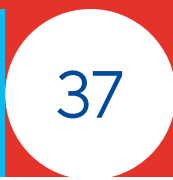
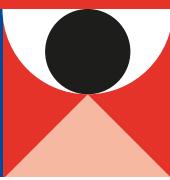
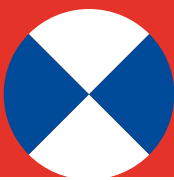


Digital lezen, andere lezen?

De technologische lees(r)evolutie
in empirisch perspectief

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Niels Bakker

(Stichting Lezen & Vrije Universiteit Amsterdam)

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SUMMARY (ENGLISH)

IS READING DIGITALLY READING DIFFERENTLY?: THE TECHNOLOGICAL READING (R)EVOLUTION FROM AN EMPIRICAL PERSPECTIVE

THE INFLUENCE OF DIGITAL MEDIA ON READING BOOKS

The introduction of digital media poses a challenge for those who promote reading: what relationship should they adopt to these media with regard to the promotion of reading books? There are both threats to and opportunities for their mission, which are relevant from the perspective of both the quantity and the quality of reading books. With regard to quantity, digital media, on the one hand, represent competition for books and the threat lies in the possibility that they could reinforce the decline in reading, which has been ongoing for decades. On the other hand, digital media extend the options and possibilities for reading books, as a result of which it is possible that the time spent reading could increase. From the perspective of quality, the threat lies in the possibility that in-depth, integrated reading will be lost: digital media seduce readers to read superficially and in a fragmented way, in part through hyperlinks in the text and other applications on the device. At the same time, both digital enrichment in e-books, such as animations and audio versions, offer opportunities to stimulate young readers, in particular, and e-readers are digital devices that possibly lend themselves, in particular, to deep reading.

The practical issue with regard to the promotion of reading can be traced back to the effect that new media technology, including digital media, has on human beings and society. According to the theory of technological determinism, new technology has an all-encompassing determining effect, in which the scope for human beings is limited. In contrast, technological humanism ascribes scope and control to human beings to implement the new technology according to their own wishes and insights. Technology directs human beings to a considerable extent in the one view, while in the other view human beings direct technology. Between these two extreme views nuanced positions, middle roads and connections are possible. These are introduced by, amongst others, soft determinism, which assumes that new technology has an effect in interaction with existing customs and forms of cognition, attitudes and behaviour, and the uses-and-gratifications theory, which posits that the effect of new technology occurs in interaction with the needs, wishes and preferences of people. Although empirical research cannot give conclusive answers to cause-and-effect relationships between new technology, on the one

hand, and human beings and society, on the other hand, it can give indicative answers, which can be interpreted in the light of the debate about the effect of new technology. This doctoral thesis aims to make such a contribution by answering the question how reading books changes under the influence of digital media.

Possible changes in the reading of books probably arise due to specific characteristics of the digital media, compared to printed media. The definition of medium specificity in this doctoral thesis is relative and gradual. This means that the medium-specific characteristics are *possible* for and not *essential* to the respective medium and, in addition, that differences between media, such as paper and digital media, are not *fundamental*, but rather *gradual* by nature. The characteristics regularly referred to in relation to digital media are the integration of various media contents, such as text and (moving) images, interactivity (whereby the user has considerable freedom of choice in how to use the medium), hypertextuality (whereby media contents are interrelated within a multi-linear network of connections), immersion (whereby the user undergoes a natural, organic experience, in which the boundary with the physical world blurs) and narrativity (which is strongly multilinear by nature). It is thought that the relationship between interactivity and immersion is problematic in the case of written stories and also possibly written texts more generally. Every time the user makes a choice, and interactivity occurs, the story stops and the immersion is interrupted. In addition, in the case of written stories, and possibly also in the case of written texts more generally, it is questionable whether multi-linear forms of narrativity can be experienced at all as pleasant by the reader-user.

