchical and linear structures. The market's supply of reading material is therefore dependent on the subjective intuition of lectors, editors, designers and marketing experts, underpinned by sales figures and empirical market research.

### 3 Digital Data Acquisition and Processing

The traditional concept of publishing is being transformed by digital technologies: subjective market evaluations, predictions of content trends or chances for success of single products are now increasingly being replaced by algorithms which analyze digital reading data, thereby changing the publishing value chain altogether.

### 3.1 *Big Data and Reader Analytics*

The groundwork for the publishing transformation was laid by the emergence of 'big data'. An umbrella term for a modified handling of digital data, it promises a significant improvement in decision-making in areas of both public and private concern.<sup>7</sup> By using digital devices, digital products, webshops, communities, social media, eBooks, reading apps etc., digital reading data expands exponentially, creating big structured and unstructured digital data sets on readers, reading audiences, reading practices and other activities associated with reading. These data sets are not only ever-growing (via automated background recordings in digital media, for instance), but are also interrelated with typical reading paths, which are updated in real-time. They can also easily be linked to digital data sets from companies, social networks, websites or other digital media. Progressing digitization has multiplied the kinds of reading data that can be made available and is steadily outperforming traditional empirical market research.

Big data as a concept also includes new methods of evaluating large data sets by using advances in artificial intelligence. Specialized algorithms collect, link and interpret reading data automatically and in real-time. Even though only weak artificial intelligence has been used up until now, these rule-based self-learning systems can reliably and quickly identify consistent patterns and logical dependencies in big data sets. Additionally, they can deduce likely actions by readers from these patterns and improve their predictions steadily by integrating new data. Automated data processing can be focused on different objectives, e.g. finding similarities in reading attitudes of readers, extracting analogous preferences for reading material or predicting the most likely search behaviors.<sup>8</sup> This combination of big data and artificial intelligence is promising not only for solving problems in coordinating customer needs and text supply, but also for identifying these problems in the first place.<sup>9</sup>

The most prominent user of big data analysis in the publishing industry is Amazon and its recommendation system. Right from its inception, Amazon collected data from their customers, such as their purchases, their paths from different products to buying decisions and the length of their stay at every sin-

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7 S. Baroncas, H. Nissenbaum, 'Big Data's End Run around Anonymity and Consent', in J. Lane et al. (eds.), *Privacy, Big Data, and the Public Good: Frameworks for Engagement* (New York: Cambridge University Press, 2014), p. 44.

8 C. Cordon et al., *Strategy is Digital: How Companies Can Use Big Data in the Value Chain* (Switzerland: Springer International Publishing, 2016), p. 14.

9 R. Kitchin, 'Big Data—Hype or Revolution?' in: L. Sloan, A. Quan-Haase (eds.), *Social Media Research Methods* (London et al.: SAGE Publications, 2017), p. 30.

gle product page. In the beginning, this data was evaluated by using random samples, and interpreted manually by employees, who then generated recommendations for individual customers. As this was becoming increasingly inefficient with a growing customer base, in-house software for data-analysis was developed, which could detect similarities between customers more rapidly. Eventually, the software became more successful than the employees themselves had been. Nowadays, data acquisition and processing are taking place in real-time when a customer visits the website. Existing customer data, relational data for other customers as well as actual user contexts like cultural surroundings, season, weather, daytime, and the device used are all considered. By Amazon's own account, the recommendations made to customers using data correlations are responsible for the main share of Amazon's turnover.

However, the initial euphoria in the publishing industry in the wake of Amazon's success vanished quickly. Most publishing companies and bookshops have only limited access to customer data because of how the traditional publishing industry structure is divided into publisher, intermediary and retail.<sup>10</sup> Additionally, as most companies are small- or medium-sized, big data sets cannot be generated by themselves. This is why, for ordinary publishing companies, the concept of reader analytics, which is offered by specialized service providers, proves more promising.

Reader analytics combine big data analyses with data from restricted reading tests of individual reading material, collecting information about real reading habits with regards to eBooks or software applications. Additional software tracks the reading of eBooks similarly to how websites track the use of certain tools. The kind of data that is recorded includes, for example, if and when an eBook was opened or closed, at which positions reading stopped, which parts of the text were ignored entirely, how fast or how long parts of the text are read, how long reading the entire text took, which devices were used, and even the geographical location of the reader. This recorded structured data is complemented by a semantic analysis of unstructured data like text markers, annotations, assessments and feedback regarding the text.

The aggregation of general reading data and test data enables statements about the percentage of readers who finish reading the entire text or individual chapters, about the necessary reading time and its variations for different reading audiences, and an overall evaluation of the text, chapters, language, emotional effects etc. Using algorithms, common reading patterns are revealed,

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10 G. Fetzer, 'Buchhandel', in U. Rautenberg (ed.): *Reclams Sachlexikon des Buches. Von der Handschrift zum E-Book* (Stuttgart: Reclam, 2015), p. 77.



and then interpreted as signs of readerly convenience, satisfaction, approval, enjoyment or lack thereof. The first and most well-known service provider which offers reader analytics in the publishing industry is *Jellybooks*.<sup>11</sup> Founded as an eBook-platform in 2011, the company has been concentrating on acquiring and analyzing reading data for publishing houses since 2015. *Jellybooks* uses big data sets from Amazon as well as data from several other eBook providers, combining them with self-generated data from selected test readers. Using confidential algorithms, the likelihood of success of certain eBooks is calculated, their most suitable target audience is determined, and their most probable use cases and reading experiences are predicted.

### 3.2 *Databased Publishing*

The exponential increase of digital content and reading data and its improved processing by enhanced algorithms is changing the way to assess the odds of success and is further transforming the whole publishing value chain. Value chains are defined as modular constructed, interrelated activities in companies, which map the whole process of production and distribution in order to create a value for customers.<sup>12</sup> The added value made by publishing companies traditionally consists of acquisition, production, packaging and distribution of content.

As was the case with the digital transformation of manufacturing by the internet of things, the traditional publishing value chain is also experiencing a transformation. The key concept here is 'databased' publishing, which establishes principles of automatized production by linking units for publishing goods and services.<sup>13</sup> Its added value lies in optimizing product- and service-lifecycles by using digital technologies. It can only be realized with standardized digital resources and processes, enabling automated routines through self-monitoring systems. This means that generating, collecting, connecting and utilizing digital data becomes crucial for publishing success.<sup>14</sup> Former manual working processes are fundamentally altered by these systems, which partially automate the selection of texts, the editing of texts, the bundling of content, the design of reading media and the marketing of publishing products.

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11 See <https://www.jellybooks.com/> (10 March 2020).

12 T. Hess, T.M. Wagner, 'Digitization of the Book Industry,' in R. Mansell, P.H. Ang (eds.): *The International Encyclopedia of Digital Communication and Society. Volume 1: A-K* (Malden, Oxford: John Wiley & Sons, 2015), p. 147.

13 For basic information J. Fahsel, S. Hagenhoff, E.F. Heinold, *Publishing 4.0*.

14 R.R. Dholakia, N. Dholakia, 'Data Mining and Marketing', p. 129.

The impact of this transformation can be shown by using a simple example: in a publishing house, a short advertising text for a title is written and registered in a database. It is then automatically transferred and processed by an integrated digital publishing system. Marketing employees, who are working on an advertising campaign, not only receive the advertising text immediately, but the digital system also automatically suggests the most important catch phrases and target audiences for this title. When designing the book cover, the system automatically shows the text, alongside a short review of a blurb draft. By using semantic analysis, it also instantly suggests fitting cover motifs. The advertising text is immediately compared with existing customer profiles and then sent automatically to selected customers in the form of personalized newsletters.

Connecting numerous available data points, standardized processes and integrated digital systems creates more efficient and custom-fit publishing products and services. Additionally, customer communication can become more personalized and suited to their needs and preferences. Finally, by treating content like data and vice versa, reading media itself become customizable for specific readers, as different texts, text compilations and text formats can be presented automatically.

## 4 Consequences

Acquiring, processing and utilizing digital reading data is primarily discussed and realized in economic contexts. Social and cultural implications of data-based publishing and publishing decisions have yet to be examined in more detail. Subsequently, two fields of potential consequences for reading culture are outlined as discursive scenarios: first, the growing automation and standardization of text production for reading and, second, the loss of reading control and its possible challenges for reading identities.

### 4.1 *The Average Reader and the Standardization of Texts*

One prediction for the increasing utilization of digital reading data is that the average reader—more than ever before—will become the blueprint for text and reading media production, leading to more standardized methods of storytelling, text composition and reading media design. More reading data could bring about the increased and perhaps excessive adaption of texts to average reading behaviors and most probable reading needs, only catering to an anonymous mass of readers. This may initially appear as an improvement for both the publishing industry and the reader, because it increases the probability

of matching text supply to reader needs, and also reduces monetary and time costs for both.<sup>15</sup>

However, this way of thinking would also be very risky. Purely economic perspectives tend to work from the assumption of the *homo economicus*. In this case, readers would have to be thoroughly rational customers who are totally aware of their own desires, acting in complete accordance with them, and consciously organizing their reading practices. But this conception of media use has already been widely debunked by research. Instead, reading practices and their effects are actively constructed through rapidly changing desires, arbitrary emotional responses to text stimuli, often connected to memories, and dynamically transforming reading activities. Reading has therefore been verified to be an especially individual and unique experience, which can hardly be stereotyped, predicted or reduced to an average.<sup>16</sup> More importantly, irrational elements of reading still cannot be identified and assigned correctly by algorithms when collecting data.<sup>17</sup> A scenario in which reading material is reduced down to stereotyped text patterns may probably lead to consumers abandoning reading altogether, because literary breaks, standard deviations and surprising elements are missed, despite these often being essential to satisfying reading experiences.

Symptomatic for this possible development is the ongoing discussion in the publishing industry about fully automated text creation by artificial intelligence using modular data sets. Although complex creative tasks still cannot be replaced, artificial intelligence is already used as an influential supplementary system for world wide web searches, proposing relevant topics, and compiling rudimentary content for further human processing. While automated text creation based on digital data is still not working for fictional texts, it is already used successfully for highly standardized non-fictional texts. *Axel Springer*, for example, first started projects of automated text creation in 2015, and since 2017 it is used in restricted editorial areas, especially for weather forecasts, sports results or financial news.

Another important discussion regarding this scenario surrounds the utilization of reading data as a tool for quality-controlling texts, an idea which is especially polarizing amongst writers and authors. Digital reading data is appreci-

15 A. Acquisti, 'The Economics and Behavioral Economics of Privacy', p. 79.

16 For a summary, see A. Kuhn, S. Rühr, 'Stand der modernen Lese- und Leserbeforschung—eine kritische Analyse', in U. Rautenberg (ed.), *Buchwissenschaft in Deutschland: Ein Handbuch 1: Theorie und Forschung* (Berlin, New York: de Gruyter 2010), pp. 544–546.

17 R. Kitchin, 'Big Data—Hype or Revolution?', p. 34.

ated, on the one hand, for improving storytelling and language, and therefore for becoming more successful on the market. On the other hand, it is feared that publishing companies may use reading data to interfere with writing and restrict creative liberties in the future. Databased average standards for readerly expectations and reactions have the potential to drastically tilt the power dynamic between writers and publishers in favor of the latter. Francine Prose already gave a rather exaggerated example in the *New York Review of Books*, imagining what the future of writers will be like when reading data becomes the basis for negotiations: “writers and their editors could soon be facing meetings in which the marketing department informs them that 82 percent of readers lost interest in their memoir on page 272. And if they want to be published in the future, whatever happens on that page should never be repeated.”<sup>18</sup>

#### 4.2 *The Transparent Reader and the Loss of Reading Control*

Another prediction regarding the utilization of digital reading data is less related to text and reading media production, and more to reading practices and experiences. Submitting reading data when using digital reading media is difficult to avoid, because digital reading media providers usually render it mandatory in their terms of use. Furthermore, data submission is to some extent necessary for pleasant digital reading experiences, in particular when it concerns individual typographical settings or interactive elements. Moreover, reading devices themselves can hardly be hindered from collecting data because of limited settings for privacy protection. Finally, monopolistic market structures with few providers of digital reading materials restrict the choice to avoid data submission.

To further complicate matters, even active digital media users are not fully aware of their devices' background data submission, or think of this practice as an abstract fact which does not apply to them.<sup>19</sup> In reality, reader anonymity is nullified in digital environments, because digital reading automatically produces data like name, email addresses, credit card numbers, home addresses, or technical specifications of devices, which can all be aggregated to reliably identify readers.<sup>20</sup> Because data submission is improving the access, suitability

18 F. Prose, 'They're Watching You Read', in *The New York Review of Books*, 13 January 2015.

19 D. Kontic, 'Ein Horizont, so weit die Daten reichen: Empfehlungen durch Algorithmen', in *Spiegel Online*, 19 June 2017.

20 V. Mayer-Schönberger, K. Cukier, *Big Data: Die Revolution, die unser Leben verändern wird*, 2nd Ed (München: Redline, 2013). pp. 194–197.

and experience of texts, readers usually do not complain. Nonetheless, reading data sets can still be combined with other data and abused by stakeholders with more nefarious interests.<sup>21</sup>

It has been proven that combining independent digital data sets from diverse contexts reveals private information (like personal attitudes, conditions and habits), to which readers never would have given their consent. Using anonymized reading data combined with other big data sets already makes individual readers identifiable and can be used for determining their lifestyles, relationships, work, sports, travel destinations or everyday activities. This becomes even more concerning when reading data can be used in order to reveal information in critical areas of everyday life like finances, health, employment or personal relationships. The worst-case scenario could be the intentional exploitation of data regarding specific guidebooks, pornographic novels, political magazines, or comics by insurance companies, banks, employers or public authorities.

Subsequently, utilizing digital data has the potential to create feelings of losing control when reading, thereby changing its individual and social functionality. Modern democratic societies depend on reading as a means to independent opinion formation, individual fulfilment, unsurveilled environments, as well as tolerance and individual freedom as basic principles.<sup>22</sup> Steady observation and evaluation during reading may compromise these civic liberties.

Widespread knowledge about reader transparency will obviously change the way textual material is selected, read and experienced. It is already well known that readers feeling observed are more likely to find important information rather than to experience relaxation. They tend to accelerate their reading tempo beyond their reading competencies, positively evaluate statements only when they are deemed socially acceptable, and experience previously non-existent emotions like pride when reading efficiently or shame when reading slowly.<sup>23</sup> Reading as a private space for identity construction, unbiased thoughts, reflection on information and expanding one's own horizon is dis-

21 See H. Nissenbaum, *Privacy in context. Technology, policy, and the integrity of social life* (Stanford, Calif.: Stanford Law Books, 2010), p. 41f.; as well as L. Sloan, A. Quan-Haase, 'A Retrospective on State of the Art Social Media Research Methods: Ethical Decisions, Big-small Data Rivalries and the Spectre of the 6Vs', in L. Sloan; A. Quan-Haase (eds.), *Social Media Research Methods* (London et al.: SAGE Publications 2017), p. 662.

22 U. Saxer, 'Lesen als Problemlösung: Sieben Thesen', in B. Franzmann (ed.), *Auf den Schultern von Gutenberg: Medienökologische Perspektiven der Fernsehgesellschaft* (Berlin, München: Quintessenz Verlag, 1995), p. 16.

23 A. Kuhn, 'Lesen in digitalen Netzwerken', in U. Rautenberg, U. Schneider (eds.), *Lesen. Ein interdisziplinäres Handbuch* (Berlin; Boston: de Gruyter, 2015), pp. 433–435.

turbed by recording reading data, possibly leading to doubts about individual attitudes, opinions and preferences in comparison to socially accepted ones represented by databased averages.<sup>24</sup>

From another perspective, reading data may be part of a shifting relationship between human beings and public authorities, experienced as an increasing power imbalance. Historically, government access to reading data has repeatedly proven to be a great danger to individuals.<sup>25</sup> Monarchs, religions and nations have a long tradition of trying to control which texts are accessible and how they are being read.<sup>26</sup> Possessing or reading specific texts was and still is used as an indication of crimes, false political or religious attitudes, or antisocial behavior. Digital reading data combined with other data, then, could be used to assign political attitudes or to predict probable actions in political or legal contexts, a measure which is already being taken in less democratic nations. An often-cited example is the use of reading data in conjunction with statistical probabilities, leading to political persecution or disadvantages when applying for government benefits.

## 5 The Future of Reading

Predicting the future of ongoing developments and their effects remains complicated and, most of the time, turns out to be wrong to some extent. Outlining scenarios and exaggerating predictions nevertheless are common approaches for estimating the impact of new technologies or changing social and cultural practices, inviting further much-needed discourse in the present. The influence of digital reading data on readers, reading, publishing, politics and social systems therefore continues to be debatable. As today's digital euphoria creates illusions of unlimited technological advancement, some restrictions for a databased reading future must, at the very least, be mentioned.

Although big data sets exist, they are not expanding and cannot be combined without limitations. Digital reading data remains clustered, because of

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24 T. Hagendorff, *Das Ende der Informationskontrolle. Digitale Mediennutzung jenseits von Privatheit und Datenschutz* (Bielefeld: transcript, 2017), p. 8.

25 For examples, see S. Rühr, A. Kuhn (eds.), *Sinn und Unsinn des Lesens. Gegenstände, Darstellungen und Argumente aus Geschichte und Gegenwart* (Göttingen: V&R unipress, 2013).

26 C. Lynch, 'The rise of reading analytics and the emerging calculus of reader privacy in the digital world', in *First Monday*—peer reviewed journal on the internet 22 (2017), issue 4.; as well as E. Schön, 'Geschichte des Lesens', in B. Franzmann et al. (eds.), *Handbuch Lesen* (München: Schneider Hohengehren, 1998), p. 5.

different reading devices, competing service providers and incompatible technical formatting. At the same time, big data sets enable the construction of very specific reader types for associated kinds of digital reading, and do not allow for universally valid statements about all readers. Furthermore, reading applications themselves are influencing data quality and integrity. Their usual conception as platformed access to texts only permits intended use cases and is therefore a priori masking specific and unanticipated reading needs and behavioral patterns.<sup>27</sup>

Digital reading data itself can also be corrupted by not reproducing reality correctly. This manifests itself in recording reading breaks, interrupts, pauses, length or navigation patterns without taking their specific circumstances into account.<sup>28</sup> Does a reader really take that long to read a page or did he or she just forget to turn off his or her device? Did they stop reading because they lost interest or did they simply not have enough time to continue? Evgeny Morozov famously declared that algorithms are superior to humans when predicting probabilities, but that humans are still superior when it comes to creative interpretation and logical justification.<sup>29</sup> Reading data therefore is not always reliable, even more because readers may consciously influence data submission and interpretation. For example, readers may avoid data submission altogether by converting text into protected formats or by dodging digital reading altogether. Text could also be acquired illegally, disguising its data allocation. Finally, automated data acquisition may be consciously manipulated by specific reading behavior.

While it is clear that digital reading data is transforming the publishing industry, reading material and reading experiences, its further development remains ambiguous. For now, algorithms still have not predicted bestsellers reliably, authors have not been influenced by databased rejection of their ideas, and readers have not been arrested because of their reading behavior. It remains to be seen whether the future of reading will ever provoke these kinds of scenarios.

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27 C. Gerlitz, 'Data Point Critique', in M.T. Schäfer, K. van Es (eds.), *The Datafied Society: Studying Culture through Data* (Amsterdam: Amsterdam University Press, 2017), p. 241.

28 E. Nawotka, 'Ebook platforms know what, when and how you read', in *Publishing Perspectives*, 20 January 2015.

29 E. Morozov, 'Opposing the Exceptionalism of the Algorithm', in M.T. Schäfer, K. van Es (eds.), *The Datafied Society: Studying Culture through Data* (Amsterdam: Amsterdam University Press, 2017), pp. 245–248.

