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READING LITERACY IN THE AGE OF DIGITAL TECHNOLOGIES[1]

OĽGA ZÁPOTOČNÁ

Abstract: The article outlines the basic contours of the current debate on literacy. Since the start of the millennium, the determining and dynamising factor in this debate has been information and communication technologies. The aim is to observe whether, and how, reading literacy, an important target category in education, is changing in this new reality. In the first part, the paper shows how the above questions are perceived and discussed in the field of relevant scientific disciplines from different points of view. In the second part, the research findings showing the risks and negative impacts of technologies are interpreted through the lenses of contemporary research on "new" literacy. Empirical research on specific aspects of online reading strategies and traditional print media reading are analysed and discussed in light of their contribution to reading literacy theory and education.

Key words: new literacy; reading online; metacognitive reading strategies.

Introduction

When a wave of prognoses on the future of human civilisation was unleashed at the turn of the millennium, information and communication technologies (ICT) were seen as being of crucial importance in all areas of life. The prospect of an information society became the leitmotif of education policy, and the focus point of strategic planning in a field of education. The European reference framework for education launched by the Council of Europe (Lisbon 2000) declared it as the need to define the basic new skills required for life in a globalised knowledge society. Regardless of the ideological background, and the numerous problematic aspects of creating the "key competencies" (Deakin-Crick, 2008; Rychen & Salganic, 2003), the ICT competencies found themselves at an appropriate position on the final list which was to become an important starting point in educational reforms. In the words of the European Commission (2006, p. 14), the 'basic skills of language, literacy, numeracy and in information and communication technologies (ICT)' have become the 'essential foundation for learning', 'learning to learn' and 'all learning activities'.

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"New literacy" in academic discourse

Understandably these prudent intentions did not simply appear within policy documents but were also the subject of numerous and intense academic debates. Primarily these concerned literacy theory and research, of which it was generally stated (for instance, by Taylor & Ward, 1998) that the digital revolution and the spread of the internet would lead to the need to reconstruct the concept of literacy and understanding of what being literate means in the ICT era, and how it can be achieved. New collocations and identifiers of literacy have begun to appear (*new, electronic, internet, "post-literacy"* etc.), and questions have arisen as to the nature, character and even substance of education. Although most of these concern social processes, changing social practices, and the environment within which meaning is socially created, exchanged, and shared (Barrel, 2000), attention has also been drawn to the cognitive processes used in the construction of meaning. The anticipated changes are mainly linked to the weakening of the "print-centric" conception of knowledge, to the emergence of new forms of text and multi-media genres, language and non-language forms of electronic communication, and also to the growing quantity of information and disinformation (see Zápotočná, 2004).

From a technological perspective, even more important were the debates that occurred in library and information sciences, within which the concept of *information literacy* is emerging, and which, under the influence of ICT, is continuing to expand. Since information literacy entered library terminology (introduced by P. Zurkowski in 1974), it has developed vigorously in the late 1980s/early 1990s, being enriched by concepts from the psychology of learning, thanks to the work of a number of well-known figures (such as P. Breivik, C. Bruce, & C.C. Kulthau, according to Marcum, 2002). Information literacy is being linked to conceptions of *resource-based learning*, *inquiry learning*, and *problem-based learning*. With technology entering this environment, a unique combination of determinants is emerging to develop the concept of information literacy for the new millennium. University and research libraries, including their associated organisations (IFLA, SCONUL, ACRL, and so on)[2], are the source of systematically developed models and standards of information literacy, which are generally linked to higher education, or, are for the exclusive use of those working with scientific information. In this context, information literacy is closer to academic literacy. On the other hand, there is a need for models that can be used at lower levels of education by a wider section of the general population. According to Farmer (2014) these could come from school libraries and he gives the example of the standards of the AASL model (2007[3]), which are comprehensive, based on multiple literacies, and focus more on cognitive and metacognitive processes and their development. Farmer states that when ACRL reviewed its information literacy standards, it drew upon several aspects of the AASL model including the developmental approach, inquiry-based learning, knowledge creation, incorporation of the affective domain, and social aspect of collaborative learning. The higher level cognitive skills and metacognitive aspects of information literacy form a core of several information literacy