TABLE 58 | CHARACTERISTICS OF READING MEDIA IN THE CASE OF BOOKS

	paper	e-reader	tablet	smartphone	laptop/pc
text surface (size and diagonal)	paper (medium, 8 to 12 inches)	e-ink (medium, 6 to 10 inches)	lcd (medium, 7 to 11 inches)	lcd (usually small, 4 to 6 inches)	lcd (large, 12 to 18 inches)
user options in the text	rustling, paging	typing, swiping, scrolling, clicking			
	use of page numbers, size and thickness of the book	use of page numbers, position of scrollbar, percentages, 'timer' with reading time			
	use of table of contents, index	use of table of contents, index (with hyperlinks to the respective parts), search function			
	text is stable relative to the page	adjustment of the font size and font type, changing the layout			
	images, pictures	multimedia, such as moving images, animated pictures and/or sound			
user options outside the text: offline	none, or using a different book and/or medium in addition	use of other texts, books	use of other texts, books, apps	use of other texts, books, software	
user options outside the text: online	none, or using a different additional (online) book and/or medium	none, or downloading and online use of other texts, books, apps	downloading and online use of other texts, books, apps	downloading and online use of other texts, books, software	

Adapted from *Leesmonitor – Het Magazine* (2016).

The printed book relates to digital media in two ways. In the first relationship, the digital version of the book is presented as an imitation of the printed version. Although the text carrier changes in this process, the text itself largely retains the form that it has on paper. At the same time, the digital version of the book promises to be an improvement, compared to the printed version, by offering additions, such as the option of changing the font size and font type. The second relationship involves new forms of reading and writing books and other texts. The so-called enriched e-books change the nature of the written text, for instance by making words and sentences move or by adding animated pictures. Digital books, both in the remediated and the enriched variants, possibly offer readers a different reading experience than the printed book. This is because the specific characteristics of the various reading media—this is in line with the idea of medium specificity—*possibly* and *gradually* differ from each other. These specific characteristics are described and elaborated in table 57.

In the five empirical part studies in chapters 2 up to and including 6 of this doctoral thesis, an attempt is made to answer the following two main questions:

– Are there differences between reading motivation, reading behaviour, the reading process, task-switching behaviour and the experience of reading when reading printed and digital books? If so, what differences are there?

– Are there differences between reading motivation, reading behaviour, the reading process, task-switching behaviour and the experience of reading when reading printed and digital books? Does the effect of these characteristics depend on the medium?

The ingredients of the research questions are discussed in a variety of ways in the five empirical studies and an attempt is made to find a substantiation for the following general hypothesis:

The reading of printed and digital books differs with regard to reading motivation, reading behaviour, the reading process, task-switching behaviour and the experience of reading, and the nature of these differences correlates to personal characteristics, such as generation, affinity with digital media and level of education.

The predicted correlation between the variables in the research questions is represented in the causal models in figures 21, 22 and 23. The arrows represent the effect that the independent variables have on the dependent variables, while the plus signs express a positive effect and the minus signs a negative effect.