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## Immaterial Texts: Hope Mirrlees's *Paris* and the Digital Archive

Anneloek Scholten

In May 1920, the Hogarth Press published Hope Mirrlees' *Paris*, an experimental work of modernist poetry that captures Paris in the spring of 1919.<sup>1</sup> It records a moment in time and space: the work includes advertising slogans, posters, news snippets, and fragments of conversation, and contains references to World War One, the Paris peace conference, and Freud's psychoanalytic theories. Some readers are struck by the "immediacy" of the poem, "as if this moment in history [...] were frozen and preserved as an image of what is now the past."<sup>2</sup> The poem powerfully portrays the material traces of history, continuously describing archaeological findings ("Etruscan vases"), plaques commemorating Parisian writers, and architectural remnants of the city's history as a Roman settlement.<sup>3</sup> In turn, it preserves the present by describing the contemporary cityscape of Paris: its landmarks, street signs, advertisements, and celebrities. Later in her career, Mirrlees writes that "[w]hen poets preserve the present by turning it into poetry, in a sense they too are antiquaries," and *Paris* is rooted in such antiquarianism.<sup>4</sup> Described by Julia Briggs as "modernism's lost masterpiece," *Paris* was initially printed in a limited number of copies, and with time, the work disappeared into the archive, re-emerging decades after Mirrlees' death in 1978.<sup>5</sup> Although Mirrlees finds that poets are not *fully* antiquaries, for "antiquaries alone among mortals can restore the past and preserve the present, *tangibly*—and it is touch that matters most," the material history of

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1 Though ultimately published in May 1920, the poem is (incorrectly) dated 1919 on the cover.

2 N. Enemark, 'Antiquarian Magic: Jane Harrison's Ritual Theory and Hope Mirrlees's Antiquarianism in *Paris*', in: *Modernist Women Writers and Spirituality: A Piercing Darkness*, edited by A. Radford, H. Walton, and E. Anderson (London: Palgrave MacMillan, 2016), p. 116.

3 H. Mirrlees, *Paris: A Poem*. (London: The Hogarth Press, 1920), 3, 18–19, 4, available at <https://www.bl.uk/collection-items/paris-by-hope-mirrlees>.

4 H. Mirrlees, *A Fly in Amber: Being an Extravagant Biography of the Romantic Antiquary Sir Robert Cotton* (London: Faber and Faber, 1962), p. 92.

5 J. Briggs, 'Hope Mirrlees and Continental Modernism', in: *Gender in Modernism: New Geographies, Complex Intersections*, edited by B.K. Scott, (Champaign: University of Illinois Press, 2007), pp. 261.

*Paris* reveals the extent to which texts are embedded in materialist relations.<sup>6</sup> This is easily overlooked: Ann Rigney, writing on literature and antiquarianism, argues similarly to Mirrlees that “what books in the first instance do not show, objects and the material environment may well do,” as if literature is not part of the material world.<sup>7</sup> In fact, our access to literary texts is mediated through our senses, and texts typically *are* tangible: we touch them as we read them. For this reason, digitisation radically alters our sensory experiences with literature. *Paris* is currently most readily accessible online; the first edition is now available on the website of the *British Library*. Digital archives have a curious relationship to the materiality of texts. On the one hand, they provide visual access to texts-as-objects, whereas encoded transcriptions reproduce texts-as-data. On the other hand, digitised texts are almost inherently *immaterial*. How, then, does the digitisation of archives impact how we read (the materiality of) texts? And what is the materiality of virtual objects? Through an analysis of *Paris*, this paper aims to answer these questions, investigating the relationship between digital archives and the physicality of texts and media objects.

## 1 Touching Fictions

Why does Mirrlees, comparing the poet to the antiquarian, write that “it is touch that matters most”? The verb ‘touch’ means, first and foremost, “to make contact with.”<sup>8</sup> This is not true for our senses of sight, hearing, or smell, which the dictionary definition defines as different ways “to perceive.”<sup>9</sup> Derrida, in his monograph on touching, likewise writes that only “taste and touch [require] contact [...] while all other senses perceive over a distance.”<sup>10</sup> Touch is characterised by a closeness that most other senses seem to lack. It is, in our minds, closely linked to affect: to touch also means “to produce a strong feeling or

6 H. Mirrlees, *A Fly in Amber*, pp. 92–93.

7 A. Rigney, ‘Plenitude, Scarcity and the Circulation of Cultural Memory’, in: *Journal of European Studies* vol. 35 (2005) 1: p. 31.

8 “touch, v. 1,” *OED Online*, Dec. 2019, Oxford University Press, [www.oed.com/view/Entry/203877](http://www.oed.com/view/Entry/203877) (accessed January 22, 2020).

9 “see, v. 1,” *OED Online*, [www.oed.com/view/Entry/174749](http://www.oed.com/view/Entry/174749) (accessed January 22, 2020); “hear, v. 1,” *OED Online*, [www.oed.com/view/Entry/85048](http://www.oed.com/view/Entry/85048) (accessed January 22, 2020); “smell, v. 1,” *OED Online*, [www.oed.com/view/Entry/182542](http://www.oed.com/view/Entry/182542) (accessed January 22, 2020).

10 J. Derrida, *On Touching: Jean-Luc Nancy*, trans. C. Irizarry (Stanford: Stanford University Press, 2000), p. 5.

emotion.”<sup>11</sup> It is associated with reality, or verifiability: “tangible” means both “capable of being touched” and “externally real, objective.”<sup>12</sup> The digital seems removed from this type of sensory (and sensuous) experience. Etymologically, of course, it is not: the word ‘digital’ itself is borrowed from Latin ‘digitālis’ (“measuring a finger’s breadth,” “of or relating to the finger”), and is thereby in its origin connected to the sense of touch.<sup>13</sup> In practice, digital media are typically (predominantly) perceived through other senses: sight, and sometimes sound. This creates distance between the reader and the digitised text, altering how we experience texts affectively.

Of course the experience of distance is not unique to the digital realm. In fact, Anne Carson argues that literacy necessarily produces boundaries, claiming that “[a] written text separates words from one another, separates words from the environment, separates words from the reader (or writer) and separates the reader (or writer) from his environment.”<sup>14</sup> Our experience of reading, whether online or in print, seems governed by the visual. Consciously, at least, we seem to perceive texts primarily with our eyes, which is why they are so often seen as distinct from objects. Unconsciously, however, we make use of other sense perceptions to make sense of texts. Matija Strlič, a heritage scientist who studies the smell of heritage, comments that “[l]ibrarians have told us that it’s the smell that hits readers first. It’s the way libraries communicate, before people even get to the books.”<sup>15</sup> Visitors to historic libraries often particularly appreciate the smell of older books, “conferring significance to this aroma through its communal value.”<sup>16</sup> Different senses (touch, smell, sight) all help us ascribe meaning to textual objects. Our written culture relies on different sense perceptions to establish order: letters, books (hardbacks, paperbacks), newspapers are all materially different, our “perception of written culture [is] based on immediate, material distinctions between objects that are associated with

11 “touch, v. 28,” *OED Online*, [www.oed.com/view/Entry/203877](http://www.oed.com/view/Entry/203877) (accessed January 22, 2020).

12 “tangible, adj. 1,” *OED Online*, [www.oed.com/view/Entry/197491](http://www.oed.com/view/Entry/197491) (accessed January 22, 2020).

13 “digital, n. and adj.,” *OED Online*, [www.oed.com/view/Entry/52611](http://www.oed.com/view/Entry/52611) (accessed January 22, 2020).

14 A. Carson, *Eros the Bittersweet: An Essay* (Princeton: Princeton University Press, 2014), p. 50.

15 Matija Strlič quoted in C. Armitstead, ‘Can you judge a book by its odour?’, *The Guardian*, 7 April 2017, <https://www.theguardian.com/books/2017/apr/07/the-smell-of-old-books-science-libraries> (accessed 22 January 2020).

16 C. Bembibre and M. Strlič, ‘Smell of Heritage: A Framework for the Identification, Analysis and Archival of Historic Odours’, in: *Heritage Science* vol. 5 (2017) 2: p. 5.

different textual genres and usages.”<sup>17</sup> This is often an unconscious process of differentiation, which is why books and objects are sometimes seen as distinct categories.

In the archive, books acquire a material presence: a book in the archive is not, affectively, the same as a digitised version. In order to understand the difference between them, it is helpful to consider the distinction between “things” and “objects” as outlined by Bill Brown (borrowing from Heidegger). This distinction relies on the idea that objects are mere items of use that become things when they cease to function. We look *through* objects but we *see* things: they draw attention to themselves primarily when they break down, which changes their relationship to the human subject. Things emerge in an excess; they exist *beyond* “their mere utilization as objects.”<sup>18</sup> More often than not, books are objects rather than things, and readers overlook the material reality of the book in favour of the words on the page (the so-called “linguistic code.”) The status of the book “as a historicized object” is thereby neglected.<sup>19</sup> In the archive, the book re-acquires this status: we are confronted with the “thingness” of the object. Visiting the archive is an event, bound up with cultural codes. Sometimes visitors are asked to wash their hands or told not to wear hand lotion or nail polish. They are made aware of the fact that they are touching an object and that this object is old and perhaps valuable. In the cultural imagination, the archive is also “a place of dreams.”<sup>20</sup> By its presence in this place, the book in the archive exceeds its status as text. The archive highlights the physicality of the text, which can no longer be taken for granted as an object of use or as consisting merely of words. A digitised (or virtual) version of an archival object is fundamentally different from the actual, even as it reveals information about the original, because it lacks this “thingness”: the book becomes data.

## 2 The Material Traces of *Paris*

In the case of *Paris*, the copies of the first edition also reveal their “thingness” by making visible the effort that went into printing it. The first edition of the

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17 R. Chartier, ‘Languages, Books, and Reading from the Printed Word to the Digital Text’, in: *Critical Inquiry* vol. 31 (2004), p. 142.

18 B. Brown, ‘Thing Theory’, in: *Critical Inquiry* vol. 28 (2001) 1: pp. 4–5.

19 G. Bornstein, *Material Modernism: The Politics of the Page* (Cambridge: Cambridge University Press, 2001), p. 6.

20 C. Steedman, *Dust: The Archive and Cultural History* (New Brunswick: Rutgers University Press, 2001), p. 69.

poem continues to reveal traces of how it came into being. In September 1918, Virginia Woolf writes to Mirrlees asking her to write something for the Hogarth Press, operated by Virginia and her husband Leonard. Mirrlees responds that she has “nothing at all that is short & suitable to your Press.”<sup>21</sup> She may have kept the request in mind, because in 1919, Virginia writes that Mirrlees wrote “a very obscure, indecent and brilliant poem, which we are going to print.”<sup>22</sup> The printing of *Paris* proved to be a challenge for the Woolfs, who were amateur printers and publishers at the time: they operated a hand-press that they had purchased in 1917 and that they had taught themselves to use. To make matters worse, *Paris* was only their fifth publication.<sup>23</sup> The poem was difficult to print due to its “erratic margins and use of white space, different sizes of type, Roman and Italic, and hand-binding.”<sup>24</sup> Three proofs survive, and these show that Mirrlees was still editing at the proof stage and meticulously indicated layout and typography, though not all her typesetting instructions were carried out. Virginia Woolf was “almost certainly typesetting directly from a manuscript,” further complicating the process.<sup>25</sup> On a hand-press, unconventional use of spacing and typography were complex tasks for a printer, and the difficulties of typesetting show in the numerous errors visible in the printed copies. Woolf corrected printing errors in pencil in 160 printed copies of the books, and all 175 printed copies were hand-sewn and bound in patterned paper.<sup>26</sup> Because the book is clearly hand-made and contains manual corrections, its materiality is highlighted. It contains both printed works and hand-written corrections: as a result it does not appear as a finished artefact but rather as an assemblage.

The initial small-scale and amateur production of *Paris* by a private press, possibly combined with other material circumstances (such as Mirrlees’ lack of a literary agent or patron and her later reluctance to have her work reprinted), ensured that Mirrlees’ work eventually disappeared from view, and *Paris* dis-

21 Mirrlees quoted in J. Briggs, “Modernism’s Lost Hope”: Virginia Woolf, Hope Mirrlees and the Printing of *Paris*, in: *Reading Virginia Woolf* (Edinburgh: Edinburgh University Press, 2012), p. 81.

22 V. Woolf, *The Letters of Virginia Woolf*, edited by N. Nicholson, (New York: Harcourt Brace Jovanovich, 1976), p. 385.

23 D.E. Rhein, *The Hand-printed Books of Leonard and Virginia Woolf at the Hogarth Press, 1917–1932*. (Michigan: UMI Research Press, 1985), pp. 151, 5–6; S. Parmar, ‘Introduction’, in: Hope Mirrlees, *Collected Poems*, edited by S. Parmar (Manchester: Carcanet Press Unlimited, 2011), p. xxxiii.

24 N. Enemark, ‘Antiquarian Magic’, p. 125; see J. Briggs, ‘Modernism’s Lost Hope’, p. 83.

25 J. Briggs, ‘Hope Mirrlees and Continental Modernism’, pp. 264.

26 J. Briggs, ‘Modernism’s Lost Hope’, p. 84; *British Library*, available at <https://www.bl.uk/collection-items/paris-by-hope-mirrlees>.

appeared into the archive, where many objects “remain perpetually unnoticed and unrecalled.”<sup>27</sup> However, in recent years, literary scholars have begun “to seriously excavate” Mirrlees’ work.<sup>28</sup> In 2007, the edited volume *Gender in Modernism* featured a reprint of *Paris* alongside an introduction and commentary by Julia Briggs. Briggs advocates for the importance of the work for the history of literary modernism and includes a facsimile of the Hogarth Press edition (“typos and all”) in her chapter.<sup>29</sup> Unlike the first edition, Briggs’ reprint of *Paris* includes line numbers, and while printing errors and handwritten corrections are visible in the facsimile, they are corrected in the reprint. Briggs’ commentary is explicitly included “to make [*Paris*] more accessible to today’s readers.”<sup>30</sup> Materially, the reprint is a very different work from the Hogarth Press edition. In 1920, *Paris* was manually typeset, corrected in pencil, and hand-bound. In 2007, it is accompanied by a scholarly introduction and explanatory notes, and it is part of a chapter of an anthology dedicated “to the forgotten and silenced makers of modernism.” Sandeep Parmar’s edition of Mirrlees’s *Collected Poems* (2011) likewise includes line numbers and corrects the printing errors of the first edition. Parmar’s own contribution comes from the archive: she is the first scholar to have had access to Mirrlees’s private papers, and the collection contains several previously unpublished works. Both reprints lack the “thingness” of the first edition: although the reprints make the linguistic code of *Paris* (and other archival materials) easily accessible to present-day readers, students, and scholars, they do not reveal as much about the poem as a historicised object.

### 3 Uploading the Archive

The question remains, then, to what extent the digital archive can make the materiality of a text available to wider audiences. A virtual edition is necessarily immaterial, but the virtual can nonetheless *address* the physicality of texts. Chartier claims that “[i]n the digital world, all texts, whatever their genre, are produced or received through the same medium and in very similar forms.”<sup>31</sup> The digital creates a continuity “that no longer differentiates discourses on

27 A. Rigney, ‘Plenitude, Scarcity and the Circulation of Cultural Memory’, p. 17.

28 M. Mitton, ‘Rediscovering Hope Mirrlees’, in: *Women: A Cultural Review* vol. 24 (2013) 4: p. 369.

29 J. Briggs, ‘Hope Mirrlees and Continental Modernism’, p. 268.

30 J. Briggs, ‘Hope Mirrlees and Continental Modernism’, p. 268.

31 R. Chartier, ‘Languages, Books, and Reading’, p. 142.

the basis of their materiality.”<sup>32</sup> He also argues that it becomes increasingly difficult to perceive individual works *as* works because readers often use the search function or skip to subheadings so that the reading process becomes fragmented and non-linear. This is arguably the case for texts reduced to their linguistic code, which can be read and downloaded online, but less so for scanned pages of books which are then uploaded as images. On the website of the *British Library*, Mirrlees’ poem is not searchable. Readers have to click pages one by one, making the process more similar to reading the physical copy. Moreover, unlike the scholarly editions, the digitised first edition of *Paris* reveals the original errors in typesetting and Woolf’s handwritten corrections, as well as the slightly clumsy, handmade quality of the cover and binding. When visitors access the poem online, the *British Library* offers information about the object: it indicates, for instance, the work’s full title, format, shelf-mark, full catalogue details and other information such as copyright. The *British Library* also includes a content description of the poem, as well as information about the form and the printing process. Visitors have the option to “view images from this item,” after which the website shows them photos of the book alongside a sidebar with additional information (which can be hidden from view). The website allows visitors to zoom in or skip to specific pages, enabling a personally customisable interaction with the text. In terms of access, digitisation offers opportunities: it makes available the *appearance* of the first edition, granting visual access to the text-as-object for scholars, students and enthusiasts who would otherwise never come face to face with a first edition of this text. For modernist texts, whose materiality undeniably matters, this is an important development.<sup>33</sup>

However, digitisation also involves necessary limitations. Firstly, as the above has shown, the digital creates distance. The images of the book—often showing two pages side-by-side at a time—are displayed against a black backdrop, and the book is held open with transparent plastic page holders. It looks formal, unapproachable: the reader does not come into contact with it. The digital archives provide access to information about objects, but it does not provide access to them. Perhaps this distinction is affective more than it is academic. Some of the processes readers use to attribute meaning to text—such as how it feels, or smells—depend on access to the book in its material form. Chartier worries that digitisation “reinforce[s] the idea that there is an

32 R. Chartier, ‘Languages, Books, and Reading’, p. 142.

33 See, for instance, J. Drucker, *The Visible World: Experimental Typography and Modern Art, 1909–1923* (Chicago: University of Chicago Press, 1994), p. 10.



'equivalence' between media and that a text is still the same regardless of its form: printed, microfilmed, or digital."<sup>34</sup> In fact, form does matter: as Marshall McLuhan famously argued in the 1960s, "the medium is the message."<sup>35</sup> Digital and visual access to archival objects, therefore, does not replace the archive. Additionally, influenced by avant-garde themes of materiality and attention to the means of production, early twentieth-century literary texts could "claim the status of being rather than representing," a capacity that scholarly editions and digitised versions do not share.<sup>36</sup> For textual cultures—especially but not exclusively modernist ones—to remain intelligible, physical access to first editions continues to be necessary even as more materials are being digitised.

#### 4 Conclusion

Although the digital archive in its current form cannot replace access to the original, it is worth remembering that—to the historian's frustration—this access is always already mediated. After all, as Carolyn Steedman points out, "[t]he object (the event, the happening, the story from the past) has been altered by the very search for it, by its time and duration: what has actually been lost can never be found. This is not to say that *nothing* is found, but that thing is always something else, a creation of the search itself and the time the search took."<sup>37</sup> Access to the past is necessarily partial, but the digital archive offers this partial access to significantly more people and for that reason alone it is worth focusing on its opportunities more than the limitations. Chartier worries that if texts are "exclusively communicated or, worse, if they were conserved only in an electronic form, there would be a great risk of losing the intelligibility of a textual culture that is inseparable from the objects that have transmitted them."<sup>38</sup> Arguably, it is precisely this fact that makes exclusive reliance on electronic forms unlikely. Of course, in the future, developments in digital archiving technology may successfully (re)create material experiences of texts, and digital archives may at one point form opportunities for radically new forms of textual interactions: developments in digitization are therefore worth monitoring. Although the above is primarily an exploration of archive, it is also an

34 R. Chartier, 'Languages, Books, and Reading', p. 147.

35 M. McLuhan, *Understanding Media: The Extensions of Man*. 1964 (Oxon: Routledge, 2001), p. 9.

36 J. Drucker, *The Visible World*, p. 10.

37 C. Steedman, *Dust: The Archive and Cultural History*, p. 77.

38 R. Chartier, 'Languages, Books, and Reading', p. 150.

exploration of our affective relationships to texts and the extent to which they are governed by sensory perceptions. Ultimately, in the world of texts, it is perhaps still “touch that matters most.”<sup>39</sup>

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39 H. Mirrlees, *A Fly in Amber*, pp. 92–93.

