

The Effect of The Reading Medium on The Way Readers Think

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Abstract. As more and more people have begun to read articles on new media platforms using cell phones, tablets, and e-readers, e-reading has become a major feature of communication in contemporary society. In this context, it is important to understand how different modes of reading influence readers' thinking and opinions. This paper summarizes the advantages of reading in different media, explores the impact of the reading media on readers' thinking, and concludes that e-reading favors the development of divergent thinking over convergent thinking. People who are accustomed to e-reading are more likely to develop affirmative thinking rather than negative thinking. Finally, digital reading increases confirmation thinking and decreases independent thinking. This study suggests that readers should develop an integrated approach to reading and that readers of different ages should develop their reading structures. At the same time, the algorithms of big data need to be adjusted according to the usage to help people better reading.

Keywords: Media; e-reading, thinking; reading.

1. Introduction

In 1995, Bill Gates believed that in 20 years, paper publication would disappear, and at the same time, people would no longer use paper to work or read. Instead, people will be able to enter electronic libraries with a computer to access all the information they need. In 1971, Michael Hart proposed the Gutenberg Project, which converted a part of literary works into e-book content through scanning. After that, human beings rapidly entered the new media era, the second media era [1]. Until today, although paper publishing has not disappeared, more and more people choose to use cell phones, tablets, and e-readers to read articles on new media platforms such as Facebook, WeChat, and Weibo. According to the Twentieth National Reading Survey Report released by the China Press and Publication Institute, in 2022, the comprehensive reading rate of Chinese nationals was 81.8%. The increase in the rate of digital reading was slightly higher than the rate of paper books, and 77.8% of adult nationals read through cell phones [2]. It is shown that the number of e-readers has exceeded the number of paper readers. E-reading has become a major feature of communication in contemporary society.

Carr mentioned that when humans begin to use smart technologies, they will be influenced by the technology to a certain degree and own the capabilities of these technologies [3]. As humans invent technology, they are shaped by it at the same time. Reading tools, such as language and reading media have a similar effect on humans. Chinese speakers and English speakers show different brain circuits, similarly, e-readers and paper readers show different ways of thinking. Therefore, it is important to understand how different reading mediums affect readers' way of thinking and give constructive suggestions. This paper analyzes the advantages of different reading mediums, and then explores the effects of paper and e-reading on thinking in terms of divergent and focused thinking, certainty and negativity, conformity, and independence.

2. Comparison of the Advantages of Different Reading Mediums

2.1. The Advantages of e-Reading

2.1.1 Reduce the constraints of reading.

Electronic media reduce the time and space constraints of reading. The first reason is that the portability of electronic devices, such as cell phones, tablets, or e-readers, makes reading possible at any time [4]. At the same time, the multimedia features of electronic media also make reading easier. For example, the ability of reading software to adjust font size is suitable for the aged, and the ability to convert text to audio makes reading possible for people with disabilities.

Moreover, the rich knowledge sources of e-reading reduce the content constraints of reading. With electronic devices, people can easily browse content in various fields, broadening the width of knowledge. At the same time, some web articles contain hyperlinks, and some reading platforms will recommend related articles to readers. These functions help readers to better delve into specific areas, increasing the depth of their knowledge.

2.1.2 Facilitate knowledge to spread.

The spread of knowledge is aided by the characteristics of e-books. In terms of access, many e-readers are available at low cost or even free of charge. For example, various universities have online libraries for students to access for free and review literature. The NSF Basic Research Knowledge Base provides NSF-funded papers to the public. WeChat and Weibo push articles from the users they follow every day. Some reading software, such as NetEase Cloud Reader, allows users to convert participation such as logins and reading hours into points to purchase reading content.

As for content organization, e-media offers convenient functions. Through professional knowledge management tools, users can sort their knowledge personally. For example, Douban Reading has a note-taking function, encouraging users to take notes in the process of reading. Drawing mind maps with software such as Mind Map helps readers to organize, reorganize, and innovate the fragmented information obtained in the process of e-reading, laying the foundation for disciplinary crossover.

2.1.3 Facilitate the generation of interactions.

Through the electronic medium, readers are allowed to interact with authors, as well as to form reading circles on social platforms to communicate with other readers, promoting in-depth learning and innovation. Today, most traditional writers have their own social media accounts, and through private messaging, readers can express their insights and confusions directly to well-known authors and receive a reply from the authors, realizing two-way communication. For new media creators, it is even easier to interact with readers. It is common for readers to interact with authors in the comments section. For online novels, sometimes readers even offer suggestions and indirectly participate in the creation of the story.