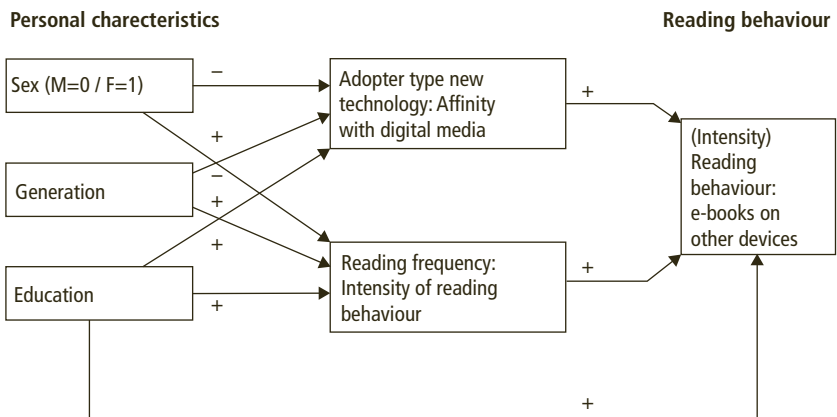


FIGURE 22 | CAUSAL MODEL OF PERSONAL CHARACTERISTICS AND READING BEHAVIOUR IN THE CASE OF E-BOOKS

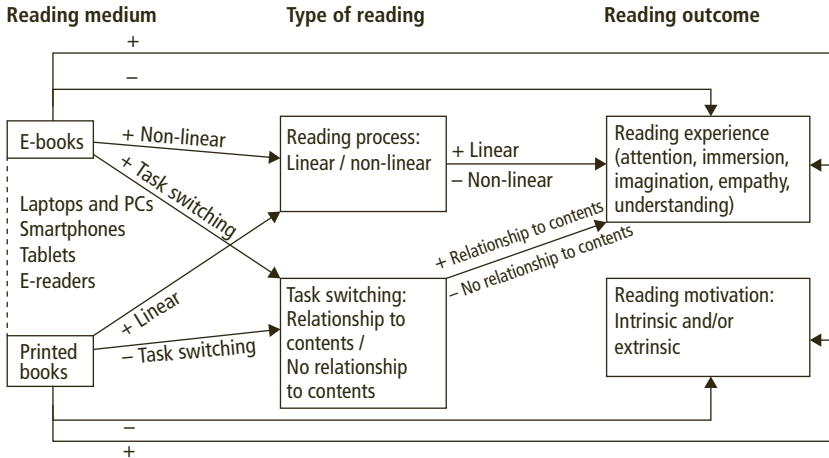


FIGURE 23 | CAUSAL MODEL OF READING MEDIUM, READING PROCESS AND TASK-SWITCHING BEHAVIOUR, AND THE EXPERIENCE OF READING AND READING MOTIVATION IN THE CASE OF REMEDIATED E-BOOKS

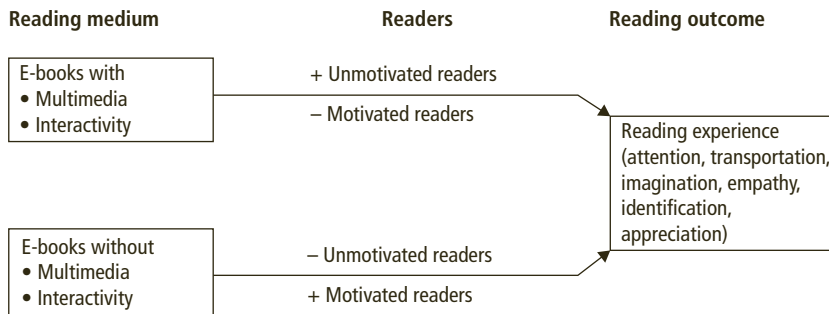


FIGURE 24 | CAUSAL MODEL OF THE READING MEDIUM, TYPE OF READER AND EXPERIENCE OF READING IN THE CASE OF ENHANCED E-BOOKS

The five empirical part studies were carried out using empirical research methods in a combination of questionnaire studies and (quasi-)experiments. The chapters 2, 3, and 4 report on the questionnaire studies into the reading behaviour in the case of e-books with a representativeness that lies within the measurements of Stichting Marktonderzoek Boekenvak (a foundation that carries out market research into the book publishing industry). Chapters 5 and 6 report respectively on the quasi-experiment into free reading at a secondary school using a tablet and/or paper and an experiment and replication involving the reading of a young-adult novel,

enriched with interactivity and multimedia. The questionnaires relate to residents of the Netherlands of 14 years and older, while the (quasi-)experiments were carried out amongst first-form pupils and students in higher education respectively. The questionnaires exposed relationships that were by nature correlations, while the (quasi-) experiments to some extent also make it possible to make statements about causality. The questionnaires were completed in 2012 (chapter 2) and 2016 (chapters 3 and 4) respectively and the latter builds on the former. The results of the five empirical part studies are summarised together, namely chapters 2, 3 and 4, and chapters 5 and 6 respectively.

PERSONAL CHARACTERISTICS AND READING BEHAVIOUR IN THE CASE OF E-BOOKS (RESEARCH QUESTION 1 AND CAUSAL MODEL 1)

The questionnaire studies of 2012 in chapter 2 and from 2016 in chapter 3 both find evidence suggesting the prediction in the causal model in figure 21. It appears that reading behaviour in the case of e-books can be explained by both affinity with digital media and reading behaviour when reading books, both paper and digital books, as a result of which the direction of both of these effects is positive. It appears from the study of 2016, in relation to the intensity of reading behaviour in the case of e-books, that both a strong and a weak affinity with digital media has a positive effect. Reading printed and digital books alongside each other appears to occur where there is strong intensity in reading behaviour when reading books. This relationship in relation to the reading of e-books, compared to printed books, tends more strongly towards e-books as the affinity with digital media increases.