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</chapter 4>

## Digitising the Library—An Interview with Addie Ritter

*Lotte Walvius and Anne Walvius*

*Addie Ritter is a retired faculty librarian who has worked at the TU Library in Delft since 1978 and has had various functions over the years. On behalf of TXT, Lotte and Anne Walvius ask him a number of questions about his career and his views on digitisation.*

*What is your background and how did you end up working for the TU Delft Library?*

I started working at the library at a very young age. Before me, my father and grandfather both worked for the TU Library. My grandfather was one of the first photographers at the library, he worked in the early 1900s, and set up what is now called the audio-visual department. My father worked with my grandfather in the darkroom to develop the photos my grandfather made for educational purposes. They both worked at the TU library until their retirement.

I started working part-time in the closed stacks because the library needed people to help retrieve books and put them back in place. This is how I became interested in library science and decided to pursue an education in this field. I did a library course in The Hague that was a part of the GO (Gemeenschappelijke Opleiding). A variety of courses was available and this helped me gain both knowledge and experience within the field. I kept working at the TU Library during my studies and they paid for my education. In order to pass the course, an internship was mandatory, which is why I did an internship at the National Library in The Hague (KB) and the 'Koninklijke Nederlandsche Gist- en Spiritusfabriek'. Especially the latter internship taught me what it was like to work in a smaller organisation.

*At the beginning of digitisation, what were the first steps to be taken?*

The catalogues were the first to be digitised. There were multiple catalogues which all contained the same cards but were organised in a different way. For example, in one catalogue everything was sorted by title while another was sorted according to subject. There were countless cases with cards and we digitised these first. After that was done, we took part in a collaborative project that focused on the central technical catalogue, containing the catalogues of major Dutch technical companies, such as Philips and other company libraries. After that project we digitised the titles of the journals that were available in the library.

Around 1987, very few computers were available to access the catalogue. Students often had to wait in line if they wanted to search the system. The first computers could not actually do that much, but they were very expensive. We had one very big Honeywell Computer, which took up a whole room, while nowadays, even a smartphone has more capacity.

When we digitised the card indexes, we had to enter the information into a library system called Aubid (Automatisering bibliotheek informatie Delft). Interestingly, Aubid also functioned as a financial administration and loan system. Nowadays, systems similar to Aubid are used at various universities. Of course, searching digital files is much quicker nowadays than it used to be; authors and titles are easily found. The system shows related works as well, which might even incite new interests. This is a huge advantage of the digital library files. However, plenty of material still needs to be made available. A digital map, for example, however beautiful, is only useful once it is described properly. Users need to know who made it, who printed it, what can be seen, and the year of publication etc.

*And when were the actual texts digitised?*

That was done much later. The physical copy and the digital version usually existed side by side. Nowadays, there are often only digital subscriptions, without any paper copies. Many journals were made digitally available, but not all of them because of a lack of staff. The most popular journals were the first to be digitised because the library staff had to get these titles from the stacks quite frequently. Some copies were read so much that they got damaged or sometimes parts were cut out. Digitising these journals helped to preserve the physical copy. *Does that mean that physical copies are thrown away after digitisation?* Some people want that, yes, but it does not happen. At

one point, there was even talk of getting rid of the Trésor (the Special Collections), but this never happened.

*Were there particular difficulties when it came to digitising texts?*

External companies digitised a lot of our material with an automated process. However, the content was sometimes unreadable or only partly photographed or scanned. Our task was to spot these mistakes and send the faulty texts back, after which the process had to be repeated. A digital text that was unreadable was useless. The companies that did the digitising did not always check what they sent back, but we wanted to have a good end result.

*Do you believe information gets lost when digitising?*

Yes and no, all information is transferred to a system which is more easily accessible. Otherwise, some books would remain in the stacks and never be requested. The advantage of those crazy databases is that they enable students to find works they might otherwise not have found, but are very useful to them. However, the storage of some items is rather difficult. Some maps, for example, consist of an enormous number of gigabytes and can hardly be downloaded. On the website, only a small map is shown and students have to come to the library with a hard disc or USB to get the proper file. Although the quality is great, it is difficult to transfer these kinds of files.

*What are some of the other changes that digitisation brought about?*

With the switch to electronic journals, the administrations that used to be responsible for processing the journals changed. Unpacking, stamping, binding, or entering journals into a system and placing them in cabinets or on shelves was not necessary anymore. This had certain advantages of course, but many jobs were lost and entire administrations were abolished. Besides this, courses were made available for the staff in order to acquire digital skills. With these new skills you could grow within the library, as new jobs that required digital skills became available. Some courses were mandatory because our management wanted a well-educated staff.

Occasionally, staff members themselves took the initiative to digitise because we thought it was an interesting development. For example, we started entering hand-typed theses into the system. These were copied by hand by dif-

ferent staff members which was a rather slow process. Eventually, this work was outsourced to companies with machines that automated this process. Our task then was to check these copies, because the machines occasionally made mistakes.

*What are your thoughts on the security of digital systems and material?*

Recently, as you probably know, the computer system of the university in Maastricht was hacked. The university used a system which enables users to work from home. These systems have particular advantages such as cutting travel-time and being able to focus (at home), without being distracted by colleagues or students.

Nowadays, especially with the dangers of hacking, it is of the utmost importance that everything has a backup. If documents get lost, so is your work. In other words, security is very important. Information can easily get lost and it is impossible to work once a system is down. So, we can continue with scanning and digitising everything, however, I personally just get a good feeling from a very beautiful book with pictures and maps. That experience is so very different from the digital stuff one looks at from behind a tablet or computer screen. What's more, these materials cannot be hacked. Seeing, feeling, and smelling the old books and materials: nothing tops that.

*Do you personally prefer analogue or digital material?*

I think both, but in my heart, I am more in favour of the analogue book or journal. However, the financial aspect is also important to keep in mind, because the storage of physical books and journals is very expensive. Storage spaces fill up and additional space is eventually necessary but not always available. New materials keep coming and nothing can be thrown out.

There used to be many faculty libraries, but in 1989 a new law stated that there could only be a single library per university, so all these other libraries were closed. This meant, once more, that many jobs were lost and quite some material was thrown or taken by students or staff members. When a library was remediated, their collection was compared to that of the central library. If material was not present in the latter, it was shipped there while other material was thrown out. This meant that the central library received extra books but had to store these as well. The different faculties used the services of the central library but had to pay for this and a contract was established.

A copy of particular material was one guilder in my time, so if an article was requested in the library, the person would get an envelope with the copy and a bill. This was how money for storage was regained, which was rather strange considering this was all within the TU.

*What about the university's employees, students, and researchers, do they prefer digital material?*

Yes, especially students are digitally more equipped. In my time, around forty-five people worked in the stockroom to search and copy material, while nowadays there are only a few. Many jobs were lost here as well because physical books are not requested a lot. However, the TU has one very important library, the Library of Architecture ('Bouwkunde bibliotheek voor architectuur'), where analogue material is used more often than digital material. The students who come here like to search through the books in order to look at the drawings and evaluate the colours. This library is also the only faculty library that is part of the TU.

*Do you think this interest in physical books has to do with the background of these students?*

I believe so, yes, especially students of Architecture and Industrial Design Engineering. These students like to hold materials in their hands and they often get assignments from their professors to look at certain materials in real life. Visual studies, that is the right word!

*In your opinion, has digitisation had a positive or negative impact on the library?*

For us as a library, it has mostly been positive. As an academic library, especially in the field of math or chemistry, our students and researchers very much appreciate all those digital files on a database. They can search through a lot of material, very quickly. In the past, people would take months reading in books to get certain information, whereas nowadays, a lot of the information is readily available through a database.



*Does that mean that the demand for printed books is becoming less?*

Yes, I believe so. I used to work at the Information Desk where I got a lot of questions about books, but that is different nowadays.

*Is the library, as a physical space, changing because of digitisation?*

The function of our library is certainly changing. Eating and drinking used to be prohibited and people were asked to be quiet. Now, almost everything seems possible. The library is changing into a meeting place, a social space. Studying quietly is becoming the exception. There still is one place where students need to be quiet, I believe, but the rules keep changing to be honest. People no longer need to go to the actual library to study or search for books or journals. Everything can be done from home or from the other faculties, which means that the function of the library is changing.

However, the library is full of people every day, which is really incomprehensible. We have about a thousand study places and are open until 24:00, and sometimes even until 02:00. Students, apparently, need a place to study even though they could theoretically do it from home. For this reason, I believe the library as a physical space will not disappear. What's more, students do not really have a place to meet each other and discuss matters, so it is also about socialising. Members of certain student associations, for example, often sit together; they even have a fixed spot in the library where they meet each other. When the library opens in the morning, they are usually waiting outside to get in and find their places. But besides the members of student associations, the library really is a place where people come to study and we often see the same faces. Once people discover the library as a study space, they often return. There are even students who leave their stuff in the evening in order to secure a place for the following day. The library really is a wonderful space. It's cosy, there is almost always space available and there is a coffee-corner. People can even sit on the roof if they want to!

One thing that has changed because of digitisation is our interaction with students. When I worked for the library of Architecture, I knew a lot of the students and I was familiar with the projects they were working on. When a new book arrived that might be useful, I could inform them when I saw them at the library. That really changed with digitisation. Nowadays, students often look for sources themselves and do not go to the library staff for help. Even though they might be pointed towards different books or sources when asking someone from the library. Previously, you could only get this kind of informa-

tion if you went to the library. Nowadays, however, students can also request help digitally, for example, in a chatroom. In the very beginning, a robot was installed that could answer most basic questions. In addition, appointments with literature specialists could be made online, who would then visit you and help with your search. However, this was very costly and could be about 250 guilders for a search question. This kind of work is definitely changing because people think they know and can do things themselves. Databases can certainly be easy, but they also have their difficulties and can be very confusing.

Another thing that changed with digitisation is that plagiarism became easier to spot and systems like Turnitin were developed. Plagiarism is, of course, bad for the university, which is why we got the task to teach students about these rules with special courses such as 'Information Skills'.

*Would you say that digitisation is the main task of libraries today?*

Not necessarily, no. Our main tasks are always changing. Online Learning and Open Access are definitely among the more important library tasks these days, meaning that everything is freely accessible after logging in. The last four years of my career I was a part of the department of Education Support. We offered courses, called Information Skills 1, 2, 3, to regular students and PhD students to teach them the skills to find all kinds of information that they had no knowledge of, for example, how to tackle databases the right way. We handled questions like: How do you look for sources in general? There are different kinds of databases and they all work differently. How do you get the right results? We tried to teach the students to look beyond the surface of search results and to really delve deeper.

*You mentioned working together with other universities and since TU Delft was often at the forefront when it came to digitisation, did you notice any differences when it came to other universities and their digital material?*

When I worked together with other universities, this had to do with the Map room of the TU ('kaartenkamer'). I was part of a cooperation of map curators from Leiden, Amsterdam, Groningen, Tilburg, Utrecht and Delft. Each year, we would meet a few times in order to discuss the digitisation of our material. At first, everyone did things in their own way, which I think still happens occasionally. It concerns your own collection and you might not always want

to share that. What's more, digitisation comes with author rights, meaning that data cannot be easily shared and sources always need to be mentioned. These things, especially in the beginning, made it difficult to successfully work together.

*Is there a particular digitisation project that stands out for you?*

That would be the *Colonial Architecture Project*, the last project I worked on. A staff member of the TU actually initiated this project. The KIT library (Royal Tropical Institute) was abolished and all their material written off. A lot of it had to be remediated, but was saved digitally and is therefore still accessible. Besides books, maps were also made available online. Using a technique called georeferencing, coordinates were put on these maps which makes it possible for them to be linked to modern maps of the real world. For example, an old map of Indonesia can be laid over a modern map, enabling researchers to see where things were or are and what is left of particular buildings or places.

The TU Library provided the software, equipment and other technical aspects to host and digitise the material, which eventually resulted in a website and online repository. I remember getting all the lists of the different titles and numbers and the containers full of material that were sent over from the Royal Tropical Institute. Everything had to be digitised and, afterwards, checked for mistakes. Some books contained intricate fold-out maps that had to be handled with care and had to be scanned in separately. These were beautiful maps that formed a part of the book. All of them are now available online at [colonialarchitecture.eu](http://colonialarchitecture.eu). Not only the maps but also the texts from the books were digitised. Character reading was added to these files, which enabled text-searching. The entire texts can be found on the website. The maps that these books contained are part of those files and were added as the last couple of pages of the file. I am quite proud of that project, as it was the last one I was a part of.

*What is your view on the future of the library?*

Whether the library would remain important in the future has been a question since the start of digitisation. Back in 1987, people were already wondering if the library would even make it to 2000. We thought the library might become obsolete because people could gather the information they needed themselves using the various systems set in place by us. However, I believe that the library,

as a place, will remain and never disappear entirely. The library, as an institution, will most likely keep reinventing itself and might have a completely new function around 2050. The TU library, because it is housed in a very modern building, could easily change functions.

*This interview was translated from Dutch*

</chapter 5>

## Text in Transition: The Digital Aesthetics of ‘Word-Image Hybridity’

*Helena Schöb*

Just as manuscript conventions remained present in printed texts after Gutenberg, we, too, are living through a time of overlap between textual mediums—notably, printed books and digitised texts. In this period of transition, human-readable digital text is still very much in the process of creating a qualitatively new aesthetic for itself. Only in use for a number of decades, it has yet to develop into its final, definitive form. For the time being, the digital space remains somewhat of a wild west, in which new breeds of text ferociously compete for limited consumer attention. In this digital environment, new breeds of texts are appearing by gradually adapting to the ever-changing demands made on text. As Richard Dawkins already argued in the 1970s, cultural products and expressions, too, are capable of developing according to evolutionary principles.<sup>1</sup> At a time of rapid textual transition and innovation, 21st century humanists will have to grapple with the impact the digital medium will have on the texts they transport. A serious philosophical effort should be made to define, or at least approximate, what exactly the ‘digital textuality’ of the present and future will look and read like. This essay will investigate a property which, arguably, is unique to digital text at its current stage and which can be termed ‘word-image-hybridity’ or ‘text-image-hybridity’. It shall be defined as the increasingly prevalent supplementation of text with image in the digital medium, to the extent that the two merge into a single aesthetic unit and become virtually inextricable. This concept of digital ‘text-image-hybridity’ is, at least in part, inspired by Vilém Flusser’s radical notion of modern media technologies rendering text obsolete by ushering in a new, image-dominated culture. While writing is unlikely to completely lose dominance anytime soon, it indeed aspires more and more towards the aesthetic and functional properties currently attached to images. Digital technology’s multimodality crucially facilitates this confluence, allowing for a new kind of interplay and closeness

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<sup>1</sup> For Dawkins’ theory on how the biological principles of evolution could also apply to culture, see R. Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1976).

between words and images, and eventually leading to a transformed sense of textuality. This new textuality works in accordance with a more visual, imagistic logic, wanting to be read and understood almost instantaneously and at a glance. As a consequence, concise, diagrammatic text formats dominate digital news outlets, education materials and social media, and words rarely appear unaccompanied by images and vice versa. This essay attempts to answer some of the questions which arise from this new textual paradigm:

- a) Is the convergence between text and image a wholly new phenomenon, confined to the emergence of digital technology?
- b) Is the hybridising relationship between text and image mutually complementary and symbiotic, or mutually destructive and rivalrous? Could Olson's 'illocutionary force of the utterance' be partially restored to text via the multimodality of digital formats?
- c) And finally, will the current differences between word and image eventually converge and disappear completely into a homogenised textuality, or is this dichotomy bound to coexist distinctly?

In his book *The Rise of the Image, the Fall of the Word*, Mitchell Stephens picks up on the antagonistic relationship between word and image (especially the moving image), and diagnoses a gradual replacement of the former by the latter as 'the predominant means of mental transport.'<sup>2</sup> Stephens insinuates that this is the troubling result of the proliferation of mass media, one that relinquishes complex abstraction in favour of straightforward sensuality. Stephens is by no means the first to write about the anxiety surrounding the word-image rivalry in the arena of human expression. In the anthology *Symbolic Articulation: Image, Word, and Body between Action and Schema*, Jürgen Trabant charts a whole history of ideas surrounding this duality. Trabant begins with Aristotle's *De interpretatione*, summarising the Greek philosopher's concept of the word-image distinction as follows: 'The *cognitive* function is fulfilled by *images*,' meaning that as an image impresses into the mind, it instantaneously transforms itself into a thought. Conversely, words have a '*communicative* function' in that they 'are not visual entities; they are composed of sound [...] and this sound is not similar to the thought it transports.'<sup>3</sup> This means that while images directly produce mental likenesses and are therefore quasi-equivalent to thoughts, spoken words are communicative signs which must first be con-

2 M. Stephens, *The Rise of the Image, the Fall of the Word* (Oxford/NY: Oxford University Press, 1998), p. 11.

3 J. Trabant, 'Language and Image as Gesture and Articulation', in: S. Marienberg (ed.), *Symbolic Articulation: Image, Word, and Body between Action and Schema* (Berlin, Boston: De Gruyter, 2017), p. 50.

verted and translated into intelligible thoughts. The Aristotelian view, while popular and instructive for many centuries to come, was modified somewhat in the Middle Ages. Art historian Mary Carruthers writes that medieval theorists did not meaningfully distinguish between ‘verbal’ and ‘visual’ memory.<sup>4</sup> As both paintings and poetry were able to effectively evoke images in the mind, no strict conceptual separation was deemed necessary. The important nexus between image and text was their shared metaphorical power. Whether their summoning of mental pictures was achieved directly (in visual art) or indirectly (in poetic writing) was largely irrelevant.

In his paper, Trabant makes a similar, modern attempt at converging image and word through the common concept of articulation, which he broadly defines as the practice of using symbols to structure, order and portion out meaning. Trabant borrows philosopher Ernst Cassirer’s characterisation of man as an ‘animal symbolicum’, availing itself of various symbols—be it images, writing or speech—for the expression and externalisation of rational and emotional processes.<sup>5</sup> He invokes 18th century figures like Giambattista Vico and Gotthold Ephraim Lessing, who regarded language and image not ‘as enemies but as “twins” (*gemelle*) and as “friendly neighbors [sic]” (*freund-schaftliche Nachbarn*).’<sup>6</sup> Trabant’s Lessing citation, however, is somewhat misleading in its representation of the German thinker’s overall thoughts on the subject. In his prominent essay on aesthetics *Laokoon oder über die Grenzen der Malerey und Poesie* (1766), Lessing argued against an overly hybridised understanding of images and words, which was originally put forward by the Roman poet Horace in his dictum *ut pictura poesis* (‘a poem is like a painting’). While Lessing admitted that word and image can very well be friendly neighbours, he also insisted on their differences, and was clear in his preference for textual over visual art. He grounded this aesthetic hierarchy in the simple but incisive observation that language enables a more complex presentation of things as they happen *one after the other* in chronological or causal order. Images, on the other hand, are confined to presenting things that are static, frozen in time, and arranged *next to each other*.<sup>7</sup> Here, Lessing affirms his reputation as the quintessential Enlightenment poet, overly keen to categorise and hierarchise.

4 See M. Carruthers, *The Craft of Thought: Meditation, Rhetoric, and the Making of Images* (Cambridge: Cambridge University Press, 2000), p. 122.

5 E. Cassirer, *An Essay on Man* (New Haven, London: 1944), p. 26.

6 J. Trabant, ‘Language and Image as Gesture and Articulation’, p. 49.

7 See G.E. Lessing, *Laokoon oder über die Grenzen der Malerey und Poesie*, 1766 (Gutenberg-Project, 2004) <http://www.gutenberg.org/cache/epub/6889/pg6889-images.html> (04 January 2020).