E-readings can be shared on social platforms, such as Instagram, and WeChat, with reading reflections, which is the transformation of an individual's transparent knowledge to expository knowledge, and at the same time the beginning of innovation [4]. By sharing reading reflections on social platforms, readers can form reading circles to communicate with others. Reading circles not only allow readers to share knowledge but also allow various points of view to collide, which leads to new inspiration [4].

2.2. The Advantages of Paper Reading

2.2.1 Tactile enjoyment

A significant portion of readers choose paper reading because of the anticipation of paper's touch, smell, and sight. On the one hand, paper books and magazines can bring pleasure to readers through the five senses during reading [4]. On the other hand, the design of covers and waistcovers and the choice of paper reflect the designer's understanding of the content. These designs can help readers form a general impression of the book before reading and create a sense of atmosphere for them while

reading. On the contrary, e-readers cannot do this. Moreover, reading articles printed on paper causes less eyeglass fatigue than radiation to the eyes from an electronic screen. Additionally, reading a paper book avoids the advertisements and social media alerts that appear on the screen during e-reading, thus reducing the possibility of distraction and improving the quality of thought.

2.2.2 Deepen thinking.

Compared to electronic media, paper media is more helpful to the reader's complete mastery of knowledge. This is because when reading paper books, it is more convenient to look up the content and cross-reference before and after than when reading electronic books, which is conducive to readers' deep understanding of the content. Additionally, paper books can be folded and annotated, which helps readers to read and think deeply [4]. Most importantly, e-readers are often distracted by advertisements or links that appear on the screen. Without such distractions, readers can more easily concentrate for long periods to think deeply when reading on paper.

3. The Impact of Different Reading Styles on Thinking

3.1. Effects on Convergent and Divergent Thinking

Convergent thinking is a method of thinking that gathers ideas from different sources to investigate the correct answer. Comparatively, divergent thinking is a diffuse mode of thinking that emphasizes producing diverse results from the source of knowledge. Convergent thinking is the foundation, and at the same time, the purpose of divergent thinking [5]. E-reading is conducive to the formation of divergent thinking and not conducive to the development of convergent thinking [5]. The reason is that hypertext in web articles directly connects articles and external links, making it easier for readers to shift their attention from the article to the outside. The change of focus causes readers to get lost in the reading process [5]. At the same time, new media platforms will continue to recommend content in related fields based on users' browsing records, likes, and retweets, which is conducive to broadening readers' knowledge rather than helping them to delve into a particular topic. Therefore, e-reading is conducive to the formation of divergent thinking and not conducive to the development of convergent thinking [5]. The way of thinking should be a combination of divergent thinking and convergent thinking. Divergent thinking can broaden readers' knowledge and promote the integration of ideas from different fields, while convergent thinking helps readers focus on a certain topic and have in-depth thinking. Therefore, it is important to improve the navigation function of e-reading to balance the readers' divergent thinking and convergent thinking and promote the development of readers' thinking.

3.2. Effects on Negative and Affirmative Thinking

Affirmative thinking refers to the tendency to think in agreement with things, phenomena, or reality. Conversely, negative thinking refers to the tendency to think in criticism of things, phenomena, or reality. E-reading provides knowledge from various sources, which is conducive to forming and developing affirmative thinking for readers [5]. However, at the same time, theoretically, e-reading can help readers develop negative thinking by providing them with different, or even opposing, views of an event, but it is not true. Under the influence of confirmation bias, when faced with a large amount of information, readers tend to favor the information that supports the viewpoints they already have. When reading, they will give more weight to evidence that proves their point of view and less weight to evidence that opposes their point of view [6]. In addition to information bias, a similar psychological phenomenon known as selective perception produces similar results. Under the influence of this psychological tendency, people are more likely to accept evidence that proves their initial positions while rejecting opposing views. This is because when readers are exposed to views that are different from the existing ones, the two views will collide and produce cognitive bias, which refers to an unpleasant psychological state due to conflicting cognition. To avoid such unpleasant feelings, people sometimes choose to discount, dismiss, or avoid conflicting information [6].

Therefore, faced with a large amount of information provided by e-reading, readers will choose to absorb the ones that are consistent with their original conceptions. In this case, the reader's original ideas are repeatedly reinforced, resulting in an echo chamber, which refers to environments in which the opinion about a topic gets reinforced due to repeated interactions with peers or sources having similar tendencies and attitudes [7]. It becomes increasingly impossible to doubt original ideas or to present opposing ideas. Thus, e-reading enhances the reader's affirmative thinking and reduces negative thinking.