The affinity with digital media and reading behaviour when reading books in turn can be explained by sex, generation and level of education, whereby the direction of these effects diverges per variable. The affinity with digital media is less strong and reading behaviour when reading books is more intense in the case of older generations. While men feel a stronger affinity to digital media, women tend to read books with greater intensity. The level of education has a positive effect on both the affinity with digital media and the intensity of reading behaviour when reading books. In chapter 2, support is found for affinity with digital media and reading behaviour when reading books, as mediating variables between sex, generation and level of education and reading behaviour when reading e-books. Contrary to what was predicted, chapter 3 showed direct effects of sex and generation on reading behaviour when reading e-books, while this was only the case in chapter 2 in the mediation analysis. The probability of occasionally reading an e-book is greater in the case of younger generations, while the probability that

this will be done with greater intensity is greater in the case of older generations. Women appear to be overrepresented amongst the readers of e-books and also read e-books with greater intensity. One difference between the two chapters relates to the level of education, which was positive in the study of 2012, while this was only the case in the study of 2016 for people 34 years and older.

Within reading behaviour when reading e-books, there are differences between digital reading devices with regard to the effect of personal characteristics. The use of e-readers, in particular, can be explained by intense reading behaviour when reading books, generation (where the caesura in the study of 2016 was approximately 50 years and older) and sex (women as fervent users). In the study of 2016, it appeared that the reading behaviour when reading books was only a positive predictor if other devices were used alongside the e-reader for reading e-books. In addition, affinity with digital media in this study, contrary to what was predicted, has a positive effect on the use of e-readers.

The use of tablets and smartphones can be explained, in particular, by a strong affinity with digital media. Above all, this appears to be the case mainly if the devices are used in combination with other devices. Generation also has a negative effect, whereby the caesura in the case of smartphones was approximately 50 years and younger in the study of 2016. In the study of 2012, men are the most fervent users of tablets, while in the study of 2016 level of education had a positive effect on the use of smartphones for reading e-books. The outcomes of both studies are mixed in the case of laptops, whether or not in combination with a personal computer. It appears that the use of these devices for reading e-books can be explained by generation and sex, with overrepresentation of younger people and men.

READING PROCESS, TASK-SWITCHING BEHAVIOUR, READING EXPERIENCE AND READING MOTIVATION IN THE CASE OF REMEDIATED E-BOOKS (RESEARCH QUESTION 2 AND CAUSAL MODEL 2)

The questionnaire studies of 2012 in chapter 2 and of 2016 in chapter 4 both find convincing evidence for the prediction in the causal model in figure 22. It appears that the reading medium with its specific characteristics predicts the reading process and the task-switching behaviour. E-books result gradually in a less linear and more non-linear reading process than printed books, and also more often result in task switching to contents both with and without a relationship to the text. Task switching was only examined in the study of 2016 as a separate independent

variable. The reading experience can then partly be predicted by the task-switching behaviour. Task switching to contents without a relationship to the text leads to a relatively unpleasant and suboptimal reading experience, while task switching to contents with a relationship to the text leads to a relatively pleasant and optimal reading experience.

There are differences amongst e-books across digital reading devices with regard to their effect on the reading process, task-switching behaviour and the reading experience. It appears that e-readers approximate to the printed book most closely, in the sense that the reading process is linear and non-linear to almost the same degree and relatively little task switching occurs. As a result of this, the reading experience of these devices is almost as pleasant and optimal as that of printed books. In this regard, e-readers are followed in order of appreciation by tablets, smartphones (in chapter 4) and laptops (in chapter 2) or laptops/pcs (in chapter 4). These devices generally result in a relatively unpleasant and suboptimal reading experience compared to paper, due to the non-linear reading process and task-switching behaviour to contents unrelated to the text.