Given his preference, he would have probably been very surprised to find the superiority of text being seriously questioned only three hundred years later.

It was 20th century media theorist Vilém Flusser who began to think more radically about our collective shift away from textual thinking toward the phenomenal world of images. Remarkably, he understood this movement as a cyclical return to the primal, imagistic origin of prehistoric cultures through technological means. After thousands of years of image-dominance, so Flusser argues, the Enlightenment suddenly began to privilege text on the basis that it accommodates rationality and abstraction better than the image (as confirmed by Lessing's aesthetics). Enlightenment philosophy allowed texts to 'succeed in forcing images and their magical myths into the corners of museums and the subconscious.'<sup>8</sup> The collectively repressed image is now making a return, using computational structures to reassert itself over a textual logic that no longer meets the demands of modern society. Sjoukje van der Meulen quotes Flusser's *Für eine Philosophie der Fotografie*, illustrating how for Flusser, the pixel and the ancient cave painting both exist on a conceptual continuum and perform a kind of 'magic' on the human mind: 'Prehistoric magic is ritualization of models known as myths; current magic is a ritualization of models known as programs.'<sup>9</sup> The digital image, then, is simultaneously the return and progression of an ancient force that was only temporarily disrupted by linguistic text. Flusser expresses this in his signature oracular language: 'Texts [...] have become unclear. They collapse into particles that must be gathered up. This is the level of calculation and computation, the level of technical images.'<sup>10</sup> Here, Flusser manages to be oddly clear and cryptic at the same time. To him, text is an obscurant, and after its brief period of supreme usefulness, it is now gradually decaying into ambiguity and unknowability. Within the computational space, technical and digital images are a natural and inevitable progression resulting from the dissolution of text. They offer a direct, immediate and non-sequential mediation of ideas. In Flusser's words:

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8 V. Flusser, *Die Schrift. Hat Schreiben Zukunft?* (Göttingen: 2002, orig. 1987), p. 141.

My translation of the original passage:

'Den Texten ist erst nach dreitausendjährigem Kampf, erst im 18. Jahrhundert der Aufklärung gelungen, die Bilder und ihre magischen Mythen in Winkel wie Museen und das Unterbewußtsein zu drängen. Der gegenwärtige Kampf wird nicht so lange währen. Das digitale Denken wird weit schneller siegen.'

9 Flusser's *Für eine Philosophie der Fotografie*, as quoted in S. van der Meulen, 'Between Benjamin and McLuhan: Vilém Flusser's Media Theory', in: *New German Critique*, 37, no. 2 110 (2010), p. 188.

10 V. Flusser, *Into the Universe of Technical Images*, orig. 1985 (Minneapolis: University of Minnesota Press, 2011), p. 7.



When images supplant texts, we experience, perceive, and value the world and ourselves differently, no longer in a one-dimensional, linear, process-oriented, historical way but rather in a two-dimensional way, as surface, context, scene.<sup>11</sup>

The difference between text and image, then, is not merely aesthetic but cognitive, in that they each encourage and cultivate different ways of thinking. This is relatively easy to contend with when, like Lessing and Flusser, this duality is conceptualised as rivalrous: when one ascends, the other is suppressed, and over time, these dynamics are inverted and re-inverted cyclically. What is more complicated, however, is that 21st century technology seems to allow for a relatively organic and equitable fusion of the two. In the digital medium, image and text, thesis and antithesis, could finally be resolved in a hybridised synthesis. Digital text-image-hybrids reconcile a seemingly insurmountable aesthetic antagonism, but also open up new challenges.

Why, however, do we feel that the digital medium renders text more image-like? In his 2011 study of the textual medium within digital environments, Adriaan van der Weel observes that the human reader is a *homo typographicus* who relies on a text's typographic layout, structure and design to transmit a good portion of its meaning.<sup>12</sup> For instance, the fact that an essay's title, written in a big and bold font, intuitively registers as superordinate to the smaller text body, follows an optical logic rather than a textual one. In this way, titles, subtitles, paragraphic units, font type and size, margin width and line spacing, as well as bold, italicised or underlined text crucially aid our understanding of textual information, but are not, strictly speaking, textual elements themselves. What Van der Weel terms 'paratextual features'<sup>13</sup> are those aspects of texts that enrich our interaction with text by drawing on other sense perceptions. Such paratextual features obviously predate digital text, but digital interfaces multiply and complicate the ways in which visual and textual elements interact and merge. The importance of a text's visual appeal asserts itself in the customisable mise-en-page now offered by many e-reading devices, websites and smartphone applications, but also in the increasing attention publishers pay towards designing aesthetically pleasing book covers.

Imagistic dominance manifests itself, too, in the ever-progressing condensation and economisation of text towards an almost stenographically short

11 V. Flusser, *Into the Universe of Technical Images*, p. 5.

12 See A. v. d. Weel, *Changing Our Textual Minds: Towards a Digital Order of Knowledge* (Manchester University Press, 2011), p. 19.

13 A. v. d. Weel, *Changing Our Textual Minds: Towards a Digital Order of Knowledge*, p. 51.

length—one only has to look at the slivers of text that pass for ‘articles’ on many non-paywalled online news outlets. Small smartphone screens, numerous distractions and minimised attention spans result in the presentation of textual information in its shortest possible form, preferably alongside a photograph or an infographic, the latter being another text-image-hybrid seeing manifold application and diversification in the digital era. Even the innocent hyperlink rewrites the old laws of text in a crucial way. When hyperlinked, phrases and words feel less like self-contained semantic units, confined to a single text, and more like haptically accessible portals, interconnected with other locations in cyberspace. They undermine what Flusser’s previous quotation describes as the ‘one-dimensional, linear, process-oriented, historical way’ of text and replaces it with the ‘two-dimensional way’ of the image.<sup>14</sup> Whereas Flusser welcomes this change, Sven Birkert’s *The Gutenberg Elegies* laments the digital loss of ‘historical perception’ and textual ‘notions of logic and sequential succession.’<sup>15</sup> For Birkert, ‘the print medium exalts the word’ while ‘the electronic counterpart reduces it to a signal’.<sup>16</sup> Both writers correctly observe the shift from the sequential, temporal textuality of print, to the truncated, spatial textuality of digital writing.

Further evidence of the creeping dominance of image over text can be found in the large success of Instagram poetry, which consists of exceptionally short and accessible verse, always accompanied by a related photograph or drawing. Controversial Instagram poet Rupi Kaur has recently been awarded the title of ‘writer of the decade’, suggesting that this genre of text-image-hybrid has a place in the new literary establishment.<sup>17</sup> This type of online art-poetry, despite its formulaic simplicity and reliance on visual enhancement, may be a precursor to the digitally produced literature of the future. A current noteworthy example of digital-born fiction is the Hooked app, launched in 2015, with which users consume multimedia short stories in the form of fictional text messages, photos and even videos, and interactively change the storyline as they read.<sup>18</sup> Already, artificial intelligence has begun to take on the task of

14 See V. Flusser, *Into the Universe of Technical Images*, p. 5.

15 S. Birkerts, *The Gutenberg Elegies: The Fate of Reading in an Electronic Age* (New York: Fawcett Columbine, 1994), p. 123.

16 S. Birkerts, *The Gutenberg Elegies: The Fate of Reading in an Electronic Age*, p. 123.

17 R. Alam, ‘Rupi Kaur is the Writer of the Decade’, in: *The New Republic* (23 December 2019) <https://newrepublic.com/article/155930/rupi-kaur-writer-decade> (04 January 2020).

18 A. Rowe, ‘Storytelling Startup Hooked Debuts a Snapchat Hosted Multimedia Thriller Today’, in: *Forbes*, 26 October 2018 <https://www.forbes.com/sites/adamrowe1/2018/10/26/storytelling-startup-hooked-debuts-a-snapchat-hosted-multimedia-thriller-today/#48377d29295c> (12 January 2020).

producing coherent and even 'literary' texts, as evidenced by auto-generated news reports, algorithmically authored tweets, or the first machine-written novel.<sup>19</sup> Here, texts are created along complex computational patterns that are initially visualised, modelled and mapped out by programmers. It will be up to the literary scholars and digital humanists of the future to determine the qualitative differences between texts that originate from intelligent structures of code, and those that surface from the murky psychology of a human author.

More and more, even non-digital-born texts have to adapt to the formalised demands of digital technology. When textual materials in libraries and archives are to be digitally preserved, they are not simply transcribed, but parsed for relevant information, structured and encoded in the interest of machine-readability. Digitisation requires human-generated texts to adhere to a computational design (like, for example, the TEI standard), and once digitised, the text begins to lead a parallel, machine-readable existence that completely bypasses most human users. Instead of retaining its intuitive or purely argumentative flow, the text receives a structured body, and is forced into a diagrammatic form that the programme can recognise and work with. Basic text encoding will usually follow a visual framework, like a tree diagram, or a so-called Ordered Hierarchy of Content Objects (OHCO).<sup>20</sup> The imposition of a hierarchised scaffolding, while necessary from a computational perspective, remains largely invisible to human readers and happens mostly 'behind the scenes', within cascades of inaccessible code. The internal logic underlying these texts has nonetheless been fundamentally altered by the process of encoding, and in the future, the presentation and consumption of these texts is likely to slide further and further away from their unstructured, non-encoded, analogue originals. If reading instructs how we think, and if what we read increasingly borrows its structure from pictorial models, graphs and diagrams, then surely our thinking is also bound to become more visual and spatial, and less textual and temporal. Van der Weel aptly observes the relative 'transparency or invisibility'<sup>21</sup> of the textual medium to our sensory awareness. While this quality makes it a particularly effective carrier for abstract, non-tangible ideas, it also renders text extremely elusive and malleable, making it hard for humans to really *see* when the medium undergoes a dras-

19 See B. Merchant, 'When an AI Goes Full Kerouac', in: *The Atlantic*, 01 October 2018 <https://www.theatlantic.com/technology/archive/2018/10/automated-on-the-road/571345/> (12 January 2020).

20 See A. v. d. Weel, *Changing Our Textual Minds: Towards a Digital Order of Knowledge*, p. 56.

21 A. v. d. Weel, *Changing Our Textual Minds: Towards a Digital Order of Knowledge*, p. 34.

tic formal change like the one outlined above. Therefore, the inconspicuousness of text only accelerates our departure from the expressive, uncontrollable order of the word, towards the schematic, neatly delineated order of the image.

Despite all of the reasonable skepticism one might have towards it, the confluence of image and text is clearly not going to be reversed any time soon. One might even say that with the advent of the digital medium, their old rivalry has finally been resolved. After all, in the great equaliser of digital technology, both words and images are nothing but bits and bytes. This may be why computer scientists see no problem in treating images and texts almost interchangeably, as evidenced by Been-Chian Chien's recent attempts at improving the searchability of large-scale image databases.<sup>22</sup> To optimise the retrieval of images using semantic search terms, Chien experimented with 'image classifiers, similarity image matching and association mining of image labels'<sup>23</sup> to create effective mechanisms for the automated annotation of images. The programme was able to navigate and cross-reference with ease between image and text. However promising such multimodal systems may be, they should also give humanists some cause for concern. Entrusting algorithms with managing vast, interconnected collections of texts and images could mean handing over a highly complex and culturally significant responsibility from the humanities to big tech.

The much-needed intersection between humanist academia and computer science is now commonly referred to as the digital humanities. Self-proclaimed digital humanist Christof Schöch writes enthusiastically about the emerging cooperation between image and text in the world of data science, where both can be employed to give accurate and well-presented overviews of vast amounts of information. Schöch helpfully summarises the crucial differences between smart data (mostly textual data that is heavily encoded and structured) and big data (large bodies of statistical data which requires visual representation) in the following way:

Big data requires visualization to even start understanding its possible structure [...]. In big data applications, outliers, errors and ambiguities are said to matter little because they get smoothed over by the sheer quantity

22 See B.C. Chien, 'Large-scale image annotation with image-text hybrid learning models,' in: *Soft Computing—A Fusion of Foundations, Methodologies and Applications*, 21 (2017), pp. 2857–2869.

23 B.C. Chien, 'Large-scale image annotation with image-text hybrid learning models,' p. 2857.

of information that is good enough, whereas smart data makes exceptions and ambiguities explicit and effectively reduces possible ambiguities.<sup>24</sup>

It seems that smart textual data's accommodation of nuance and irregularity would speak more to the humanities, while the general, homogenised trends presented in visualised big data would be more meaningful to the sciences. However, as the humanities are increasingly tasked with wielding large quantities of multimodal data, visualising this information may become more common. The sheer quantity of interconnected data stored in libraries and archives will eventually leave us no choice but to amalgamate text and image digitally, and to create text-image-hybrid data pools which can be searched and mined indiscriminately. Unfortunately, this may lead to interesting ambiguities falling through the cracks, and could pose problems in situations where a more careful and differentiated treatment of textual and visual objects is needed.

Within the field of education, cultivating a media-literacy that is differentiated and sensitive to digital multimodality is proving quite the challenge. The European research initiative Evolution of Reading in the Age of Digitisation (E-READ) brought together 200 scholars from all over Europe to discuss and evaluate the use of digital tools within educational contexts, particularly in regards to teaching reading and literacy skills. The declaration issued a very clear warning that long-form text comprehension was shown to deteriorate severely with the use of digital text.<sup>25</sup> This resonates with the correlation between rising online text consumption and declining rates of concentration and reading comprehension, as illustrated by science author Nicholas Carr. For Carr, the internet (despite or perhaps precisely because of its visually enhanced texts) generally produces texts that make our reading more shallow.<sup>26</sup> However, E-READ also admitted that 'digital text offers excellent opportunities to tailor text presentation to an individual's preferences and needs,' and that 'benefits for comprehension and motivation have been demonstrated where the digital reading environment was carefully designed with the reader in mind.'<sup>27</sup> The problem seems to be that the majority of digital text is not designed with the caution and thoughtfulness necessary to effectively convey knowledge.

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24 See Conclusion in C. Schöch, 'Big? Smart? Clean? Messy? Data in the Humanities', in: *Journal of Digital Humanities*, 2 (2013) <http://journalofdigitalhumanities.org/2-3/big-smart-clean-messy-data-in-the-humanities/> (04 January 2020).

25 E-READ Action, *Stavanger Declaration*, 2018 <http://ereadcost.eu/wp-content/uploads/2019/01/StavangerDeclaration.pdf> (22 October 2019).

26 See N. Carr, *The Shallows: What the Internet is doing to our brains*, (New York, London: WW Norton & Company, 2011).

27 E-READ Action, *Stavanger Declaration*.

To investigate what an intelligently visualised, reader-oriented digital text could look like, Korean academic Sung-Hee Jin conducted the following study: 141 university students were given educational reading material that employed visual aids in a systematic and intuitive way. The design of the digital material was subject to a number of simple schematic guidelines, such as the use of motion to dynamically highlight important keywords and their meanings: 'Present the title or key phrases dynamically in an image so that their meanings can be visually prominent.'<sup>28</sup> Another strategy entailed '[locating] the pages that are interconnected in meaning closer to each other or [presenting] them in an identical background color ...'<sup>29</sup> Other visual design aspects included the use of 'a multi-window browser to organize pages hierarchically', as well as tree diagrams, treemaps and condensed, at-a-glance summary pages.<sup>30</sup> By applying this visual enhancement scheme to digital text, Jin was able to noticeably improve the students' retention of information and reading comprehension.<sup>31</sup> While some of the measures taken (such as writing in colour, using tree diagrams or organising a syllabus hierarchically) are not necessarily limited to digital text, the use of motion and multi-window interfaces definitely is. What may rather surprisingly come into play here is Maurice Merleau-Ponty's concept of the 'gesture', which ascribes to every communicative act an additional dimension of physical movement (*kinesis*). In Jin's study, the gestural quality that analogue text usually lacks is restored to the digital text through the use of dynamic, motion-oriented effects. This digitally augmented study material is both imagistic and kinetic: it is visually stimulating and diagram-heavy, but also reintroduces to the text a sense of physicality and action. This could be the beginning of a solution to a problem that was already described by David Olson's 1994 monograph *The World on Paper*. While Olson speaks of the invention of writing as a groundbreaking cultural technology, he also admits that certain key communicational features of spoken language are lost in the medium: 'A written transcription of what was said fails to represent illocutionary force [of the utterance].'<sup>32</sup> In an ironic twist, the digital possibilities for paratex-

28 Table 1 in S.H. Jin, 'Visual design guidelines for improving learning from dynamic and interactive digital text', in: *Computers & Education*, 63 (2013), p. 250.

29 Table 1 in S.H. Jin, 'Visual design guidelines for improving learning from dynamic and interactive digital text', p. 250.

30 See Table 1 in S.H. Jin, 'Visual design guidelines for improving learning from dynamic and interactive digital text', p. 250.

31 See S.H. Jin, 'Visual design guidelines for improving learning from dynamic and interactive digital text', pp. 255–256.

32 D. Olson, *The World on Paper: The Conceptual and Cognitive Implications of Writing and Reading* (Cambridge University Press, 1994), p. 264.

tual supplementation and dynamic enhancement (such as the ones utilised in Jin's study) could inadvertently re-visualise, re-physicalise and therefore re-humanise written text.

A compelling case for the re-humanising aspects of digital text can be found in *The World Made Meme* by R.M. Milner. Arguably the most prominent text-image-hybrid of the 2010s, the meme deserves scholarly attention not only because of its unique aesthetic properties, but also because of its social impact. According to Milner, 'memetic media are premised on participation by reappropriation ... [they] are aggregate texts, collectively created, circulated, and transformed by countless cultural participants.'<sup>33</sup> The digital meme acts as both a symbol and an agent of new forms of social interaction and community building. Memetic media's trademark strategy of collaborative reappropriation destabilises conventional notions of intellectual property, and introduces revolutionary practices of collective text production and distribution. It could even be said that the meme became this uniquely democratised pillar of cultural expression precisely because of its text-image-hybridity. Since memes speak to both visually and textually adept readers, they are able to reach an incredibly vast and diverse pool of users across the globe. At their best, memetic media show how text and image can successfully play to each other's strengths, and work together in a kind of multimodal symbiosis that would have only ever been possible in a digital world.

As established in this essay, digital textuality is evolving away from the traditional linearity and fixity of print, towards a more visual and dynamic aesthetic. At this point in time, it is still too early to make definitive verdicts on the societal, cultural and cognitive consequences that this development will have on future generations. Looking back, David Olson revolutionised our understanding of writing as a technology that prompted early human cultures to develop 'metalinguistic awareness'.<sup>34</sup> Writing, according to Olson, allowed us to discover semantic units and to define the previously indiscernible linguistic rules of spoken language. If such intellectual advancement could be brought about by a simple etching tool and a clay tablet, and if the invention of the printing press had the massive cultural and economic impact that it did, then it is hard to fathom what insights digitally rendered text will bring to the forefront of human consciousness. What kind of skills are we unwitting-

33 R.M. Milner, *The World Made Meme: Public Conversations and Participatory Media* (Cambridge: MIT Press, 2016), p. 2.

34 D. Olson, *The World on Paper: The Conceptual and Cognitive Implications of Writing and Reading*, p. 260.

tingly cultivating through our incessant typing, clicking, swiping and tapping on screens? A route following on from this discussion may be provided by digital humanities researcher Johanna Drucker, whose 2014 monograph *Graphesis: Visual Forms of Knowledge Production* critically examines what the ubiquity of screens, digital images, information graphics, and graphical user interfaces actually means for the human pursuit of knowledge and understanding.<sup>35</sup> Undoubtedly, further neurological and psychological studies need to be completed in this area, and their results ought to be followed closely by humanists and scientists, writers and artists alike. As the old word-image antagonism begins to dissolve, the distinction and conceptual separation between the two modalities still remains palpable and useful. For now, it is primarily the field of data science that may be too quick to drive forward their total convergence. Confronted with large collections of digital material, 21st century humanists need to recognise their role in retaining a differentiated treatment of images and texts, and in appropriately managing their hybridity wherever it arises.