[2] IFLA (International Federation for Library Association); SCONUL (Society of College, National and University Libraries, UK); ACRL (Association of College and Research Libraries)

[3] American Association of School Librarians (AASL, 2007) Standards for the 21st Century Learner

standards and the revised versions are published in the UK (ANCIL, SCONUL, see Martin, 2013). Nevertheless, it is obvious, that the library conceptions of information literacy above are far from complete; they are undergoing continual change and are the subject of discussion at the level of diverse, interrelated yet competing discourses (Pilerot & Lindberg, 2011).

Critical voices can be heard highlighting the risks of an excessive concentration on the processual side of information handling and on isolating decontextualised skills, whereby (according to Grafstein, 2002) the focus on the more substantial synthesis of information into knowledge structures is being lost. Everything points to the fact that it is not possible to develop these skills properly if there is no link to specific academic content and knowledge, or to maintaining continuity with the heritage of traditional reading literacy (see for instance Marcum, 2002; Hrdináková, 2007).

Parallel to what Grafstein has suggested is leading to a disjuncture between information and knowledge (p. 200) is the tendency to equate or conflate these two terms, which is manifest on various discursive levels. This is particularly so in the case of neoliberal discourse, which is openly promoted within the OECD as part of the reading literacy assessment projects (for example PISA or IALS). This has been the subject of fierce criticism from academics since international testing began (for instance, Hautecoeur, 2000)[4]. They point out that in defining the "new" literacy competencies emphasis is placed on dimensions that stem from the imperative of global capitalism rather than from other far more important dimensions (such as critical literacy). Roberts (2000) suggests that concepts such as knowledge are considered to be equivalent to, or conflated with, concepts such as information and skills. This reductive understanding of knowledge, and its commodification, is leading to a devaluing of knowledge ('defined using economic not human values...', p. 435), which contradicts the declared intentions and visions of a knowledge society.

Somewhere at the turn of the millennium, the technological and information boom took off including the mass informatisation of educational institutions and the emergence of online education. Slowly, but surely, there also occurred what some contemporaries have referred to as an 'epochal' (Coiro et al., 2008) or 'paradigmatic' change (Rankov, 2006) in the evolution of civilisation. And somewhere along the line there also emerged a certain degree of polarisation in opinion. The more conservative debates around new literacy and its numerous versions ("multi-literacies") tend to favour integrating technology into education as a natural part of learning, cognition, and literacy development, whilst maintaining their verified language and psychological basics, uncontested cultural values, and functions (Collin & Street, 2014). In addition, the limits of traditional forms or models of literacy and teaching are being considered and demands are being heard to enrich, expand, supplement or in some cases replace these with new competencies. This rhetoric, often brought to life by the education policy competencies "newspeak" mentioned above, comes in various shades of expertise, and when found in lay or populist discourse carries with it certain risks. The notion and claim that these are fundamentally different ways of thinking and comprehending in reading (Coiro, 2003) create the impression that traditional forms of literacy are disappearing,

[4] J. P. Hautecoeur was editor of the single-issue edition of *International Review of Education* (5/2000: Literacy in the age of information) in which experts on literacy theories and research responded to the OECD project and final report on IALS -1995.

or that the old ones are no longer required in this flood of new skills (Bauerlein, 2008; Lea & Jones, 2011), leading to an over-evaluation of the educational potential of technologies, or, vice versa, the under-evaluation of the difficult process of learning and the acquisition of real knowledge. Lea and Jones (2011), for instance, admit that technologies can transform the shape of literacy; however, that does not mean that they should, nor that it is unambiguously a good thing. Brian Street, a foremost representative of the sociocultural turn in literacy theory[5], compares the current obsession with technologies to the now superseded traditional model of literacy. He points to a number of parallels between the currently generated systems of various standards and skills and the old black-and-white view of literacy, and declares that both approaches are examples of technological determinism (Collin & Street, 2014). From the arguments he makes, though, it is clear that many of the enthusiastic visions defending the new literacy are, above all, evidence of a lack of deeper awareness and knowledge about the history of research performed on the old literacy.