3.3. Effects on Conformation Thinking and Independent Thinking

E-reading diminishes readers' independent thinking and enhances conformation thinking [8]. As for the selection of reading content, new media platforms will recommend new content around readers' areas of interest. To attract readers' attention, the platform will recommend quality content to readers. And when the platform selects quality content, the popularity of the content, such as the number of likes and retweets, often occupies an important position. As a result, e-readers are often recommended content that most people like. In that case, readers usually only notice the content that is popular with most people, and the content that is noticed by fewer people is hidden. What is more, the content recommended by new media platforms is based on what readers have read in the past, and they seldom recommend content from other areas that may interest them. As a result, readers' choices of what to read are limited, diminishing independence of thought.

4. Suggestion

4.1. Developing Integrated Reading Strategies: Combining e-Reading and Paper Reading

Sunstein points out that now, it is easier to gather a wide range of information and put it back together. However, how new technologies are used is crucial [7]. Thus, faced with two different options, paper reading, and e-reading, readers need to discover a way of reading that combines the strengths of both media.

The feature of rich sources of knowledge in e-reading can hinder readers from thinking deeply and from multiple perspectives on some issues, but at the same time, this feature is conducive to people's rapid access to a variety of knowledge, reorganization, and innovation of knowledge [4]. The source of knowledge of paper reading is relatively restricted, however, paper reading is conducive to people's concentration and in-depth thinking. To utilize the advantages of the two media, readers can adopt an integrated reading strategy. First, readers can learn about books they may be interested in on new media platforms and then do shallow reading through online resources. After determining their interest in the content, readers can purchase paper books for deep reading. Finally, readers can set up a reading circle on the online platform and exchange thinking and feelings to have a richer understanding of the content.

4.2. Readers of Different Ages Build a Reading Structure Suitable

Readers of different age stages should establish a reading system suitable for them by combining the characteristics of their age. For example, most of the post-2000s generation and post-2010s generation are developing learning habits and do not have good self-control [9]. Therefore, this group of people should focus on paper reading to develop the habit of concentration and build a good knowledge base [10]. The middle-aged group is busy with work and taking care of their families and often uses fragmented time to read instead of using a block of time. Therefore, the wise use of e-reading is important for them. Moreover, this group already has better self-control and understands their concerned areas. As a result, they are less likely to get lost in the mass of information provided by e-reading. Finally, the adjustable fonts and read-aloud features offered by e-reading platforms make reading possible for some older adults with vision loss. Moreover, e-reading makes it easier for seniors to engage with younger people and learn about issues of interest to them. Engaging in current social discussion is important to alleviate the isolation of elder people and to help society capitalize

on the wisdom of this population. However, some older people have become accustomed to reading on paper. Therefore, older persons can choose between e-reading and paper reading depending on their needs.

4.3. Optimizing Algorithms for Electronic Platforms

Although through algorithms, e-reading platforms can know readers' interests and recommend relevant content to enrich their knowledge, the information recommended by algorithms has certain limitations in terms of breadth and depth. Therefore, the platform should optimize the algorithm. First, the platform should expand the breadth of recommended content. The reading platform should not only recommend content in the field that readers are interested in, but sometimes it should also recommend content in fields related to this field. Occasionally, the platform can also recommend content in fields that readers do not often browse to help readers discover new points of interest. In those cases, readers are relatively less likely to be trapped in an information cocoon. In terms of depth, the platform can adjust the depth of recommended content according to the reader's understanding of the field. For example, when readers start to pay attention to a field, the platform can recommend relatively shallow content. After some time, the platform can recommend deeper content to the user to avoid them absorbing repetitive information.

5. Conclusions

This paper summarizes the advantages of e-reading and paper reading and analyzes the possible effects of different reading media on readers' thinking in three dimensions. E-reading favors the development of divergent thinking over convergent thinking. People who are accustomed to e-reading are more likely to develop affirmative thinking rather than negative thinking. Finally, digital reading increases confirmation thinking and decreases independent thinking. On top of that, this study suggests that readers combine e-reading and paper reading to establish an integrated strategy for reading. Moreover, readers of different ages should establish a reading structure that suits them. Figuring out how reading mediums affect thinking styles is the basis for developing a suitable reading style for oneself. This paper will help intellectual groups in the second media era to understand how their ways of thinking may be affected, to make rational adjustments to their reading styles, and to maximize the advantages of different media. Future research can explore the influence of reading styles on thinking in more dimensions and quantify the findings.

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