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35 See J. Drucker, *Graphesis: Visual Forms of Knowledge Production* (Cambridge, Massachusetts: Harvard University Press, 2014).



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</chapter 6>

## Peer-Learning and Learning Experience in the Historical Language Classroom: Teaching Old English in the Digital Age

*Berber Bossenbroek*

In an era of rapid digitisation, the transmission of information has changed fundamentally. New media possibilities such as livestreaming, online videos and chat applications have both accelerated the transmission of information and increased its ubiquity. This changing information structure has brought about changes in the classroom, too: the time when students sat in straight rows, performing repetitive tasks under the close supervision of the teacher, has passed. Nowadays, teachers are recommended to tailor learning experiences to the needs of individual students and to present students with materials more interactive in nature while continuing to engage with current developments in the field. For such purposes, digital tools constitute an invaluable aid. In this paper, I will explore how such digital tools can be used for the teaching of Old English, the language spoken in early medieval England (ca. 450–1100).

Old English has steadily been increasing in popularity: teachers have used such media as J.R.R. Tolkien's *The Lord of the Rings* and TV series inspired by the Middle Ages to lure students to the Old English classroom, thereby providing the subject with an unprecedented popularity boost. This advent of the popularity of Old English is reflected by the veritable boom in teaching materials of the past decade, with about one new method per year appearing on the subject.<sup>1</sup> Each of these methods in turn addresses questions such as 'should students memorise every nominal or verbal paradigm?'; 'how does one get students to engage in the exercise of translation while most translations are floating about freely online?'; and, perhaps most importantly, 'how do we keep students engaged with a topic and field that is increasingly marginalised in university budgeting?'. While each method deals with these questions in one way or another, each one offers different answers. With this paper, I hope to

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1 A. Scheil, 'Old English Textbooks and the 21st Century: A Review of Recent Publications', *Old English Newsletter*, 40 (2007), pp. 47–59.

contribute to the wide and complex answers of questions such as these, specifically against the backdrop of the rapidly developing e-learning infrastructure of the past decade. I will explore how teachers of Old English can respond to both the increased popularity of the subject—and, with that, increased class sizes—as well as to the shifting digital information infrastructure. In particular, I will suggest two ways in which the teaching of Old English can incorporate online peer-learning and personalised learning to its advantage. In doing so, I will explore the crucial role that both peer-learning and personalised learning have in digital teaching. In short, this paper explores how to keep all aspects of Old English education fresh and relevant for a new, diverse, digital age.

## 1 The Development of E-learning

Fifteen-or-so years after the advent of e-learning, almost every school or university offers online content of some sort. Tools used to support e-learning come in a wide variety of forms; they include, for instance, discussion forums, instructional videos, recorded lectures and file sharing. Different tools support different elements of the learning process, and one of the key questions in organising an e-learning platform has been whether to keep such different tools separate, or to integrate them into a single platform.<sup>2</sup> Combining tools comes with the potential drawback of having to conform to the software used to organise them, while keeping tools separate runs the risk of them being difficult to locate and may cause mismatches or overlap between different tools. Currently, the bulk of universities around the globe use learning management systems (LMSs) to organise digital teaching tools; platforms that integrate different tools into a single system that organises and manages them.<sup>3</sup>

The rapid uptake of university-wide LMSs has expanded them into a million-dollar business, with the bulk of universities around the globe having adopted either WebCT or Blackboard LMS as early as 2005.<sup>4</sup> Recently, however, the use of integrated LMSs has come under question because while they are useful tools

2 J. Sandrock and H.T.K. Vo, 'E-Learning community integration with Web Services', *Procedia Computer Science*, 92 (2016), pp. 155–160.

3 C. Dalsgaard, 'Social software: E-learning Beyond Learning Management Systems', *European Journal of Open, Distance and E-Learning*, 12 (2006).

4 H. Coates, R. James and G. Baldwin, 'A Critical Examination of the Effects of Learning Management Systems on University Teaching and Learning', *Tertiary Education and Management*, 11 (2005), pp. 19–36 (p. 21).

for organising course content, student participation is often limited by these platforms.<sup>5</sup> Indeed, Niall Sclater has observed that the very term learning *management* system suggests disempowerment on the part of students; learning is framed as something that is controlled by the university, not as a process that students can actively shape themselves.<sup>6</sup> Stephen Powell has suggested that the primary use of LMSS as storage spaces for materials such as lecture notes and PowerPoint Slides, rather than as spaces where students can interact with each other and share knowledge and ideas, creates a culture of dependency where students learn what the course content feels they must, but nothing more.<sup>7</sup>

While LMSS often restrict the learning process to integrated tools, it is not surprising that students do not merely interact with the content that is published on their designated LMSS. Although frequently, the only content that students are required to create themselves are class essays, exams, and other written assignments, the majority of students creates content on different platforms, such as Instagram, Snapchat, YouTube, or WhatsApp. While thirty years ago, the Web was a space where content was merely accessed and read, the past decade has seen a rapid shift from this 'read Web' to a 'read/write' Web: a Web where anyone can create content at any time, at any platform of their choice.<sup>8</sup> Another term that is commonly used to denote the 'read/write Web' is 'Web 2.0', however, this term is notoriously unclear, as it suggests a clear break between the 'read Web' (Web 1.0) and the 'read/write Web' (Web 2.0). However, assuming such a clear break between the read and read-write Web is misguided; the transition from one to the other is just that: a gradual transition rather than a break.<sup>9</sup>

With the expanded possibilities for online content creation has come an increasingly blurred distinction between formal and informal learning spaces. Formal learning spaces denote traditional learning environments such as classrooms, whereas informal learning spaces can be any environment in which students learn that is not regulated by formal educational institutions. Examples

5 N. Sclater, 'Web 2.0, Personal Learning Environments, and the Future of Learning Management Systems', *EDUCAUSE Centre for Applied Research: Research Bulletin*, 13 (2008), pp. 2–13.

6 N. Sclater, 'Web 2.0, Personal Learning Environments, and the Future of Learning Management Systems'.

7 S. Powell, 'Personal Learning Environments Experts Meeting', *Thoughts Mostly about Learning*, 14 June, 2006. <https://stephenp.net/>.

8 R. Hall, 'Towards a Fusion of Formal and Informal Learning Environments: The Impact of the Read/Write Web', *Electronic Journal of e-Learning*, 7 (2009), pp. 29–40.

9 S. Murugesan, 'Understanding Web 2.0', *IT Professional*, 9 (2007), pp. 34–41.

of informal learning spaces are, for instance, informational videos on YouTube, or facts learned over WhatsApp, Instagram, or Snapchat. With the advent of online content creation, students can, for instance, confer over assignments via a wide variety of media, turn their essays into blogpost or tweets, or create YouTube videos designed to help other students grasp certain materials. Strictly differentiating between formal and informal learning spaces is notoriously difficult, because in any learning situation, elements from both informal and formal learning will be present.<sup>10</sup> The abundance of digital learning methods and network technologies has created a learning ecosystem that is both intensely varied and intensely tangled, rendering distinguishing between informal learning spaces even more difficult.<sup>11</sup> In short, students do not merely learn in a designated formal learning space; learning also takes place outside of the classroom in a myriad of ways spurred by (digital) content creation. While the rapid advance in students' use of digital technology has led to a change in learning, e-learning software has not always kept up with this change.

Indeed, besides the critique levelled at LMSS' tendency to offer students reading content but little opportunity to create their own, the way in which universities have been using LMSS has been criticised as well. In higher education, digital tools are predominantly viewed as supplements or adjuncts to the regular curriculum, rather than as learning environments in their own right. This approach to digital tools has been referred to as their being used in 'adjunct mode' and is still the most common use of digital tools in university education.<sup>12</sup> However, the manifold critiques levelled at this approach are slowly becoming more influential; increasing numbers of universities offer e-learning spaces where the digital environment takes precedence such as MOOCs (Massive Open Online Courses), which have rapidly been gaining in popularity over the last ten years.

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10 A. Manuti et al., 'Formal and Informal Learning in the Workplace: A Research Review', *International Journal of Training and Development*, 19 (2015), pp. 1–17 (p. 12).

11 M.J. Cox, 'Formal to Informal Learning with IT: Research Challenges and Issues for E-learning', *Journal of Computer Assisted Learning*, 29 (2013), pp. 85–105.

12 L. Harasim, 'A History of E-learning: Shift Happened', in J. Weiss et al. (eds.), *The International Handbook of Virtual Learning Environments* (London: Palgrave MacMillan, 2006), pp. 59–94 (pp. 63–65).

## 2 E-learning and Old English

The move towards online learning spaces is gradually becoming reflected in the field of Old English studies as well, with the bulk of manuscripts from institutions such as the British Library now being accessible online, and open-access platforms such as “Old English online” rapidly expanding in both content and number of users. However, while such developments are encouraging, the field of Old English studies is only just beginning to engage with digitisation, and there is still a long way to go. In what follows, I will briefly explore a few ways in which teachers of Old English can use digital tools to improve and diversify the teaching of Old English. Unfortunately, a full set of recommendations would require more space than this paper allows for. As such, the following will be an exploratory section on which, hopefully, future studies can build.

Traditionally, the Old English curriculum can be said to comprise four main elements: translation, vocabulary, grammar, and literary and cultural history.<sup>13</sup> One of the major difficulties for teachers of Old English—or any language for that matter—is that different students move at different paces when it comes to learning vocabulary, grammar, and translation skills. When these skills are taught in a classroom environment, teachers are forced to move at an average pace, which may be too fast for some students, but too slow for others.<sup>14</sup> Digital tools provide a solution to this problem: when students are offered their exercises digitally, they can go through them at their own pace and repeat certain parts however many times they want. Teachers of Old English would benefit greatly from a platform that offered students the opportunity to either make use of extra explanatory exercises on topics they have difficulty with, or to select advanced exercises on topics that they find interesting and wish to pursue further. Such individualised exercises allow for much greater classroom differentiation than in-class teaching ever will be able to.<sup>15</sup>

Another way in which both Old English teachers and students can benefit from a digital learning environment is through the opportunities such an environment provides for training in peer review. Peer review is a near invaluable skill for any Old English (under)graduate student to acquire. Whether a

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13 For example, see P. Baker, *Introduction to Old English* (3rd ed.) (Oxford: Wiley Blackwell, 2012).

14 J. Heller et al., ‘Competence-based Knowledge Structures for Personalised Learning’, *International Journal on E-learning*, 5 (2006), pp. 75–88.

15 N. Dabbagh and A. Kitsantas, ‘Personal Learning Environments, Social Media, and Self-Regulated Learning: A Natural Formula for Connecting Formal and Informal Learning’, *Internet and Higher Education*, 15 (2012), pp. 3–8.

student decides to pursue a career in academia or elsewhere, the ability to provide sound and useful feedback is a skill that will benefit students in all manner of ways.<sup>16</sup> The main skill under training is elaborating on just why certain elements of a piece under scrutiny should be assessed positively or negatively, which both affords students the opportunity for multiple assessments of their work, as well as develop their critical thinking skills.

While highly useful, incorporating this particular skill into the Old English curriculum can be difficult, as none of the traditional elements of the subject encompass peer review. I would like to propose that a natural and accessible way to introduce students of Old English to providing their peers with feedback is through the medium of anonymised translation exercises. Of the traditional four areas of study of Old English, translation is the most suitable one through which to introduce students to peer review, as, in translation, there is often not one 'right' answer, but several justifiable alternatives.<sup>17</sup> This subjectivity of translation makes sure that the feedback concerns more than just factual corrections, and will therefore train students in elaborating on their feedback. When the translations students are required to review are anonymised, the problem of emotionally charged feedback is eliminated.<sup>18</sup> When students are regularly tasked with providing feedback on the translations of their peers and the feedback itself is in turn evaluated by the teacher, students can practice their feedback skills, as well as receive expert guidance from their educator. Furthermore, such a system also allows students to practice incorporating feedback into their work, as well as justifying why they did or did not accept certain suggestions.

Facilitating the introduction of such student-centred teaching tools necessitates looking beyond the established LMSS to platforms that are more interactive in nature, and better suited to allowing students to work at their own pace. Recent years have seen the introduction of Learning Experience Systems (LESS) which can offer exercises tailored to students, pedagogical games, and a wide variety of options in student-driven content creation.<sup>19</sup> Aside from the diversity of learning environments they provide, LESS provide excellent opportunities for peer-learning. Students learn not only from their teacher, but also from each other in for instance study groups, feedback given on each other's

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16 L. Nilson, 'Improving Student Peer Feedback', *College Teaching*, 51 (2010), pp. 34–38.

17 S.J. Levine, 'Translation as (Sub)version: On Translating Infante's *Inferno*', *SubStance*, 13 (1984), pp. 85–94.

18 L. Nilson, 'Improving Student Peer Feedback'.

19 D. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (New Jersey: FT Press, 2014).



work, or in collaborative projects. When students are actively encouraged to work together, they develop organisational and planning skills, as well as giving and incorporating feedback. When students learn together, they learn more effectively, and they gain considerable practice in collaborative skills as well.<sup>20</sup> As such, peer learning as an educational strategy has been around for years but could be hitting its stride with the broad introduction of digital devices.

Of course, shifting away from LMS's towards LES's requires time and resources. A platform that could include such recommendations as have been made in this paper will in all likelihood take some time to develop. However, as I hope to have demonstrated in this paper, continuing to use outdated resources will only keep students from achieving their full potential, and only serves to limit the opportunities that digital education so aptly provides. In short, rethinking how information is offered and processed has become more necessary than ever for those working in digital education. In a world that provides so many opportunities for content creation and consumption, education should be a frontrunner, rather than the one trailing behind.

### 3 Conclusion

The approach outlined above that aims to integrate e-learning and Old English necessitates a focus on students, providing them with tools to support both their individual and collaborative activities. Such a student-centred approach benefits from a perspective that encourages students' autonomy, rather than one based on merely the management of learning and student activity, as LMSs tend to do. An approach focused on empowering students to manage their own education necessitates a fundamental shift in educators' thought from managing students' learning to providing them with tools not only for the acquisition of independent skills, but also for reflection and collaboration with others. However, such tools, if they have been developed yet, are scattered around between different disciplines, which means that a directed effort is necessary to bring together all elements of personalised learning into a single software platform. Learning Experience Systems provide the perfect platform for such an effort, as these present the necessary balance between teachers' learning management and students' self-directed learning efforts. The development of new e-learning tools for the teaching of Old English—as well as for (historical)

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20 D. Boud, 'Introduction: Making the Move to Peer Learning', in D. Boud, R. Cohen, and J. Sampson (eds.), *Peer Learning in Higher Education: Learning From and With Each Other* (London: Routledge, 2001), pp. 1–20.

languages more broadly—combined with the growing popularity of the subject will ensure that Old English teaching is ready for the next generation of students.

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Scheil, A., 'Old English Textbooks and the 21st Century: A Review of Recent Publications', *Old English Newsletter*, 40 (2007), pp. 47–59.

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</chapter 7>

## Third Party Terrorists or Unmissable Middlemen? Kobo and Kindle on the Dutch E-book Market

*Laurie Bastemeijer*

When e-reading was first introduced in The Netherlands, few people believed it would be more than a fad. Most publishers did not expect the medium to gain serious ground, and readers were skeptical too.<sup>1</sup> In the early years, there were almost no Dutch-language e-books available, and the price difference between digital or a print copy was barely worth the hustle.<sup>2</sup> On top of that, e-readers were still a rather exclusive technology that not everyone could afford.

A decade later, Dutch readers nonetheless seem to have embraced the book in its digital format, and the percentage of e-book readers is growing steadily. While Dutch paper books faced a decline in revenue in the 2010's, e-books were on the rise.<sup>3</sup> This trend has also largely been stimulated by the increasing supply of e-books, e-reading services and e-readers. The process of buying and downloading e-books was simplified and prices of e-reading devices have drastically dropped. For example, within ten years, the amount of available Dutch-language e-books on retail website Bol.com grew from two thousand to almost fifty thousand. E-books are now on sale for a considerably lower price than the paper version, and subscription and e-lending services are making e-reading even more affordable.

It is therefore no surprise that digital reading has become more alluring for individual readers. The comfort they experience when reading an e-book today is the result of time and money spend in the development of e-reading devices and services. Many of these innovations do not have their roots in the publishing field. They are the creations of leading retail companies and internet giants like Amazon and Kobo Rakuten Inc. These companies have

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1 N. Lamers. *Five Years On: Continuing challenges for the Dutch e-book market*. MA thesis (Leiden: Leiden University, 2014) pp. 32–38.

2 Idem. pp. 32–34.

3 'Verkoop e-books' *KVB Boekwerk*. 19 November 2018. <https://www.kvbboekwerk.nl/monitor/markt/verkoop-e-books> (14 January 2020).

helped get the e-book market on its feet, but they have also created empires for themselves along the way.

The e-book monopoly of retail giants has so far caused serious problems on the American market. Amazon has gained notoriety for selling its e-books below cost price, as well as for suing and practically blackmailing publishers who refused to accept its business model.<sup>4</sup> The American co-operation between publishers and Amazon has been anything but spotless, and publishers usually cannot afford to pull their collection from the retail website. This has legitimised a fear that occupies the publishing world: many publishers (and booksellers) believe that the e-book entrepreneurs have gained too much control over the market. It leaves publishers vulnerable to these retail giants' every whim.

Problems with e-retailers have not gained such disastrous proportions in The Netherlands, but Dutch publishers are also quite vulnerable to malpractices, especially since retail giant Bol.com has partnered with Kobo.<sup>5</sup> It raises the question of whether this dependency on a few gigantic e-retailers is simply unavoidable, or if Dutch publishers could make these third parties a little less powerful.

## 1 The Dutch Digital Reader

The first e-reader to be offered in the Netherlands was the cumbersome Sony Data Discman, which entered the Dutch market in 1994.<sup>6</sup> The fifteen years of e-book trials that followed were filled with various clumsy devices. One after the other failed to become successful with a wider audience, mostly due to high prices and the limited amount of e-books available. In 2009, however, Sony joined forces with national online retail giant Bol.com and the Dutch audience caved. For the first time, Dutch audiences could read e-books on a relatively affordable, advanced e-reading device (the Sony Touch Edition was sold for 299 euros, the Pocket Edition for 199 euros). Over two thousand Dutch and many

4 C. Robinson. 'The Trouble With Amazon'. *The Nation*. 15 July 2010. <https://www.thenation.com/article/trouble-amazon/>. (12 January 2020).

5 'Bol.com en Kobo slaan handen ineen en realiseren doorbraak in ontwikkeling digitaal lezen' *Bol.com*. 15 September 2014. <https://pers.bol.com/alle-persberichten/bol-com-en-kobo-slaan-handen-ineen-en-realiseren-doorbraak-ontwikkeling-digitaal-lezen/> (11 January 2020).

6 J. Bouwmans. 'De e-Reader is 25 geworden' *INCT*. 12 March 2019. <https://inct.nl/news/6574/de-e-reader-is-25-geworden> (10 January 2020).

more English titles were now readily available through a web retailer people were already familiar with.<sup>7</sup> And that was only the beginning.

Since that first Sony Touch, the amount of Dutch e-book readers has continuously expanded. By 2014, the percentage of Dutch people reading e-books exceeded that of American readers, whose e-book market began to establish itself in 2007.<sup>8</sup> The expansion was not restricted to the audience: revenue, albeit slowly, has increased over the past years as well.<sup>9</sup> It must per contra be noted that in the Netherlands, the sales total of e-books still remain far behind that of the paper book.<sup>10</sup>

The early e-books offered on the Dutch market were generally EPUB files and at times even PDF's. These files were usually made available through Adobe DRM software, a necessity to protect publications against piracy.<sup>11</sup> Nevertheless, Adobe DRM proved (and still proves) to be a problem for consumers. To open purchased e-files, readers are required to install the Adobe software, which is notorious for its errors. This also makes switching between accounts or devices near impossible, an issue that has led to many complaints.<sup>12</sup> From the customer's perspective, it is thus hardly surprising that alternative e-reading services have been gaining ground. In the Netherlands, Kobo devices and Amazon's Kindles are especially popular. E-reading services for multi-purpose devices, such as Apple Books and Google Play Books, are also used, but they will not be discussed in depth in this essay.