What is new in the research on new literacy?

Fifteen years have now passed since the important shift in prognoses occurring with the arrival of the millennium, and during this time, we have seen not only technological change but also an extremely broad research agenda developing within ICT, particularly on the use of the internet as an information resource in education. As Kuiper et al. (2009, p. 669) note, it concerns 'research in various, mostly unconnected, bodies of literature, under different theoretical perspectives', so it is no wonder then, that in addition to the growing amount of research data, there are also great differences in the findings and in their interpretations.

In the next section of the article, we shall look at a selection of the research that directly or indirectly provides answers to questions relating to the fate of "old literacy", and its importance and role in the new one. We are interested in discovering what the real consequences of mass informatisation in education and literacy are and whether, and in what sense the essence of reading is changing under the influence of the technologies, and what the relationship is between new online reading and traditional print media reading. Is there a need to revise or reconstruct existing knowledge developed in the theories and research on reading, and if so, to what extent, and in what sense? Before we attempt to answer these questions, it is important to note that the following review covers a rather limited sample of the research available. We will consider a number of types of research and methodologies that may shed some light on contemporary debates and controversies concerning literacy in the age of digital technologies.

The risks and negative consequences of technology

Although in selecting the research we have attempted to proceed constructively and seek out an emerging consensus, and any positive signals or trends, we shall, nonetheless, begin

[5] This turn emerged in the mid-1980s as a response to the limited understanding of literacy as a purely individual cognitive activity or skill occurring outside the wider social, cultural and situational setting (see Zápotočná, 2004). B. Street subscribed to this new response in his *Literacy in Theory and Practice* (1984).

with the negative ones. The most obvious examples are two books that almost went on to become international bestsellers (Bauerlein, 2008; Spitzer, 2012). This success may partly be down to their "hard to miss titles" (*The Dumbest Generation: How the Digital Age Stupefies Young Americans and Jeopardizes Our Future* by M. Bauerlein; *Digitale demenz* by M. Spitzer).They may also have attracted attention because, although one author is European and the other American, they both concur that today's younger generation is becoming foolish. The two back up their arguments with a large amount of research (albeit of different kinds) and findings, which lead them to conclude that this happens because of information and communication technologies. Mark Bauerlein, a prominent pragmatic philosopher, documents this claim using the results of numerous surveys on general knowledge, high-stake testing, and evaluations which report a rapid decrease in the basic general knowledge amongst young Americans compared to the past. This paradox, in which, on the one hand, the current information era and the technologies provide previously unheard of conditions and opportunities to access and acquire knowledge, and, on the other, the fact that these opportunities are not being made use of (no generation 'has experienced so many technological enhancements and yielded so little mental progress', p. 40), can be explained by various so-called technological side effects. The first of these—the main sign accompanying digitalisation—is, Bauerlein argues, a deepening intergenerational isolation caused by the fact that young teenagers are almost constantly online, such that 'technology has contracted their horizon to themselves, to the social scene around them' (p. 19). He also blames technology for the fact that young people do not read books, and for the growing indifference or contempt in which reading is held. This trend affects all the socio-economic strata equally, regardless of their generally high level of technological skills or electronic literacy.