The quasi-experiment in chapter 5 finds no support for the prediction in the causal model in figure 22. The use of tablets for free reading at secondary school has an effect on, both intrinsic and extrinsic, reading motivation that is as strong as the use of printed books. According to this study, there is also no difference in reading experience between free reading from a tablet and from paper. This outcome differs from that of chapter 2 and 4, where tablets resulted in a less pleasant and suboptimal reading experience compared to printed books. This is possibly due to the fact that pupils in the quasi-experiment were supervised with regard to task switching, as a result of which they mainly read in a linear fashion and in addition mainly task switched to related contents.

READING EXPERIENCE IN THE CASE OF ENRICHED E-BOOKS (RESEARCH QUESTION 2 AND CAUSAL MODEL 3)

The experiment and the replication in chapter 6 find limited evidence in favour of the prediction in the causal model in figure 23. The experiment shows that the digital enrichments reinforce mental visualisation in the case of less motivated readers, while they weaken that of motivated readers. It emerges from the replication study that e-books with interactivity and multimedia have a positive effect on empathy with the story, but contrary to the prediction there is no difference between motivated and unmotivated readers.

REFLECTION ON THE HYPOTHESIS AND IMPLICATIONS FOR PROMOTING READING

The outcomes of the five empirical part studies in chapters 2 up to and including 6 offer support for the hypothesis that new, digital technology affects the way people feel, observe, think and behave with regard to reading books. It is possible to make statements in relation to each of the three components of the hypothesis:

- the differences found between digital reading devices and printed books illustrate that the specific characteristics of reading media have an effect;
- the role that reading behaviour when reading books plays in reading behaviour when reading e-books implies that the existing forms of cognition, attitude and behaviour when reading books has an effect on reading behaviour when reading e-books;
- the effects of personal characteristics on reading behaviour when reading e-books implies that the needs, wishes and preferences of people have an effect.

The doctoral thesis therefore does not offer support for the most extreme theories of technological determinism and technological humanism, but rather for a nuanced approach, a middle road and the connections that soft determinism and the uses and gratifications theory provide.

For those who promote reading, the arrival of e-books and the various digital reading devices presents both threats to and opportunities for stimulating the reading of books. From the perspective of quantity, e-books may indeed cause the decline in reading to continue. E-books have been embraced to a considerable degree by existing groups of readers of books, such as women and elderly people. The extent to which new groups of readers arise is limited and reading behaviour when reading books will fade further as a result with the passing of the generations. The effect that affinity with digital media has on reading behaviour when reading e-books is an opportunity that counteracts this threat. Being at the forefront of new technology can therefore offer a way of stimulating the reading of books. From the perspective of quality, non-linear reading and more frequent task switching to unrelated contents is a threat, while more frequent task switching to related contents offers an opportunity for in-depth, integrated reading. Promoters of reading can actively and consciously stimulate task switching to related contents when reading books. The differences found between digital reading devices are overwhelmingly a threat to deep reading with regard to tablets, smartphones and laptops/pcs, and an opportunity with regard to the use of e-readers. With regard to e-books, it seems advisable that promoters of reading take into account the different digital devices and their specific characteristics.

De opkomst van schermmedia heeft ingrijpende gevolgen voor het lezen. Behalve dat digitale apparaten concurreren om de schaarse vrije tijd, brengen ze ook risico's met zich mee voor de kwaliteit van het lezen. Cultuurcritici en wetenschappers waarschuwen dat de aandachtsspanne krimpt. Waar mensen teksten voorheen diepgaand doorgrondde, gebeurt dit tegenwoordig steeds vaker non-lineair, gefragmenteerd, vluchtig en oppervlakkig.

Deze publicatie bevat een proefschrift dat dergelijke aannames van empirische evidentie heeft willen voorzien. Dit gebeurt door papieren en digitale boeken in verschillende studies met elkaar te vergelijken. Digitale apparaten blijken, in vergelijking tot papier, inderdaad te leiden tot minder lineair lezen, meer taskswitchen tijdens het lezen en een minder prettige en optimale leeservaring. Er zijn ook lichtpunten. De e-reader blijkt binnen het landschap van digitale apparaten een positieve uitzondering. Hiernaast maakt het nogal uit hoe mensen taskswitchen. Als zij het lezen afwisselen met activiteiten die inhoudelijk gerelateerd zijn aan de tekst, bevordert dit het diepgaande lezen.

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