## 2 Online E-book Retail and the Publishing Industry

Since it first laid its foundation, publishers have found the e-book market a troublesome one. The financial side of e-book publishing has proven to be

7 A. de Groot 'E-reader heeft eigenlijk maar erg weinig nadelen'. *De Volkskrant*. 17 September 2009. <https://www.volkskrant.nl/cultuur-media/e-reader-heeft-eigenlijk-maar-erg-weini-g-nadelen~b0997acd/> (10 January 2020).

8 'Leesgedrag e-boeken'. *Leesmonitor* 2020. <https://www.leesmonitor.nu/nl/leesgedrag-e-boeken#aantal-digitale-lezers-groeit> and A. Watson. 'Share of adults who have read an e-book in the last 12 months in the United States from 2011 to 2019' *Statista*. 9 October 2019. <https://www.statista.com/statistics/237070/frequency-of-reading-e-books-on-an-ebook-reader-in-the-united-states/> (10 January 2020).

9 'Verkoopcijfers 2018' *KVB Boekwerk*. 17 January 2019. <https://www.kvbboekwerk.nl/monitor/markt/monitor-2018-verkoopcijfers-2018> (10 January 2020).

10 'Boekenvak'. *Leesmonitor* 2020. <https://www.leesmonitor.nu/nl/boekenvak> (10 January 2020).

11 N. Lamers. *Five Years On: Continuing challenges for the Dutch e-book market*. pp. 61.

12 S. Vrijdag. 'Wat is DRM?' *Consumentenbond*. 19 February? 2019. <https://www.consumentenbond.nl/e-reader/wat-is-drm> (11 January 2020).

tricky. In 2010, various prominent figures in the Dutch book trade already mentioned that the advancements in the e-book market were hard to keep up with and that finding a profitable economic model posed a problem.<sup>13</sup> Despite the expanding enthusiasm for e-reading amongst consumers, many of these issues seem as relevant today as they seemed a decade ago, and new ones have arisen.

In the beginning of the 2010's, Dutch publishers had different concerns than they have now. The benefits of the e-book had to be marketed to a limited group of early adopters, online piracy was out of control. It was difficult to find an economic model in which e-books would become a profitable investment at a cheap enough price to remain attractive for customers.<sup>14</sup> Some of these issues are still relevant, while a new and arguably more problematic challenge might be found in the aforementioned increasing monopoly inflicted on the (e-)book market by retail giants.

Complaints about monopolizing retailers in the literary sphere are not at all limited to e-books. For decades, publishers and booksellers have been struggling to compete with price-cutting department stores, which, due to the revenue they made on other products, could afford to make less profit per book.<sup>15</sup> In the Netherlands, unfair competition on printed books is limited because of the fixed book price and, prior to that, because of regulated book prices. The Dutch e-book, on the other hand, is not protected by a fixed price. Luckily, the Netherlands welcomed the international e-retailers a few years after Amazon became the main e-book retailer of the United States. It has granted Dutch publishers the opportunity to learn from the mistakes of American colleagues. The Dutch contracts allow publishers to set the sales price for e-books on both Amazon and Kobo.<sup>16</sup> Most new Dutch e-books on Kobo and Amazon are sold at a price between ten and fourteen euros, and the average e-book price has been around nine euros in the past years.<sup>17</sup> It is interesting to see if pricing will

13 V. de Kok. 'Ook de uitgevers ontkomen niet meer aan het e-boek'. 6 October 2010. <https://www.volkskrant.nl/nieuws-achtergrond/ook-de-uitgevers-ontkomen-niet-meer-aan-het-e-boek-uitgelicht-uitgelicht-de-week-van-de-geschiedenis-krant-nederland-en-de-zee-zaterdag-bij-de-krant~bfbbfbc9/> (10 January 2020).

14 Lamers, N. *Five Years On: Continuing challenges for the Dutch e-book market*. pp. 9–10.

15 L.J. Miller. *Reluctant Capitalists: Bookselling and the Culture of Consumption* (Chicago: University of Chicago Press, 2006). pp. 38.

16 J. Kraan. 'Amazon komt naar Nederland met e-books en e-readers.' *NU.nl*. 11 November 2014. <https://www.nu.nl/internet/3926127/amazon-komt-nederland-met-e-books-en-e-readers.html> (14 January 2020).

17 'Verkoop e-books' *KVB Boekwerk*. 19 November 2018. <https://www.kvbboekwerk.nl/monitor/markt/verkoop-e-books> (14 January 2020).

become more competitive now that the Dutch government has lowered the tax on e-books (from twenty-one to nine percent as of 2020).<sup>18</sup>

Compared to the situation in the United States, it is clear that Dutch publishers did not end up with the worst possible deal. In the States, Amazon has become notorious amongst publishers for its price-cutting and for the way in which the company achieves its business goals. Publishers unwilling to cooperate with them have previously seen their titles removed from the website and have even been dragged into lawsuits to pay settlements they could barely afford.<sup>19</sup> As Amazon sells e-books for around a third of the price of the publishers' physical editions, the book market cannibalises itself: e-books become so attractive they lure customers away from the print book.<sup>20</sup> This would not be an issue in itself, if the e-books were fairly priced and the publisher could make a comparable profit. However, Amazon sells e-books under break-even point, and the publisher still has to pay a commission fee.<sup>21</sup> Obviously, this leads to little revenue per title, while publishers, editors, authors and designers still have to be paid. It is unsurprising that the attitude towards Amazon has become rather hostile over the years. The issue is that *not* offering e-books of Amazon is not a viable solution either, as there simply is no alternative.

This is a risk that Dutch publishers also face. A lack of alternative channels puts publishers in a critical position, where little leverage remains to counter the third parties if needed. Amazon and Kobo might have behaved rather decently in The Netherlands so far, but it is questionable whether their models will actually be viable in the long run.

### 3 Kobo

The Canadian e-book provider Rakuten Kobo Inc., usually simply referred to as 'Kobo', was founded as an e-reading service in 2009, but got a major impulse when it started to produce its own electronic devices to offer these services on. Kobo e-readers are cheap, have extensive battery life, Wi-Fi, and a built-in

18 'Boeken'. *Belastingdienst.nl*. [https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/btw/tarieven\\_en\\_vrijstellingen/goederen\\_9\\_btw/boeken\\_en\\_periodieken/boeken/boeken](https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/zakelijk/btw/tarieven_en_vrijstellingen/goederen_9_btw/boeken_en_periodieken/boeken/boeken) (12 January 2020).

19 K. Gessen. 'The War of the Words'. *Vanity Fair*. 6 November 2014. <https://www.vanityfair.com/news/business/2014/12/amazon-hachette-ebook-publishing> (12 January 2020).

20 H. Li. 'Dynamic Demand and Pricing Strategy in the EBook Market'. 1 January 2015. *Publicly Accessible Penn Dissertations*. 1087. <http://repository.upenn.edu/edissertations/1087>. pp. vi.

21 C. Robinson. 'The Trouble With Amazon'. *The Nation*. 15 July 2010. <https://www.thenation.com/article/trouble-amazon/>. (12 January 2020).



e-store, which makes uploading e-books to the device easy for even its less tech-savvy users.<sup>22</sup> The company started up in the Netherlands in 2012 and became a partner of Bol.com two years later, merely weeks after Bol ended its collaboration with Sony.<sup>23</sup> Since 2017, they have cooperatively been offering a monthly subscription service called Kobo Plus. The service allows readers to read any amount of e-books they want at a set monthly price of 9,99 euros. The service gained almost 100.000 paying members within the first year.<sup>24</sup> Today, five out of the top ten most sold e-readers at major retailer Coolblue are Kobo's.<sup>25</sup>

Kobo has not received negative criticism to the extent Amazon has. This might have to do with the fact that Kobo is an e- and audio book specialist instead of a multi-faceted retailer, but could also be a result of their market strategy. Kobo often forms partnerships with or buys existing local e-book retailers (like Waterstones, Bol.com, the German Tolino etc.) and in that process typically keeps an eye out for local customs and demands.<sup>26</sup>

Kobo is also more friendly towards its customers. Readers can add most e-book formats to their Kobo library, even when these have been bought at another retailer, and the Kobo Plus service can be used on devices by other manufacturers. However, readers are naturally still discouraged to do either. Directly downloading books via the built-in Kobo Store is obviously favourable over the more challenging task of transferring e-books to the device via your computer, using the dreaded Adobe DRM software.

#### 4 Amazon

Amazon and its Kindle offer a similar product, namely affordable and user-friendly e-readers with a large amount of cheap available books, that can easily be downloaded on the device. However, Kindle devices cannot read EPUB files,

22 M. Weilage. 'Geek Gifts 2010: Kobo eReader'. *TechRepublic*. 21 November 2010. <https://www.techrepublic.com/blog/geekend/geek-gifts-2010-kobo-ereader/> (12 January 2020).

23 'Bol.com en Kobo slaan handen ineen en realiseren doorbraak in ontwikkeling digitaal lezen' *Bol.com*. 15 September 2014. <https://pers.bol.com/alle-persberichten/bol-com-en-kobo-slaan-handen-ineen-en-realiseren-doorbraak-ontwikkeling-digitaal-lezen/> (11 January 2020).

24 'Kobo Plus: na één jaar 125.000 lezers'. *Boekblad*. 27 February 2018. <https://boekblad.nl/Nieuws/Item/kobo-plus-na-een-jaar-125000-lezers> (11 January 2020).

25 'Top 10 Bestverkochte e-readers' *Coolblue*. <https://www.coolblue.nl/e-readers/top-10> (12 January 2020).

26 M. Kozłowski. 'The History of Kobo and how they changed the e-reader market.' *Good E Reader*. 7 August 2020. <https://goodereader.com/blog/electronic-readers/the-history-of-kobo-and-how-they-changed-the-e-reader-market> (13 January 2020).

which makes Amazon's service more restrictive than Kobo. This setback is hard to overcome in a legal manner, so most readers with Kindles are inclined to purchase their e-books via Amazon.<sup>27</sup>

Since 2014, Amazon has thousands of Dutch titles on offer next to their existing collection of millions of English e-books. Due to the aforementioned contracts both services uphold with Dutch publishers, there appear to be few financial benefits to choose Kindle over Kobo. Only ardent readers with a Kobo Plus subscription can read at significantly lower prices. Amazon has not yet installed its competing subscription service, Kindle Unlimited, in the Netherlands. Amazon does, however, have a much larger amount of (cheap) English-language books. For Dutch readers, who are known to read in English fervently, this might be a consideration for choosing Kindle.<sup>28</sup>

Overall, the user comfort of the services and affordable, but high-quality devices of Kobo and Kindle make both parties attractive to consumers. These third party e-reading services develop quickly and allow readers to acquire a gigantic selection of titles with ease. Nevertheless, many publishers still have their concerns about these developments.

## 5 The Main Problems for Dutch Publishers

Both Kindle and Kobo have clear contracts regarding prices, which prevent harmful price cuts.<sup>29</sup> For individual e-books, the problems possibly do not outweigh the benefits of third party services, which will be discussed in the next section. Still, concerns regarding e-reading remain legitimate amongst Dutch publishers. A major issue is finding the perfect economic model to make it profitable for all parties involved.

The business models behind unlimited e-reading services like Kobo Plus are especially precarious. Giving readers the option to read multiple books for ten euros a month sounds like a publisher's worst nightmare. Streaming services are not necessarily unprofitable. The subscription model they employ has the

27 S. Segan. 'How to Put Free Ebooks on Your Amazon Kindle'. 17 December 2018. <https://www.pcmag.com/news/334440/how-to-put-free-ebooks-on-your-amazon-kindle> (11 January 2020).

28 'Boekenvak'. *Leesmonitor* 2020. <https://www.leesmonitor.nl/nl/boekenvak> (12 January 2020).

29 T. van der Kolk. 'Amazon opent Nederlandse site voor e-books en e-readers.' *De Volkskrant*. 11 November 2014. <https://www.volkskrant.nl/wetenschap/amazon-opent-nederlandse-site-voor-e-books-en-e-readers~b2da5239/> (12 January 2020).

benefit that it often leads to recurring revenue. Cheap subscription services can seduce one-time buyers into becoming recurrent buyers, and their set monthly contribution leads to a more stabilized income for companies.<sup>30</sup> Most subscription services assume that the ardent behaviour of a few zealous consumers is balanced out by the many consumers that play even or pay for more than they utilize. However, this theory has proven to be tricky for e-reading models. In the Netherlands, the people who buy e-readers often read more than the average person.<sup>31</sup> This tendency is prevalent, and has, for example, been a source of trouble for English-language e-reading service Scribd. This company had to alter its business model as a result.<sup>32</sup>

This leads to the biggest issue with Kobo Plus and e-books in general, and that is the lack of a functioning business model. A simplified structure of traditional publishing is shown in figure 1.<sup>33</sup> Naturally, not every print book is a success. A publisher might still make mistakes by overestimating the required print run, or can sell a title for an insufficient amount. Nevertheless, publishers are familiar with the sales process, aware of the costs of a publication and they know how much of the stock has to be sold in order to make a profit.

This logical structure disappeared in the sale of unlimited e-reading services, where the publisher's income does not mirror the sales per book, but is dependent on the amount of subscribers. The Kobo Plus model is quite complex. The total income out of all subscriptions over a certain period of time are divided by the amount of e-books that have been read in that same period. Then, a remittance is paid by Kobo based on how often a certain title is read and on the regular price of that title. Of the total amount, seventy-five percent goes to the publisher and twenty-five percent is given the author of a book.<sup>34</sup>

30 C. Linz et al. *Radical Business Model Transformation: Gaining the Competitive Edge in a Disruptive World*. (London: Kogan Page, Limited, 2017).

31 "Leesgedrag e-boeken" *De Leesmonitor* 2020. <https://www.leesmonitor.nu/nl/leesgedrag-e-boeken#aantal-digitale-lezers-groeit> (13 January 2020).

32 'Abonnementsdienst Scribd wijzigt opnieuw verdienmodel'. *Ereaders*. 7 February 2018. <https://www.ereaders.nl/abonnementsdienst-scribd-wijzigt-opnieuw-verdienmodel/> (13 January 2020).

33 A. van der Weel. 'From value chain to value network.' [http://www.let.leidenuniv.nl/wgbw/research/Weel\\_Articles/ValueChainToValueNetwork.pdf](http://www.let.leidenuniv.nl/wgbw/research/Weel_Articles/ValueChainToValueNetwork.pdf) (14 January 2020).

34 C. Hoffscholte. 'Goudmijn of habbekrats? Inkomsten uit abonnementsdiensten punt van discussie.' *Boekblad*. 26 February 2020. <https://boekblad.nl/Magazine/Artikel/goudmijn-of-habbekrats-inkomsten-uit-abonnementsdiensten-punt-van-discussie> (14 January 2020).



FIGURE 1  
The traditional book value chain (A. van der Weel)

The twenty-five biggest Dutch publishers have all made their books available in Kobo Plus.<sup>35</sup> Neither publishers, nor the retail parties give any insight about the commission fees publishers pay to be part of the service. In the past, Bol.com has been severely criticised for the high commission rates it asks to put paper books on their website, and it seems unlikely that publishers would not pay a considerable sum to be featured on Kobo Plus.<sup>36</sup> Commission fees or overall low promises for revenue on e-books might prevent smaller or independent publishers from joining.

Another issue that arises from this economic model is the limited and uncertain sum reserved for authors. The Dutch Union for Authors (Auteursbond) is already pushing the authors' agenda in e-book sales.<sup>37</sup> If nothing changes, authors might attempt to change their own fate, either by looking for new publishers, or by adopting the increasingly attractive alternative of self-publishing. If an author could get paid up to seventy percent of their revenue with a book directly published via Kobo or Amazon, the mere twenty-five percent via the publisher seems inadequate.<sup>38</sup>

35 M. Dessing, 'Samen met uitgevers innoveren is 'superbelangrijk'. Tien jaar digitaal lezen bij Bol.com' *Boekblad*, 22 November 2019. <https://boekblad.nl/Magazine/Artikel/samen-met-uitgevers-innoveren-is-superbelangrijk--tien-jaar-digitaal-lezen-bij-bolcom> (14 January 2020).

36 C. Hoffscholte, 'Goudmijn of habbekrats? Inkomsten uit abonnementsdiensten punt van discussie.' *Boekblad*, 26 February 2020.

37 Ibid.

38 'Publiceer gratis e-books en paperbacks in eigen beheer met Kindle Direct Publishing en bereik miljoenen lezers op Amazon.' *Amazon*. [https://kdp.amazon.com/nl\\_NL/](https://kdp.amazon.com/nl_NL/) (14 January 2020).

These conflicts between e-reading subscription services and publishers are not limited to Kobo Plus. The beginning of e-lending through public libraries has caused similar issues, and e-lending models have been criticised and adapted various times in the past.<sup>39</sup>

## 6 Benefits

To say that e-retailers have brought nothing but doom would be unfair. Before the introduction of Kobo Plus, the price of both e-readers and e-books was a threshold for many readers. The perceived value of e-books is lower than those of paper books, but the prices of e-books did not match this lower perceived value.<sup>40</sup> Many readers were unwilling to pay for e-books, and instead chose to illegally obtain them. Therefore, one of the goals expressed by Bol.com and Kobo was to attract new customers who had previously been illegally downloading e-books to Kobo Plus. This was not an unrealistic ambition; the arrival of affordable music streaming services had this effect on music piracy in The Netherlands.<sup>41</sup> The assumption is that Kobo Plus has gained similar results with e-book piracy and has managed to herd some people away from digitally stealing e-books, a crime that obviously left the publisher with no profit at all. Kobo and Bol.com defend this theory with the fact that half of Kobo Plus' subscribers had never bought individual e-books from them before.<sup>42</sup>

## 7 Alternatives

As previously discussed, being featured on a third party e-reading service costs quite some money, but it does not result in financial security. Because of that, it is more attainable for publishers with deeper pockets. The monopoly of the retailers therefore raises concerns about growing homogeneity in the book

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39 C. Hoffscholte. 'Goudmijn of habbekrats? Inkomsten uit abonnementsdiensten punt van discussie.'

40 A. van der Weel, 'E-roads and i-Ways: a sociotechnical look at user acceptance of e-books', *LOGOS* 21/3 2010. pp. 49.

41 'Global Online Piracy Study' *Institute for Information Law*. (Amsterdam: University of Amsterdam, 2018). pp. 27.

42 M. Dessing, 'Samen met uitgevers innoveren is 'superbelangrijk'. Tien jaar digitaal lezen bij Bol.com' *Boekblad*. 22 November 2019.

field, as it seems to put independent publishers at more risk. How can publishers secure their position on the e-book market in the future? If Amazon or Kobo were to change their mind about their business models and become less accepting of the publishers' demands, the latter would have few options to turn to. This dependency holds publishers in a constant economic headlock.

Dependency is the most problematic side-effect of third party rule. By leaning on parties like Amazon and Kobo, the publishers' drive to innovate has decreased. As understandable as that might be, it has limited their agency in their own field.