The reports from the second book (Spitzer, 2012) are just as catastrophic. The author is a doctor (who also studied psychology and philosophy) and he warns us against the **permanent consequences** of using technology: a decline in intellectual capabilities and brain function. In part this is a consequence of relying on and transferring mental work to external digital media, and hence a loss of motivation to store information in the memory. According to what we know about knowledge, and how it develops, an indifference to learning as remembering information reduces learning potential, and the potential for future independent mental activity (Spitzer, 2012, pp. 89-100). These issues are highly relevant to literacy and reading. After all, we know, and most of the more important empirically-based cognitive models of reading are in agreement on this, that basic general knowledge plays a decisive role in reading comprehension. If the information from texts is not linked to existing knowledge stored in the long-term memory, it is only processed superficially and stored short-term without it being understood more deeply (see Zápotočná, 2015).

Support for the negative impacts of ICT on reading is found in the arguments made in a European project, **COST**: Evolution of reading in the age of digitisation (E-Read, 2014, Action IS1404), which brings together European academics and experts on research into reading. In particular, they highlight negative changes in various cognitive and emotional aspects of online reading. They draw attention to the fact that interaction between the internet user and the text is shallow, random and often passive, which means that online reading is becoming increasingly superficial, disrupted, and fragmented, to the detriment of real

reading with in-depth understanding. This assessment therefore indicates that the visions mentioned above are partly correct; however, above all, they point out the need for further empirical research and a systematic, theoretical synthesis of knowledge on old and new research on reading.

Is reading on the internet reading?

We should not underestimate the above findings on the negative impact of technology, particularly given the size of the research samples on which it is based. Nonetheless, indirect conclusions like these, based simply on the availability and accessibility of technologies, and perhaps also frequency and intensity of use, are often criticised for being misleading (Lit, 2013). Deeper analyses investigating these relationships according to the type of activity the technology is being used for (which activities dominate, and so on) have produced more differentiated findings. This is partly allowed by PISA 2009 which focuses on reading literacy whilst monitoring information technology use amongst pupils, and in which the print version of the reading literacy assessment was expanded to include also online reading tasks. Much of the secondary analysis of PISA data (Farina et al., 2015; Gil-Flores et al., 2012; Lee & Wu, 2012) has shown that pupils' academic results and reading literacy (both print and online) correspond positively and are boosted only by the kinds of internet activity associated with information searches (in dictionaries, encyclopaedias and so on). When activities other than these are being carried out, the negative effects of ICT and their availability in the home environment prevail. However, not surprisingly, these kinds of activities featured far less in student behaviour than did social network type ones. A study by Farina et al. (2015), in which the authors analysed data from four countries, found differences depending on whether the technologies were being used in the home or school environment, and, specifically, that in relation to academic results only activities conducted at school were relevant, although this was not true in all countries. The effect of technologies on reading literacy thus depends on how, for what purpose, and for what activity the pupils are using them, and probably also the extent to how meaningfully these activities are regulated in school teaching practice. The effect of online reading and information searching is, to all accounts, positive, and this is true for both kinds of reading literacy (online and offline), which may indicate a mutual connection between them as two forms of the same kind of reading competence. However, according to the authors, confirming this requires more careful empirical research investigating the performance measures of all the indicators.

A review of the literature by E. Lit (2013) considering the issue of measuring internet skills (IS) in research conducted over the last decade looks at the evolving definition of this construct, and also the increasingly sophisticated methods used to measure and systematise both it and the findings. What is interesting from our perspective is, for example, the finding relating to age, where it is generally assumed that young people's greater competencies are a consequence of the growing digital divide. However, when looking at a wider spectrum of IS, it was shown that younger internet users are only better at some kinds of technical and technological skills, whilst older people generally have better strategical and information skills. The author puts this down to better traditional reading competency amongst the older generation. The ideas reflected in the popular terms "*digital natives*" and "*digital*

immigrants", introduced by Mark Prensky (2001a/b) in an attempt to explain the substantial difference between young and older ICT users, do not seem to be empirically supported. Prensky himself later (2009) admits that "although many have found the terms useful, as we move further into the 21st century when all will have grown up in the era of digital technology, the distinction between digital natives and immigrants will become less relevant" (p. 3). According to a study by Helsper and Eynon (2010), generation is only one of many predictors of advanced interaction with the internet, and breadth of use, experience, level of education may in some cases be more important than generational differences. Based on their research findings they suggest that it is possible for adults to become digital natives, especially in the area of learning.