However, there are two sides to the equation. In 2011, before Amazon and Kobo had set foot in the Netherlands, Floor Schrijvers interviewed a selection of publishers about their perceived issues with e-book publishing. One of the respondents shiftily said: 'Publishers are not engineers.'<sup>43</sup> The sentiment behind this is a major factor in the popularity of third parties in the e-book industry. Publishing generally is a conservative field. Arnaud Nourry, chief executive of the French mega publishing concern HachetteLivres, already admitted it in 2018 and he is by far not alone in the sea of consumers, authors and digital innovators who criticise the slow pace in which publishers have come to action in the digital age.<sup>44</sup>

The publishers' reservations are not unimaginable, though. Even if, hypothetically speaking, a publishing house or a collective of publishing houses had the means to create a functional e-reading service, the devices on which these services are to be used play a critical role. Both Kindle and Kobo's success on the e-book market is directly linked to their innovative attitude regarding e-readers. Now that the comfort of the built-in e-store has become the norm for digital readers, it seems unlikely they would return to a service that requires more effort. If a Dutch national e-reading service were to launch, it would require a system just as convenient.

According to Steve Kessel, who led the first team of the developers working on the Kindle, it took three and a half years of work before Amazon could present its first functional version of the device.<sup>45</sup> At the time, the company

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43 "Uitgevers zijn geen uitvinders." in F. Schrijvers. *Kalkoenen, profeten en uitvinders: Hoe reageren uitgevers op het e-book en hoe zijn de verschillende reacties te verklaren?* (University of Amsterdam: Master thesis, 2011).

44 A. Flood. "Ebooks are stupid", says head of one of world's biggest publishers", *The Guardian*. 20 February 2018. <https://www.theguardian.com/books/2018/feb/20/ebooks-are-stupid-hachette-livres-arnaud-nourry> (14 January 2020).

45 N. Karlinsky. 'The inside story of how the kindle was born.' *DayOne by Amazon*. 15 Novem-

already made a revenue of over 8.5 billion dollars a year, a revenue which has since then skyrocketed.<sup>46</sup> This shows that the Kindles required many resources to cover the costs of developing the smart lock-in system that they provide today.

Kobo has a comparable history. The timing was right: Amazon's success on the e-reader market was taking off, and its Canadian competitor had little trouble attracting investors to develop a Kobo e-reader.<sup>47</sup> Countless amounts of money, hours and technical expertise have been poured into these projects to turn them into user-friendly and functional systems. It would be an enormous challenge for Dutch publishers to live up to these services without contracting a third party, simply because they lack the technical and financial resources.

The European Geoblocking Regulation makes building up a national platform even more difficult. With this law, suppliers of e-books would be forced to invest in a transnational paying processor and distribution software.<sup>48</sup> Transnational retailers, on the other hand, had this covered before it was even required.

Altogether, it would be extremely costly and difficult to realise a Dutch e-book service. For publishers, whose incomes have only declined over the past decade, it does not seem attainable in the short run, but with the right investments, they might be able to regain some of their agency.

## 8 Conclusion

Third parties providing e-reading services are becoming increasingly dominant on the Dutch book market. Kobo and Amazon do bring publishers certain benefits. Over the past ten years or so, these international e-book retailers have taken the burden of the required technical innovations on their shoulders. Funding and resources have been invested in the development of functional

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ber 2017. <https://blog.aboutamazon.com/devices/the-inside-story-of-how-the-kindle-was-born> (14 January 2020).

46 'Annual Net Revenue from Amazon from 2004–2018'. *Statista*. January 2019. <https://www.statista.com/statistics/266282/annual-net-revenue-of-amazoncom/> (14 January 2020).

47 M. Kozłowski. 'The History of Kobo and how they changed the e-reader market.' *Good E Reader*. 7 August 2020. <https://goodereader.com/blog/electronic-readers/the-history-of-kobo-and-how-they-changed-the-e-reader-market> (13 January 2020).

48 M. Dessing. 'E-boekenmarkt heeft nog steeds grote potentie'. *Boekblad*. 7 July 2017. <https://boekblad.nl/Magazine/Artikel/e-boekenmarkt-heeft-nog-steeds-grote-potentie> (14 January 2020).

e-reading systems and devices, which has ultimately given an impulse to the e-book market. Without them, publishers would likely not have gotten their e-books assortment off the ground in the first place.

However, by leaving the technical side of e-reading to third party services, publishers have put themselves into a vulnerable position. They are becoming increasingly dependent on the whims of Kobo and Kindle. For now, both parties seem to have entered into reasonable contracts with Dutch publishers, but the retailers are powerful enough to make excessive demands if they want to, something that has been demonstrated by the American situation.

On top of that, the e-reading services, especially in subscription format, do not equal a reliable income. Authors will suffer from this and it might lead to a decrease in authors with the (economic) ability to publish their work via traditional publishers. This might cause more cultural homogeneity in the literary sphere and damage smaller publishing houses.

Still, it proves challenging to find a functional alternative to Kobo and Kindle. In the past, most digital readers had a negative attitude towards e-books, especially because the prices were higher than the perceived value of e-books and the services they could be read on were inefficient. If publishers are to invest in the development of a national e-reading service, the prices of the books sold there would likely have to make up for the investment. This probably means that Kobo and Kindle remain the more affordable option for consumers, which would restrict the popularity of the national alternative. If publishers decided to remove their collections from Kobo and Amazon, this could lead to an increase in piracy. It is also unlikely that readers who are already using a Kindle would transfer to another service due to Amazon's lock-in system.

In sum, if Dutch publishers want to gain some agency back, they would have to come up with an alternative that has prices that compare to the perceived value of e-books. Similarly, they should be able to offer a device that matches the user-friendliness of a specialised e-book retailer, which would require a long term and expensive investment. Still, it might be worth it, if it means protecting cultural diversity and limiting dependency on international retail giants. Publishers might just have to force themselves to become engineers.

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</chapter 8>

## Digitisation and Reading: What Do We Know, and What Do We Need to Know More About?

*Anne Mangen*

Digitisation is affecting our modes of reading in many ways. We probably read more than ever before, but we also read very differently than, say, a decade ago. Our reading environment is becoming increasingly diverse:

- written text is becoming less predominant as audiovisual modalities are on the rise: for instance, we “read” more audiobooks and less novels in the form of written texts;
- reading is becoming more ad-hoc and mobile: something that is being done in-between or also concurrently with other activities;
- in education, digital learning materials are increasingly replacing print.

At the same time, recent results from large-scale reading tests such as PISA (2019)<sup>1</sup> found that performance in reading had declined in a large number of countries, and also that leisure reading (of books) is in stark decline (also found in PIRLS 2016).<sup>2</sup>

In this article, I will reflect on some of these issues in light of what we know from empirical research on the effect of the interface of screens on reading.

We are in the midst of a massive digitisation process, which is rapidly changing our modes of reading in numerous ways. Whether we talk about reading in schools and at universities, or leisure reading, digital devices are becoming the standard reading medium, rather than print books. (For leisure reading, the popularity of audio books seems to have risen at an even steeper rate, but this type of reading falls outside the scope of the present article.)

Despite decades of reading research, much is still unknown about the impact of screen devices on cognitive, affective, and emotional aspects of reading. Experiments vary with respect to theoretical frameworks, methodologies and measures, which makes it difficult to compare findings. Moreover, scholars from various disciplines and paradigms do not necessarily agree on the defini-

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<sup>1</sup> Programme for International Student Assessment.

<sup>2</sup> Progress in International Reading Literacy Study.

tion of key terms such as “reading” and “digital reading”. A key tension in the field is between the understanding of a narrow and a broad conception of reading, where the definition of reading narrowly entails the reading of exclusively written text, whereas a broad understanding of reading includes engaging with semiotic modalities other than written text, such as sound, images/graphics and animation, as well as digital-only features such as hyperlinks and interactivity. Add to this complexity the fact that technological developments happen very quickly, with new digital devices, hardware and software (including those used for audiobooks) entering the market at an unprecedented rate. In comparison, it takes a long time—sometimes several years—to go from an experiment being designed and carried out, to the results being published and made available in a scientific journal. Hence, empirical research in this field may seem to be at a constant risk of becoming outdated almost before it is even started.

Nevertheless, there are so many studies available by now that we are beginning to see some trends that can be assumed to be less prone to obsolescence, at least when it comes to reading in the narrow sense of the term—viz., reading written texts. Notably, the recent emergence of meta-analyses—that is, studies that collect and synthesize results across a number of single, comparable experiments—allows us to paint a clearer picture of the effect of digitisation on reading, at least with respect to the reading of single texts. These meta-analyses—there are currently three<sup>3</sup>—indicate that there is a difference in comprehension when reading single, linear texts on paper versus on a screen (be it a laptop or a tablet). In light of recent results from large-scale reading assessments (e.g., PISA) as well as the abiding transition to digitizing textbooks and learning material in schools at all levels, it is about time we take stock: what do we know by now about the effects and implications of digitisation on reading? Is the print book important in the 21st century?

Digitization changes how we read and write, and in the process it also changes how we think. The increasing number of digital reading devices turns reading into an increasingly *diverse* activity. For adults as well as for younger readers, ad-hoc and intermittent reading is becoming the norm, whereas long-form, sustained reading of print texts—in the form of books—is in steady

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3 V. Clinton, ‘Reading from paper compared to screens: A systematic review and meta-analysis’, *Journal of Research in Reading*, 42 (2019). P. Delgado, C. Vargas, R. Ackerman & L. Salmeron, ‘Don’t throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’, *Educational Research Review*, 25 (2018). Y. Kong, Y.S. Seo & L. Zhai, ‘Comparison of reading performance on screen and on paper: A meta-analysis’, *Computers & Education*, 123 (2018).

decline.<sup>4</sup> For many people—and especially the younger generation—what is entailed in a day's reading activities is tantamount to what is spent on the cell phone, the tablet or the laptop, computer. Typically, in such contexts, "reading" refers to engaging with short multimedia messages, and not—or not so often—with longer texts consisting merely of written text. It often also entails some version of writing, texting, sharing and communicating snippets of information—as in social media of various kinds. Also, differently from what would typically be considered "reading" just a couple of decades ago—reading (on screens) today is usually done in-between or concurrently with other activities, and often also as we are on our way from one place to another. Hence, reading has become mobile—not only in the sense of taking place on a smart-phone, but also as an activity that is carried out when we ourselves are on the move.

Digital technologies are an integral part of our everyday life, and they are an obvious asset to many educational objectives. However, recent empirical research comparing text reading on paper and screens should give us reason to pause and reflect on the ways in which increasing digitisation may also come at a (cognitive) cost, and that there are qualities of print books that we may want to make an effort to preserve. Keeping in mind the above-mentioned tension between the understanding of a narrow and a broad definition of reading, there are many indications that reading single, linear, written texts—i.e., reading in the narrow sense—is on its way to becoming an endangered species. Judging from the findings of recent empirical research, such trends can have some negative implications that we should be aware of.

Almost thirty years ago, Dillon reviewed the existing research comparing reading on paper with reading on screens. Much has happened since then, both in terms of technological advancements as well as theoretical and methodological developments in the field. Whereas Dillon's main findings related to visual ergonomics and reading speed,<sup>5</sup> more recent empirical research has looked primarily at cognitive aspects such as recall, comprehension and meta-cognition. When it comes to the reading of single texts, we now have enough research

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4 N.S. Baron, *Words onscreen: the fate of reading in a digital world* (Oxford University Press, 2015). M. Kovač & A. van der Weel, 'Reading in a post-textual era', *First Monday*, 23 (2018). J.M. Twenge, G.N. Martin & B.H. Spitzberg, 'Trends in US Adolescents' media use, 1976–2016: The rise of digital media, the decline of TV, and the (near) demise of print', *Psychology of Popular Media Culture*, 8 (2019).

5 A. Dillon, 'Reading from paper versus screens: A critical review of the empirical literature', *Ergonomics*, 35 (1992).

to say with a fair amount of certainty that there is a difference between reading on paper and reading on screens with respect to reading comprehension. Three meta-analyses<sup>6</sup> and one literature review<sup>7</sup> have revealed what Delgado et al. called a *screen inferiority effect* regarding the reading comprehension of linear texts. While also statistically controlling for a publication bias, the most comprehensive of the meta-analyses comprises 54 studies ( $n = 171,055$  students) published between 2000 and 2017.<sup>8</sup> The findings favored paper over digital reading (Hedge's  $g = -0.21$  for between-participants designs;  $d_c = -0.21$  for within-participant designs) concerning the reading of informational—but not of narrative—texts. Moreover, results revealed that the superiority of paper-based reading had in fact *increased* rather than decreased during the period of 2000–2017, casting doubt on claims about so-called digital natives displaying superior performance on screen.

Delgado et al. offer two hypotheses to explain the screen inferiority: the Shallowing Hypothesis and the Metacognitive Deficit Hypothesis. The Shallowing Hypothesis is related to the fact that the more we read on screens, the more we acquire a reading habit of quick and shallow skimming and scanning of texts.<sup>9</sup> Eventually, this habit “bleeds over” to our modes of reading on paper as well.<sup>10</sup> Hence, the ability to engage deeply and thoroughly with textual material is being affected by the sheer amount of skimming and scanning that we do when reading on screens. This tendency is closely related to the Metacognitive Deficit Hypothesis, which refers to the ability to monitor and control one's own comprehension when reading.<sup>11</sup> As we are facing challenges mobilizing what Maryanne Wolf has termed *cognitive patience*,<sup>12</sup> which is required for engaging deeply with complex texts, we also seem to have difficulties with gauging and calibrating our own reading when done on screens. More specifically,

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6 Clinton, ‘Reading from paper compared to screens: A systematic review and meta-analysis’. Delgado et al., ‘Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’. Kong et al., ‘Comparison of reading performance on screen and on paper: A meta-analysis’.

7 L.M. Singer & P.A. Alexander, ‘Reading on paper and digitally: What the past decades of empirical research reveal’, *Review of educational research*, 87 (2017).

8 Delgado et al., ‘Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’.

9 Delgado et al., ‘Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’.

10 M. Wolf, *Reader, Come Home: The Reading Brain in a Digital World* (Harper, 2018).

11 Delgado et al., ‘Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’.

12 M. Wolf, *Reader, Come Home: The Reading Brain in a Digital World*.

empirical research has shown that we tend to overestimate our reading performance on screens, compared to paper. In a seminal study assessing the influence of text medium on metacognitive ability, university students worked with expository texts (1000–1200 words long) on paper and on screen and predicted how well they would perform on a subsequent comprehension task. Results showed superior performance in print when time was self-regulated. In addition, participants reading on screen were significantly more overconfident with respect to their subsequent performance compared to print readers.<sup>13</sup> More recently, impoverished meta-comprehension on screen has also been found among younger readers.<sup>14</sup>

Given that schools and universities in many cases continue to replace books and other print materials with digital resources, this is a development that needs to be monitored closely over the next few years. Both in school and outside of school, children are increasingly engaging with shorter snippets of multimedia and multimodal texts, rather than engaging with longer stretches of written text, either on paper or on screen. Why should we worry about such a development? Because long-form reading—specifically that of written text—is assumed to yield cognitive and socio-emotional benefits that may be unique, and that we may want to make an extra effort to preserve in a future which will be increasingly digitized.

As for the socio-emotional benefits, research has indicated positive associations between literary reading and social cognition.<sup>15</sup> Engaging with longer, more complex literary texts may hone interpersonal skills such as perspective taking and empathy, as literary fiction is replete with often complex models of the social world in which the reader can immerse. This immersive simulative experience may facilitate an understanding of others and of oneself, in the process augmenting readers' Theory of Mind.<sup>16</sup> In light of the notable decline in leisure (fiction) reading, we need to ask if such trends may have negative implications for the development of social cognition and interpersonal skills.

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13 R. Ackerman & M. Goldsmith, 'Metacognitive regulation of text learning: On screen versus on paper', *Journal of Experimental Psychology: Applied*, 17 (2011).

14 V. Halamish & E. Elbaz, 'Children's reading comprehension and metacomprehension on screen versus on paper', *Computers & Education*, 145 (2019).

15 D. Dodell-Feder & D.I. Tamir, 'Fiction reading has a small positive impact on social cognition: A meta-analysis', *Journal of Experimental Psychology: General*, 147 (2018). M.L. Mumper & R.J. Gerrig, 'Leisure reading and social cognition: A meta-analysis', *Psychology of Aesthetics, Creativity, and the Arts*, 11 (2017).

16 R.A. Mar & K. Oatley, 'The function of fiction is the abstraction and simulation of social experience', *Perspectives on psychological science*, 3 (2008). K. Oatley, K. 'Fiction: Simulation of social worlds', *Trends in cognitive sciences*, 20 (2016).



Moving to the cognitive benefits, an abundance of research shows that leisure reading of fiction predicts reading comprehension skills.<sup>17</sup> There is a wealth of research documenting the associations between longform book reading (i.e., the reading of narratives, typically in book form) and reading comprehension.<sup>18</sup> Including digital reading as a factor, a more recent longitudinal study found that the best readers read printed books frequently, while the poorest readers read little, but were frequent users of digital devices.<sup>19</sup> In the same vein, Duncan et al. found that traditional (print, book) reading predicts reading comprehension ability whereas digital reading does not.<sup>20</sup> Extending this line of research and using the PISA 2009 database with data on more than 250,000 teenagers from across 35 OECD countries, Jerrim and Moss found evidence that teenagers who spend more time reading, *fiction texts* in particular (typically novels and stories in books) have significantly stronger reading skills than peers who do not read—or read less—fiction. The authors call it the “fiction effect”, since no associations were found between the frequency of reading non-fiction, news, magazines or comics and reading skill.<sup>21</sup>

A recent longitudinal study from Finland corroborates these findings. Torppa et al. looked at associations between leisure reading (of books, magazines, newspapers, and digital reading) and reading skills of 2,525 students aged 7 to 16. They found that book reading in particular predicted better reading comprehension, whereas digital reading was negatively correlated with reading skills.<sup>22</sup> Hence, the role of longform reading of books continues to play an important role in the development of reading skills, whereas it seems reasonable to question the contributions of digital reading in this context.

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- 17 S.E. Mol & A.G. Bus, ‘To read or not to read: A meta-analysis of print exposure from infancy to early adulthood’, *Psychological Bulletin*, 137 (2011).
  - 18 A.E. Cunningham & K.E. Stanovich, ‘Early reading acquisition and its relation to reading experience and ability 10 years later’, *Developmental psychology*, 33 (1997). A.E. Cunningham & K.E. Stanovich, ‘What Reading Does for the Mind’, *Journal of Direct Instruction*, 1 (2001).
  - 19 M. Pfof, T. Dörfler & C. Artelt, ‘Students’ extracurricular reading behaviour and the development of vocabulary and reading comprehension’, *Learning and Individual Differences*, 26 (2013).
  - 20 L.G. Duncan, S.P. McGeown, Y.M. Griffiths, S.E. Stothard & A. Dobai, ‘Adolescent reading skill and engagement with digital literacies as predictors of reading comprehension’, *British Journal of Psychology*, 107 (2016).
  - 21 J. Jerrim & G. Moss, ‘The link between fiction and teenagers’ reading skills: International evidence from the OECD PISA study’, *British Educational Research Journal*, 45 (2019).
  - 22 M. Torppa, P. Niemi, K. Vasalampi, M.K. Lerkkanen, A. Tolvanen & A.M. Poikkeus, ‘Leisure reading (but not any kind) and reading comprehension support each other—A longitudinal study across grades 1 and 9’ *Child development* (Online first).

In light of such findings, results from recent large-scale reading assessments such as PISA are worthy of increased attention. In several countries, reading performance as measured in PISA has declined since 2009 (when reading was the main domain, like in 2018) and this decline is accompanied by a significant drop in the number of teenagers reporting that they enjoy reading for pleasure (OECD, 2019). Long-form reading of fiction (in particular, novels) is in steady decline, whereas reading short-form, multimodal and multimedia texts on screens, as in social media, is equally starkly increasing.

Digital technologies continue to offer unprecedented possibilities with respect to information access, personalization, and individual tailoring of teaching and learning. However, while certain cognitive skills such as spatial cognition and task switching may be enhanced, there is a cognitive cost to frequent digital technology use that is related to deep processing, mindfulness, critical thinking, imagination and reflection.<sup>23</sup> Development of such higher order skills require cognitive patience and the ability to persist in cognitively challenging tasks that require deep, sustained engagement, skills for which digital technologies have yet to show their suitability.

“Digital technologies are here to stay,” is an argument often heard when critical issues are raised concerning the adequacy and usefulness of laptops and tablets in schools. Without there being solid research backing such claims, digital technologies are often associated with “future skills” and innovative teaching and learning processes. There are certainly numerous advantages to digital learning material, and digital technologies have their obvious place in today’s classrooms. At the same time, we should remember that print books have proven strengths that may in fact become even more important as digitalisation continues to progress. There are qualities and affordances of paper and print that seem to better support sustained, long-form reading. Given the extremely important role that this type of reading in particular plays in the development of cognitive and socio-emotional skills, we may want to think twice about abandoning paper and print books in classrooms as well as in our own leisure reading.

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23 P.M. Greenfield, ‘Technology and informal education: What is taught, what is learned’, *Science*, 323 (2009).

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</chapter 9>

# Digital Learning Materials or Good Old Paper Books?

*Lesley Joy Rietvelt*

## 1 Introduction

Since the rise of personal electronic devices, such as smartphones and tablets, reading digital texts has become a daily activity for most of us. The past decade almost everyone, especially the younger generations, has been in possession of a smartphone and laptop. These devices are being used for reading blogs, the news, social media pages, receiving and sending messages, and the consumption of other digital texts or media. Digital text is not only read during our free time, but at our place of work and education as well. This article will focus on the effects of using digital texts and digital learning materials in an educational environment.

To discuss the effects of reading from screens with a focus on the educational environment, it is important to become aware of how digital text was introduced into our daily lives and how much time we spend reading digitally. Therefore, this article briefly discusses how digital text came into our daily lives and how many people are interacting with digital text on a daily basis.

Next to this, the article will focus on questions such as: What are the effects of reading from paper for studying? Is it to the students advantage to implement digital learning materials? These questions are all researched by scholars active in the social sciences and humanities. This body of research on the effects of reading from screens versus reading from paper will be discussed as well. Reading from screens and paper is compared to analyse the possible effects of reading digitally on, for example, the memory of students and the comprehension of the text. There are several different perspectives on reading digitally, mostly divided in positive, negative and neutral reactions. In this article these perspectives will be discussed. Next, the question whether students are better at mastering the given material after studying from paper or with digital technology will be answered.

## 2 Digital Texts and Learning Materials

With the rise of free digital libraries, the internet and electronic devices, people began reading digitally. Reading digitally started with a few events, such as the start of Project Gutenberg in 1971. Project Gutenberg was a digital library with digital books available from the public domain, such as classic novels. In the 90s the internet became accessible for consumers, free e-books became available and some daring publishers experimented with selling electronic books.<sup>1</sup> Next to this, during the 2000s and the 2010s electronic devices such as e-readers, smartphones, and tablets became available.<sup>2</sup> These devices made it possible for people to read electronic books, webpages and other digital texts on the go.

During the mid 90s, reading digital reached education. During the years after, computers, connected to the internet, became more widely available in schools and teachers were starting to experiment with digital materials. Universities started digitizing their collections and made more digital texts available to students.<sup>3</sup> Digital reading does not stop at novels from the public domain, or e-books sold through subscription such as Amazon's Kindle Unlimited. People are reading scholarly texts, digital materials are used in education and digital texts such as news articles on webpages, blogs and social media posts are read every day.

To further paint a picture of how we have been reading from screen and paper the past few years, it is interesting to review some statistical research on reading e-books. An example of such research is the quarterly consumer research of the KVB Boekwerk, a Dutch informative platform for everyone active in book trade. The platform is an initiative of the KVB, the Royal Association of the Book Trade in the Netherlands.<sup>4</sup> According to their survey of January 2019, 37 percent of the participants read e-books and 17 percent used to read e-books, but are now only reading from paper.<sup>5</sup> This means more than half of the participants have read e-books at some point.

However, reading e-books is not the only activity that requires reading from screens. As mentioned before, activities such as reading the news online, receiving and sending text messages, participating in social media and consuming other digital texts are also part of reading from screens. According to Water-

1 M. Lebert, *A Short History of EBooks* (Project Gutenberg, 2009), p. 4.

2 M. Lebert, *A Short History of EBooks* (Project Gutenberg, 2009), p. 27.

3 M. Lebert, *A Short History of EBooks* (Project Gutenberg, 2009), p. 60.

4 'Consumentenonderzoek', KVB Boekwerk, <https://www.kvbboekwerk.nl/consumentenonderzoek/consumentenonderzoek> (9 January 2020).

5 Meting 47 GfK voor KVB Boekwerk consumentenonderzoek (January 2019) slide 22.

loo, Wennekers and Wiegman Dutch people read one third of their total reading time from screens.<sup>6</sup> The increase of the reading time from screen goes hand in hand with the increase in the use of electronic devices. In 2006 only twelve percent of the Dutch people had a smartphone, whereas ten years later the percentage was 85. In 2016, almost eighty percent of the Dutch population owns a laptop, 58 percent owns a desktop computer, and 68 percent a tablet. Within the youngest generation which participated in the survey (12 to 25 years old), almost everyone owned a smartphone with the exception of two percent. Next to this, ninety percent or more of the people between the age of 25 and 65 owned smartphones.<sup>7</sup>

The rapid rise of mobile devices which are used for consuming media, together with digitization had an influence on the production, processing, and spread of information in the publishing business. Publishers found new ways to reach their audience, for example through online publication. Publications are now available on multiple platforms, online and offline.<sup>8</sup> The reading time on screens thus increased with the availability of (mobile) electronic devices and the increasing availability of digital texts produced by publishers and by ourselves.

The time spent on reading digital texts is not just our free time. Next to reading e-books on our summer holidays, we read from screens at work and school as well. During the late 90s researchers already advocated for more research and focus on topics such as the Web 2.0 and its use in the classroom, or the use of Web 2.0 by students in higher education. During this time a little over a third of public schools were connected to the internet. Ten years later, this percentage rose to a full hundred percent. Next to this, the number of instructional computers connected to the internet increased in schools.<sup>9</sup> Internet technologies are not only influencing the way children learn in and out of school. In higher education there is an increase in the use of digital learning technologies and academic services.<sup>10</sup> Next to providing learning technologies and materials

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6 S.F. Waterloo, A.M. Wennekers, and P.R. Wiegman, *Media:Tijd 2018* (Amsterdam/Den Haag: NOM, NLO, SKO, PMA en SCP: 2019).

7 A. Wennekers, F. Huysmans and J. de Haan, *LeesTijd: lezen in Nederland* (Den Haag: Sociaal en Cultureel Planbureau, 2018), p. 24.

8 A. Wennekers, F. Huysmans and J. de Haan, *LeesTijd: lezen in Nederland*, p. 25.

9 C. Greenhow, B. Robelia and J. Hughes, 'Learning, Teaching, and Scholarship in a Digital Age: Web 2.0 and Classroom Research—What Path Should We Take "Now"?', in: *Educational Researcher* 3, (2009), p. 246.

10 M. Cutajar, 'Teaching Using Digital Technologies: Transmission or Participation?', in: *Education Sciences* 9, no. 3 (2019), p. 1.

for students, there are also new materials and services available for academics.<sup>11</sup> Scholarship has changed under the influence of digitization as well. Universities and libraries are working on projects such as digitizing their collection.

This article will focus on reading from screens in the educational environment and the implementation of digital learning material and other services. There is plenty of research on reading digital texts in an educational environment. Some articles consist of the results of surveys and examination of children or adults and their reading habits. Research reports such as the PISA report on student assessment, can help us monitor the reading behavior of students. Next to surveys and examinations, there are also articles written from the perspective of the humanities. These articles are mostly written by scholars who advocate either for the implementation of digital learning materials and the use of e-books, or those who approach the subject with caution and stress the possible negative outcomes of implementing more digital learning materials. In the next part these different perspectives will be discussed. Before discussing these various perspectives on reading from screens in an educational environment, the hypothesis which was tested during this research will be discussed.

### 3 Hypothesis

As mentioned before, there are some scholars who approach the subject of digital reading in education with caution. This article is also written from a cautious perspective. It is important to study the different effects of reading from paper and screen, especially in the context of education and studying. As will be discussed next, the medium from which is being read can influence memory, immersion and the comprehension of a text.<sup>12</sup> The focus of the argument is on students, especially in higher education, and how they master the material differently depending on the medium used. In this article it will be argued that reading from paper will have positive effects on memory and comprehension, which are crucial for studying. Digital learning materials are not necessarily more effective for learning, and in some cases students will have a poorer understanding of the material when learning digital texts.

Scholars have researched the amount of time we spend reading digitally and analysed the impact of digital texts and learning materials. Scholars active within social studies have studied the amount of reading we do, digitally and

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11 C. Greenhow, B. Robelia and J. Hughes, 'Learning, Teaching, and Scholarship in a Digital Age', p. 252.

12 E-Read COST E-READ Stavanger Declaration Concerning the Future of Reading (2019).



on paper, the preferences we have and in some cases they assess our reading abilities. Scholars active within the humanities take these statistics and raise awareness for developments, ask questions about the impact of the statistics, and raise concerns about the future of digital reading and learning. In the next few paragraphs several researches, such as meta-analyses, will be discussed.

#### 4 Reading Comprehension

There have been several studies on the reading of digital and paper texts regarding memorizing texts, the differences between narrative and informational texts, the preferences of different age groups, and the comprehension of text. Studying the comprehension of digital versus paper text can be interesting when considering digital learning materials. The influence of the medium on reading comprehension is an important factor when educational institutions want to implement new learning strategies and materials to improve the results of the students. Greater comprehension of the given material results in better grades from students. Because of its importance in education, the subject of reading comprehension will be briefly discussed.

Delgado et al. have written a meta-analysis on different studies regarding the effects of the medium on reading comprehension. They conclude there is an advantage to reading from paper. Their analysis showed three significant results. First, “the paper-based reading advantage increased in time-constrained reading compared to self-paced reading.”<sup>13</sup> Next, the paper-based reading advantage was consistent when reading informational or a mix of informational and narrative texts. However, when reading narrative texts from paper there was no consistent advantage. The last result is that it is possible that paper-based reading has an increased advantage over years, meaning we do not simply get used to digital reading when we grow up with technology or are more familiar with the devices we use for reading.<sup>14</sup>

According to the analysis of Delgado et al., reading from a digital device may not be best suited for deep comprehension of the text and for learning in general. They conclude that providing students with paper material is the most effective way for the students to comprehend and study the text. They

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13 P. Delgado, C. Vargas, R. Ackerman, and L. Salmerón, ‘Don’t throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension’, in: *Educational Research Review* 25, (2018), p. 23.

14 P. Delgado, C. Vargas, R. Ackerman, and L. Salmerón, ‘Don’t throw away your printed books’, p. 23.

do recognize the appeal of digital devices and are aware of the “unavoidable inclusion of digital devices in our contemporary educational systems.” Thus, Delgado et al. advocate for a deeper understanding about developing effective digital learning materials and environments and training students to use these digital environments to their advantage.<sup>15</sup>

These conclusions are based on the statistics from different publications they have analyzed. From these statistics it is clear that there is a lower reading comprehension when reading from screens versus reading from paper. This result was consistent in various studies with different methodologies and theoretical frameworks. When there is time pressure, reading from paper has a clear advantage over reading from screen. Those who read digital text within a given time frame have a harder time comprehending the text than those who can read from paper. However, it is important to mention this only is the case when reading informational text. When one is reading a novel, there is little to no difference in the comprehension of a digital or paper text.<sup>16</sup>

Next to the meta-analysis of Delgado et al. which states a preference of reading from paper, there is research available with more mixed conclusions. An example of this is the analysis of Singer and Alexander. They note in their article “Reading Across Mediums: Effects of Reading Digital and Print Texts on Comprehension and Calibration” that they have found studies which indicate a digital advantage and studies which indicate a paper advantage when it comes to reading comprehension. Thus, not every survey concludes reading from paper is better suited for the comprehension of the text. For example, Singer and Alexander conclude the medium does not matter when students are required to understand the main idea of a text.<sup>17</sup>

## 5 Digital Natives

Singer and Alexander do not give a clear statement or advice on differences in reading comprehension between screen and paper compared to Delgado et al. However, they discuss an interesting point regarding the younger generation.

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15 P. Delgado, C. Vargas, R. Ackerman, and L. Salmerón, ‘Don’t throw away your printed books’, p. 33.

16 P. Delgado, C. Vargas, R. Ackerman, and L. Salmerón, ‘Don’t throw away your printed books’, p. 34.

17 L. Singer and P. Alexander, ‘Reading Across Mediums: Effects of Reading Digital and Print Texts on Comprehension and Calibration’, in: *The Journal of Experimental Education* 85, no. 1 (2017), p. 166.

According to their research, members of the younger generation, who identify themselves with the term 'digital natives', have a clear preference for reading digitally. Singer and Alexander note that the preference of the younger generation does not give us an indication of their performances with the medium. It seems that the digital natives do not necessarily perform better when using the digital medium, just because they prefer to do so. Next to this, Singer and Alexander note it is unclear how well aware digital natives are of their proficiency in using digital technology and of the possible affordances and disadvantages of reading digitally.<sup>18</sup>

In the article of Delgado et al., there is a statement made which is interesting to consider in the context of education and learning. They state in their own words that the concept of digital natives in all probability does not exist. For the eighteen years before the article was written, the inferiority of screens increased over time. This would then indicate that the generation which grew up with digital technology, the so-called digital natives, is not capable of reading digital text with the same level of comprehension as paper text. As the presence of technology increases, the inferiority of screens increases as well. Age does not influence how well someone can read digitally, and thus future generations will not necessarily be more capable of reading digitally because they grew up with the devices used for reading.<sup>19</sup> This implies that digital learning materials will not increase comprehension for those who are more used to technology than past generations.

## 6 Reading and Our Brain

Next to comprehension and preference, it is also interesting to consider how our brain deals with text. Studying the processes in the brain and how we write, read and memorize can give us insight in which learning strategies could be effective for students. In the chapter "Memory and the Reading Substrate" van der Weel discusses the close relationship between body and mind and the possibility of its influence on learning.<sup>20</sup>

When we are reading, we use a part of the brain that is used for identifying objects through vision. The brain regards letters as visual objects, because the brain has no other way of identifying letters. We are not born with a brain

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18 L. Singer and P. Alexander, 'Reading Across Mediums', pp. 165–166.

19 P. Delgado, et al., 'Don't throw away your printed books', p. 34.

20 A. van der Weel, 'Memory and the Reading Substrate', in: S. Groes (eds) *Memory in the Twenty-First Century* (Palgrave Macmillan, London: 2016), p. 126.

circuit used for reading, instead we create a new circuit based on the parts of the brain used for identifying objects. While reading, a path between different parts of the brain used for vision, speech and motor coordination.<sup>21</sup>

This would prove there is a relationship between movement and reading. Van der Weel mentions how not learning to write actual characters can influence our fluency of reading, according to Japanese research.<sup>22</sup> It could be that the physicality of paper text positively influences the way we process text, comprehend text and memorize its content. Digital text then is less suited for the way our brain reads.

According to Jabr in the article “The Reading Brain in the Digital Age: The Science of Paper versus Screens” we construct mental representations of the text. During this process we connect meaning and structure. We are creating mental maps of the text, or textual landscapes. When trying to recall a certain piece of information, often we recall the place of the information in the complete body of the text which helps us recall the information itself. We are capable of creating maps of paper books, since their physicality helps us create a landscape of the body of text. When reading a digital text, this is more difficult. The lack of physical pages, a visual of how far along you are in the text and other visual aids influence our ability to mentally map the text. Something as simple as turning a page of a book helps us memorize and connect with the text, which cannot be done as easily with digital text.<sup>23</sup> Navigating and memorizing a text are crucial activities for students, especially those in higher education. If our brain is effective in storing and recalling information because of reading from paper, paper learning materials would be more beneficial in education.

## 7 The Stavanger Declaration

The COST E-READ Stavanger declaration is a document created by a group of almost two hundred European scholars based on four years of research on the impact of digitisation on reading practices. In this declaration the main conclusions of that research are mentioned. According to the Stavanger declaration digital text can offer opportunities to alter the presentation of text to the preferences and needs of individuals. This means it could be possible to alter digital

21 F. Jabr, ‘The Reading Brain in the Digital Age: The Science of Paper versus Screens’, in: *Scientific American*, 11 April 2013, <https://www.scientificamerican.com/article/reading-paper-screens/> (15 January 2020).

22 A. van der Weel, ‘Memory and the Reading Substrate’, p. 126.

23 F. Jabr, ‘The Reading Brain in the Digital Age: The Science of Paper versus Screens’.

text in such a manner that it is easier to read for, for example, children with learning disabilities. However, the declaration also states that readers are often overconfident about their comprehension abilities when reading digitally compared to reading from paper. This leads to students who skim more, especially when there is time pressure. Even though digital learning environments can be altered to positively influence the comprehension of text, the habit of skimming digital text would then negatively influence the comprehension. Similar to the article of Delgado et al., the declaration states comprehension of paper text was higher when reading longer, informational text and no differences were observed when reading narrative text. Next to this, the concept of digital natives is also disproved.<sup>24</sup>

Other than listing the key findings of the research, there are also recommendations made. With a clear focus on education, the Stavanger declaration notes that it is important to investigate the conditions under which learning in general, and the comprehension of material is enhanced. It is also important to research strategies which can be taught to students for dealing with digital texts effectively. Then students would be able to master deep and higher-level reading of digital texts, making sure the gap between comprehension of digital and paper texts narrows. In general, it is recommended to have teachers and educators become aware of the consequences of implementing digital learning materials and to have them collaborate with technologists and psychologists to create improved digital learning environments which are suited for students. It is not effective to simply adopt digital learning materials because the technology is available to us. It is important that the material is created with the students and the information on brain activity and other subjects mentioned in mind. According to the declaration it is crucial that educators and developers of educational software are aware of and are using the research done on reading digitally.<sup>25</sup>

## 8 Conclusion

Nowadays, people are reading both narrative and informational texts from screens. Digital devices and digital texts have become part of our daily lives, even in education. Teachers are eager to introduce digital learning materials

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24 E-Read COST E-READ Stavanger Declaration Concerning the Future of Reading (2019), pp. 1–2.

25 E-Read COST E-READ Stavanger Declaration Concerning the Future of Reading (2019), p. 2.

and environments. It is also believed that digital natives, the younger generation who grows up with digital devices, benefit from digital learning environments since they would be capable of reading digitally. The opposite is true. Digital learning materials do not necessarily have a positive effect on mastering the material. In most cases, there is a clear advantage of reading from paper. Reading from paper tends to boost our memory, paper texts are easier to navigate and students master the material more effectively when studying from paper.

This advantage is not dependent on age, thus younger generations are not more sufficient in reading digitally per se. Younger generations do tend to be overconfident in their digital literacy skills, which can have a negative effect on studying. For example, students tend to skim the text and avoid deep reading which leads to a poorer understanding of the text. It is proven in several studies that students perform poorly when studying digital texts, especially when it comes to reading comprehension. Getting the main idea of a text, however, is possible both with the digital as the paper medium. Deep reading and a high level of understanding a text is achieved by reading from paper.

In the future it is important for educators and institutions to consider the effects of implementing digital learning environments. It is crucial to be aware and to take into consideration the research done on reading practices, how our brain deals with text and the consequences of digital materials used for studying. Schools should strive to implement digital learning materials which are created in such a way they are effective tools for students, and not because they are the newest technology available. In order to effectively support the development of successful digital learning materials, more research on how our brain deals with digital texts is necessary.

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</chapter 10>