However, there is no doubt the digital divide is growing in relation to socio-economic status and education. In both cases this is because of a lack of access to ICT at home and at school. The significant and worsening lag in relation to performance indicators in both literacies (old and new) found amongst pupils from lower socio-economic backgrounds has been documented by a number of studies (e.g., Leu et al., 2014).

Julie Coiro[6] (2003, 2011) has been researching the relationship between old and new literacies using performance parameters for traditional print and online reading in order to verify, consolidate and possibly revise current knowledge on reading. In the later of these two studies, a correlative and regressive analysis of the indicators of these two kinds of reading (amongst 7th grade students), she found a statistically significant relationship and overlap on the one hand, and fundamental differences and distinctions on the other. Coiro's findings indicate that online reading is fundamentally more complex; nevertheless, the specific and new strategies and activities it involves relate mainly to the seeking and localising information stage rather than the information processing stage. As far as the impact of existing knowledge is concerned, it was shown that this may be significant but only in respondents with a below-average level of online reading. According to the author, this indicates that good and effective search strategies may, to a certain extent, compensate for a lack of knowledge. The problem is—in this study as well—that where internet skills become the focal point of research, sophisticated instruments are used to measure them (Coiro, 2011, pp. 28-32). By contrast, reading literacy was only subjected to standard multiple choice comprehension testing, and existing knowledge was only measured indicatively. Many of the findings may therefore depend on the research methodology and the measuring tools used. Aware of this limitation, the author states that the traditional conception of reading may help shed light on the new online version, but does not do so to a sufficient degree. Nonetheless, although online reading requires the use of a wide spectrum of new strategies, it is important to see it as an extension to traditional conceptions of reading. She therefore tends towards the opinion that we need to move away from the original dichotomy between old and new literacies, and start looking at them as two parts of a single continuum, and this is true of both education and research (Moje, 2009).

[6] J. Coiro is frequently cited in relation to new literacy research and is one of the editors of an extensive publication, see Coiro et al. (2008).

Metacognitive strategies and online reading

Further parallels between old and new literacies are becoming visible as research favouring this kind of interpretation progresses. The conscious online reading strategies mentioned above and metacognitive processes as such have quickly proved to be crucial and have become the focus point in new literacy research just as they were in research on traditional reading. Qualitative research into the strategies employed by good internet readers also points to commonalities between proficient readers of traditional media and of online media, and specifically, to the tasks and stages in which their strategies intersect. Cho (2013) conducted an analysis of verbal reports supplemented by a recording of the online information behaviour of a group of high school students and identified the four most important groups of strategies; three of which were thought to be found in traditional offline reading as well. This is evidence, Cho suggests, of a necessary synergy between 'new and traditional reading strategies toward identifying useful texts, constructing meaning, and completing reading tasks' (p. 331). In relation to activity type, Zhang and Duke (2008) recorded the highest proportion of common reading strategies in online tasks aimed at knowledge acquisition and enrichment, and specifically during the intermediary stage of "in-site reading" (p. 148). In the 'evaluating content' phase, Madden et al. (2012) also recorded many advanced reading strategies and habits. Good adult internet readers were interested in, for instance, ascertaining authorship, the use of resources, and the quality and style of writing. An interesting finding in relation to resource credibility was the fact that participants ranked print media, books and academic journals as the most trustworthy resources. Anmarkrud et al. (2013) found that traditional offline reading strategies come into play most after the information searches are finished and that these positively affect the quality of the final piece of written output of the task. Last but not least, in the initial information search phase, choice of relevant keywords plays a particularly important role, which is a strategy based on prior knowledge (Zhang & Duke, 2008). Masson et al. (2010) state that regarding metacognitive engagement in online reading there are individual differences in the extent and level of strategy use, depending on motivation and need to find out or learn more, which positively correlates with results and efficacy of online learning. An important aspect of the above studies on metacognition in reading is that they take into account not only the type of reported strategy but also its importance and significance perceived and evaluated by experienced internet users. Strategies identified in this way provide a good starting point for further research on new and old literacies, as well as for their purposive acquisition in educational practice.

Intervention studies

The use of technology in education forms a chapter of its own in current research and cannot be explored in full here. Of the intervention research relevant to our own perspective, programmes to develop effective strategies of information behaviour certainly deserve attention. Insofar as effective online and offline reading strategies overlap in many ways, and share in common the function of active, conscious or metacognitive regulation of these processes, as the research mentioned above indicates, then, purposefully and explicitly developing them should be of equal benefit as it is in traditional reading (see Zápotočná,

2013). Indeed, the growing amount of evidence from research into teaching online strategies would suggest this intervention is effective (Salovaara, 2005; Kramarski & Feldman, 2000; Kymes, 2005; Afflerbach & Cho, 2010; Coiro, 2007). Another important type of intervention research uses various software applications and programmes to model collaborative activities and online discussions during learning activities and the studying of texts. The effectiveness of these kinds of programmes and their positive effect on reading comprehension and the critical evaluation of texts (Kuiper et al., 2009; Zheng & Warschauer, 2015; Mendenhall & Johnson, 2010; Kiili, 2012) again point to the importance of the social and socio-cultural dimension of reading and knowledge acquisition. In both these cases we can say that current research findings on ICT literacy are, to a marked extent, in line with existing knowledge on reading.

Conclusion

The aim of this paper was to ascertain what is new in the research on new literacy, and although that has not proved easy, we can summarize our findings below. It was not possible to establish unequivocally the positive and negative impacts of the expansion of ICT in today's information society. First of all, it depends on why ICT is being used. It would appear that simply accessing technologies may have serious negative consequences if they are being overused by young children not under adult supervision. Nevertheless, this could be perceived as a "side-effect" of ICT. When used meaningfully and purposefully, ICT has a mainly positive impact on reading literacy. By contrast, a lack of access to ICT, or the digital divide that widens in relation to poor socioeconomic background, may jeopardize the development of both the old and new literacy required to successfully cope with the requirements of today's information society.

As far as the differences between "old" and "new" kinds of reading are concerned, this research shows that specific reading strategies and activities are mainly used at the information search stage rather than at the online information processing stage. However, if the purpose of reading is primarily to do with cognition, learning and building new knowledge through reading comprehension, then there are no fundamental differences between the old and new kinds of reading. We should treat them as interconnected and complementary competencies that form a single continuum of the same reading literacy. In other words, no new kind of reading and literacy can do without the old one.

This was, partly, one of the aims of writing this article. To show and document, by giving examples of various kinds of empirical research, both what is changing under the influence of digital technologies and what remains the same. What is being retained on the psychological level of new literacy or reading? It seems that, thanks to current research into online reading, much of what we know is not only being confirmed once more but is also being made more visible. By means of this research, we also ultimately arrive at the issue of preventing some of the negative effects of the technologies, which should—particularly at the lower levels of schooling—primarily involve controlling the meaningful use of the technologies, whilst maintaining their value and developing key competencies in traditional reading and reading literacy. Last but not least, it is essential we remember that any research findings and seemingly answered or unresolved questions relating to the psychological

effects and educational consequences of information and communication technologies must be seen and interpreted in light of the research methodology and tools used to measure competencies of one sort or another.

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Institute for Research in Social Communication,
Slovak Academy of Sciences,
Dúbravská cesta 9,
841 04 Bratislava 4,
Slovakia

Faculty of Education,
Trnava University,
Priemyselná 4,
918 43 Trnava,
Slovakia
E-mail: Zapotocna@savba.sk